

Poster Presentations

Intermethod Comparison Of Allergen-Specific Immunoglobulin E Measurement

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Aim: A reliable assay for measuring allergen-specific immunoglobulin E (sIgE) concentration is extremely important because it provides information for accurate diagnosis of allergic disease. Therefore, the objective of this study was to compare two quantitative methods for specific IgE measurement, fluorescent enzyme immunoassay (FEIA) and chemiluminescent enzyme immunoassay (CLEIA) performed on UniCAP and IMMULITE 2000, respectively.

Materials and Methods: This study was performed at Srebrnjak Children's Hospital in Zagreb, Croatia. Concentration of sIgE d2 (*Dermatophagoides farinae* or house dust mite) and t4 (*Corylus avellana* or hazel) was measured. Firstly, routine serum samples collected in serum separator tubes were analyzed on UniCAP (Phadia AB, Uppsala, Sweden) which was considered as reference method. According to CLSI guideline, 40 residual samples for every allergen were selected for analysis on Immulite 2000 (Siemens Healthcare Diagnostics, Los Angeles, CA, USA). Selection of samples was made to ensure equal distribution among all 7 allergy classes: class 0 (<0.35 kU/L), class 1 (0.35-0.7 kU/L), class 2 (0.71-3.5 kU/L), class 3 (3.51-17.5 kU/L), class 4 (17.51-50 kU/L), class 5 (50.01-100 kU/L), class 6 (>100 kU/L). All samples were stored at 2-8°C and analyzed within 7 days according to the manufacturer recommendations. Passing-Bablok regression and Bland-Altman plot analysis were used to assess differences between two quantitative measurements. Kappa method agreement was used for inter-rate agreement between allergy classes.

Results: Results of Passing-Bablok regression equation for allergen d2 revealed that there is no proportional nor constant difference between methods ($y = 0.03(95\% \text{ CI}:-0.78 \text{ to } 0.55) + 0.97(95\% \text{ CI}:0.83 \text{ to } 1.11)x$). For allergen t4 there is a proportional difference ($y = -0.03(95\% \text{ CI} -0.27 \text{ to } 0.09) + 0.38(95\% \text{ CI}:0.24 \text{ to } 0.49)x$). Cusum test for linearity showed that there is no significant deviation from linearity for both allergens ($P=0.97$ for d2 and $P=0.80$ for t4). Bland-Altman plot showed a mean difference of 1.5 kU/L for d2 (+1.96SD was 24.7 kU/L and -1.96 SD was -21.7 kU/L) and 17.7 kU/L for t4 (+1.96SD was 62.2 kU/L and -1.96 SD was -26.8 kU/L). Differences between sIgE d2 concentrations measured on UniCAP and IMMULITE 2000 were uniformly dispersed within the range of the values measured on UniCAP (presented on the x-axis). Results for sIgE t4 show positive trend and regression line of the differences also detect a proportional difference. *Kappa* coefficient for inter-rater agreement between allergy classes was 0.74 (95% CI=0.64 to 0.83) for allergen d2 and 0.55 (95% CI=0.44 to 0.65) for allergen t4 what represents a good and moderate agreement, respectively.

Conclusion: The sIgE d2 measurement on the IMMULITE 2000 showed good agreement to the established UniCAP assay. In contrast, results of sIgE t4 obtained on two different platforms cannot be used interchangeably and results cannot be compared. Further clinical and analytical evaluation should be performed before replacing UniCAP with IMMULITE 2000 system for sIgE d2 and especially t4 measurement.

Keywords: allergen, immunoglobulin E, method comparison

Automation and Analytical Techniques

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P-002

Abstract Reference : 75

Review Of GGT Reference Intervals At Our Medical Laboratory

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Aim:Gamma-glutamyl transferase (GGT) is an enzymatic liver function test used as an indicator of alcohol ingestion, hepatic inflammation, fatty liver disease and hepatitis. At our laboratory, GGT is measured with an automated analyzer ADVIA 2400 Chemistry System (Siemens Healthiness). The medical technology company recommendations on reference intervals for GGT are: 2-30U/L for males and 1-24U/L for females. The aim of this study is to define the reference intervals for GGT in adult population at our health area.

Material and Methods:The samples were selected from apparently healthy people during the last two years from January 2016 to December 2017. The average age of this population was 48 years with an age range between 18 and 79 years.

Statistical analysis was performed with MedCalc v11.2. Variable distribution was studied through graphs and normality was tested with Kolmogorov-Smirnov. Consequently, the reference intervals and 95% confidence intervals were calculated using non parametric method (2.5th-97.5thpercentile). We used t-Student test to examine differences between men and women. A p-value<0.05 was considered significant.

Results:The results were as follows:GGT value for men: n=925; Minimum: 3U/L; Maximum: 81U/L; Median(CI90%): 22U/L(21-23); P2.5(CI90%): 9U/L(8-9); P97.5(CI90%): 66U/L(61-73).

GGT value for women: n=1331; Minimum: 1U/L; Maximum: 42U/L; Median(CI90%): 13U/L(12-13); P2.5(CI90%): 5U/L(5-6); P97.5(CI90%): 35U/L(34-38).

We observed higher concentrations for men than for women, with an average difference of 11.2U/L (p<0.0001). Therefore, reference intervals must be different for each gender. GGT men: 9-66U/L; GGT women: 5-35U/L.

Conclusion:We have established our own reference intervals for GGT through our own analytical method and population. As we can compare, these reference intervals are different between men and women, and are different from that described by the medical technology company. Therefore, our laboratory will proceed to its replacement.

Keywords : GGT, reference intervals, laboratory, value.

Automation and Analytical Techniques

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P-003

Abstract Reference: 98

Automated Measurement Of Erythrocyte Sedimentation Rate: Evaluation And Its Relation To Hematocrit And Fibrinogen

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Introduction: The aim of this study was to assess the analytical performances of the automated erythrocyte sedimentation rate (ESR) on iSED® (Alcor, Smithfield, USA). We compared results with the

standard Westergren method and examined the effect of the hematocrit (Htc) and fibrinogen level on both methods.

Materials and methods: iSED® is fully automated analyzer that performs ESR based on photometrical rheoscopy. The analyzer was assessed for imprecision and comparison with Westergren method. K₃EDTA (VACUETTE®, Greiner bio-one) samples were taken from 248 randomly selected inpatients in Sestre milosrdnice University Hospital Center. Parameters of CBC were determined on Backman Coulter DxH and fibrinogen on the BCSXP Siemens analyzers from Sodium-citrat (VACUETTE®, Greiner bio-one) samples. The results were compared using linear regression and Bland-Altman plot.

Results: The evaluation comprised within-run imprecision and repeatability for control samples with ESR values of 9 mm/h (CV: 3,8 % and 3,7%) and 64 mm/H (CV: 6,8 %, and 7,2% respectively) and method comparison ($\rho=0,86$; Passing-Bablok regression equation: $y=4,039 (3,00 \text{ to } 5,75)+0,94 (0,88 \text{ to } 1,00)x$; bias: 28,2%; mean difference 1,4 (95% limits of agreement -29,8 to 32,5)). CBC and fibrinogen were determined for every selected inpatient. Comparison of the method established that the methods are comparable: $y=1,25 (-3,23 \text{ to } 3,00)+1,25 (1,00 \text{ to } 1,82)x$; $\rho=0,771$; mean difference 2,3 (95% limits of agreement -11,7 to 16,4) if the level of fibrinogen is in the reference range ($<3,5 \text{ g/L}$), N=52. There is a statistically significant constant but not proportional difference in the results of the tested methods: $y=5,35 (2,53 \text{ to } 8,85)+0,96 (0,85 \text{ to } 1,07)x$; $\rho=0,827$; mean difference 2,6 (95% limits of agreement -32,2 to 37,4), in the sample group with fibrinogen values greater than the upper limit of the reference range ($>3,5 \text{ g/L}$), N=115. Also, the methods are comparable: $y=-2,6 (-12,9 \text{ to } 5,22)+0,93 (0,79 \text{ to } 1,13)x$; $\rho=0,766$; mean difference -6,4 (95% limits of agreement -47,3 to 34,4) if the Htc is lower than the lower limit of the reference range ($<0,356$) N=76, while there is a statistically significant constant difference $y =2,68 (0,69 \text{ to } 3,50)+1,07(1,00 \text{ to } 1,15)x$; $\rho=0,861$; mean difference 4,6 (95% limits of agreement -18,2 to 27,4) in the results of the tested group with Htc within reference range (0,356-0,530), N=168.

Conclusion: This automated method has many advantages: works directly from primary EDTA tubes, results in 20 seconds, fully automated, LIS connectivity and available commercial control but not reliable alternative for the ICSH approved standard Westergren method. Thus further studies and validation experiments would be required.

Keywords : ESR, iSED Alcor, Westergren, comparison, evaluation, fibrinogen, hematocrit

Automation and Analytical Techniques

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P-004

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Evaluation Of Mobile Phase Reuse In Vitamin D Measurement By High Performance Liquid Chromatography

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Aim: Nowadays vitamin D measurements can be done by immunoassay, High Performance Liquid Chromatography (HPLC) and mass spectrometry (MS) methods. HPLC methods can identify derivatives and forms of vitamin D. Although their routine use is complicated, the frequency of use is increasing steadily. The aim of our study is to evaluate whether the mobile phase can be reused in HPLC measurement of vitamin D.

Materials and Methods: Mobile phase reuse has been tested by different investigators many times with different methods and has achieved various results. Some laboratories developed a lab-sized distillation system and the recovered solvents gave identical chromatographic results and were highly pure according to GC-MS, UV, and Karl Fischer titration. SolventTrack is a solvent conservation system designed to

recycle uncontaminated solvents used in isocratic HPLC processes. SolventTrak automatically detects eluting peaks and diverts them to waste while sending the clean, uncontaminated solvent back to the reservoir for recycling. We didn't want to use this system to avoid high costs. Taking into consideration the conditions we are in, we investigated whether mobile phase recycling could be done, without extra equipment and similar costs.

Results: The mobile phase is classified as laboratory waste. Solvents constitute a major portion of a chemical laboratory's waste and cause immediate costs for proper disposal and reordering. Every kind of medical waste should be reduced for environmental health and cleanliness, therefore waste prevention should be a major concern in any laboratory. Although it seems that it is not possible to recycle in our method, every result will be meaningful significant.

Conclusions: Mobile phase recycling can reduce considerably the amount of chemical waste generated, and the amount of time and money spent on routine analyses, but its effects on analytical efficacy and sample quantification have not been thoroughly studied.

Keywords : High Performance Liquid Chromatography, Vitamin D, Mobile Phase Reuse, Recycle

Automation and Analytical Techniques

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P-005

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Performance Of Automated Urine Analyzers Using Flow Cytometric And Digital Image-Based Technology In Routine Urinalysis

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Objective: In recent years, automatized analyzers are introduced for improving reproducibility, accuracy, and decrease false positive results for urinalysis. The purpose of this study was to evaluate the analytical performance of Sysmex UF 5000 and Dirui FUS 200 and to compare the results with manual microscopy and between each other.

Methods: Two hundred fifty freshly collected urine samples were analyzed for evaluation. Mid-stream specimens were studied sequentially using the Dirui FUS 200 and Sysmex UF- 5000 urine analyzers, and also with manual microscopy within one hour. The physical and chemical components of urinalysis, and sediment results were investigated.

Results: The precision results of the FUS-200 and UF-5000 for WBCs, RBCs, and ECs were acceptable. The both analyzers demonstrated good linearity within the sample dilution range ($r > 0.97$), and no carry-over was found. The comparisons of the FUS-200 and the UF-5000 with manual microscopy for RBCs, WBCs, casts, crystals, and ECs on 250 samples exhibited good agreement with little bias ($R > 0.780$). Only, the moderate agreements were obtained for calcium oxalate for the FUS-200, and UF-5000 ($R = 0.512$, and 0.648 , respectively). The sensitivities of WBCs were 75.8% and 86.8%, with specificities of 86.8% and 87.8%, and the sensitivities of RBCs were 91.1%, and 84.4% with specificities of 82.2%, and 89.6% for the FUS-200, and UF-5000. Kappa values of the UF-5000 were higher than FUS-200 for WBCs, RBCs, ECs, and calcium oxalate.

Conclusion: The FUS-200 and UF-5000 urine analyzers, are both accurate, very precise systems and can be safely used in clinical laboratories with improved laboratory workflow, reduced visual inspection and accelerated turn around times.

Keywords : Automated Urinalysis, UF-5000, FUS-200, Urine microscopy, analytical performance

Validation Of The ^{51}Cr -EDTA Clearance Method For The Glomerular Filtration Rate Determination

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Aim: Glomerular filtration rate (GFR) is a commonly accepted indicator of kidney function. Estimated GFR is routinely calculated using plasma creatinine concentration, height and factor, but accurate GFR can only be measured using tracers that have no significant tubular secretion or reabsorption. The ^{51}Cr -chromium - ethylenediaminetetraacetic acid (^{51}Cr -EDTA) clearance method remains one of the most commonly used techniques to accurately determine GFR. The GFR method however is not commercially available and lacks an external quality assessment (EQA) scheme necessitating in-house assay development. Due to the nature of the radioactive tracer, variation in calculations and gamma counters used in different laboratories, this was an extremely challenging method to validate. The aim of our study was to validate the ^{51}Cr -EDTA clearance method for the GFR determination to fulfil ISO standard 15189 for UKAS accreditation of this method.

Materials and Methods: Repeatability, intermediate precision, linearity, measurement uncertainty, limit of blank, limit of detection and limit of quantification were all determined in at least two independent experiments (n=3-20). Linearity was assessed in a range of 10 cpm to 20,000 cpm. Theoretical decay of ^{51}Cr -EDTA samples was calculated using ^{51}Cr -EDTA half-life. To investigate the effects of haemolysis and volume displacement, we introduced haemolysed red blood cells (RBC) of 1-10 % to the samples.

Results: The routine parameters including repeatability, intermediate precision and linearity were all acceptable when using Wallac 1470 Wizard Gamma Counter. Measurement uncertainty was determined to be ≤ 7.0 % at low counts and ≤ 4.0 % at high counts. Effects of haemolysis on the patients' samples proved to be insignificant in this type of assay. Both re-count of samples and re-calculation of ^{51}Cr -EDTA clearance were performed by the Nuclear Medicine department at the University Hospital Birmingham (UHB) and calculated GFR values were comparable to those generated by our laboratory.

Conclusion: We have successfully validated ^{51}Cr -EDTA clearance method for GFR determination and continue to monitor our performance through the UHB collaboration. Currently awaiting UKAS accreditation.

Keywords : glomerular filtration rate, chromium EDTA clearance, validation

Acknowledgments : National School of Healthcare Science

Automation and Analytical Techniques

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P-008

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Development and Validation of an Ultra-Performance Liquid Chromatographic-Tandem Mass Spectrometry Method for Determination of Galactose-1-Phosphate Uridyltransferase Activity

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Aim: Galactosemia is an autosomal recessive inherited carbohydrate metabolic disorder resulting in a deficiency of enzymes involved in galactose metabolism: galactose-1-phosphate uridyltransferase (GALT), uridine diphosphate galactose 4-epimerase (GALE) and galactokinase (GALK). GALT deficiency referred to as classic galactosemia, is the most frequent cause of the disease encountered in the clinics, and nearly a complete deficiency of GALT enzyme (enzyme activity below 10%) is observed. Classic galactosemia is characterized by developmental retardation, jaundice, hepatic dysfunction and cataract in neonatal period. In this disorder, milk intake leads to increased galactose levels in blood and urine and also causes intracellular galactose-1-phosphate accumulation. With a galactose-free diet, acute complications may recover. However, late diagnosis or misdiagnosis may result in delayed intervention and may even lead to death. The gold standard for diagnosis of classic galactosemia is the determination of erythrocyte GALT enzyme activity level. Despite the fact that galactosemia screening is performed as one of the newborn screening tests in many countries in recent years, there is no routine screening practice in our country. The purpose of this study is the development and validation of an Ultra-Performance Liquid Chromatographic-Tandem Mass Spectrometry (UPLC-MS/MS) method for determination of Galactose-1-Phosphate Uridyltransferase activity.

Materials and Methods: The study first focused on organic solvent ratios in the solvent system, and also formic acid, ammonium formate concentrations for method optimization. We aimed to investigate effects, caused by the changes with these parameters on the analysis and studied the experimental techniques for optimization of the method. In the developed method, ACQUITY UPLC HSS-T3, 2.7 µm, 2,1 x 50 mm column was used as the stationary phase and 5 mM ammonium formate in acetonitrile/water 50/50% were used as the mobile phase. Injection volume was 5 µL while flow rate was 0.4 mL/minute. Mass spectrums were determined with Waters Xevo TQD MS/MS system.

Results: Retention times for ¹³C₆-UDPGalactose-1-Phosphate and UDP-N-Acetylglucosamine (IS) were both 0.27 minutes. The method was fully validated in terms of selectivity, limits of detection (*LOD*) and quantification (*LOQ*), linearity, matrix effect, precision and accuracy. The developed method was validated in erythrocyte hemolysate matrix with a 0.038 mM limit of detection. A linear response function was established for the range of concentrations between 0.1 – 100 mM ($R^2= 0.9981$) for ¹³C₆-UDPGalactose-1-Phosphate. The precision (%CV) and accuracy results of five validation batches with three different concentration levels were well within the acceptance limits of good laboratory practice standards and guidelines.

Conclusion: This fast, accurate, reliable and sensitive method to analyze GALT levels with LC-MS/MS system could contribute to facilitate a national newborn screening test for classic galactosemia in Turkey.

Keywords : Galactose-1-Phosphate Uridyltransferase, LC-MS/MS, classic galactosemia, method validation, rare diseases, newborn screening

Automation and Analytical Techniques

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P-009

Abstract Reference : 269

The Analytical Evaluation Of C-Reactive Protein, Procalcitonin, And D-dimer Chemiluminometric Assays By Maglumi 4000P

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Aim: Accurate and precise measurements of C-reactive protein (CRP), procalcitonin (PCT) and D-dimer are of significant importance in the emergency diagnosis. In the present study, we aimed to evaluate the performance of the Snibe Maglumi 4000P for C-reactive protein (CRP), procalcitonin (PCT) and D-dimer assays in comparison with Cobas (Roche), and BCS-XP (Siemens) autoanalyzers.

Material- Method: The study comprised of 50 patients who admitted to the Central Laboratory of Istanbul Faculty of Medicine. The CRP, and PCT and D-dimer results obtained using Maglumi 4000P were compared with the results of the same samples from Cobas c501 (Roche), e601 (Roche) and BCS-XP (Siemens), respectively, which are currently installed in our laboratory. The precision, linearity, carry-over and comparison studies were performed according to the Clinical Laboratory Standards Institute (CLSI) guidelines.

Results: The precision of CRP, PCT and D-dimer assays on Snibe Maglumi 4000P were between 0.8 to 5.5 %. Both analyzers demonstrated good linearity within the sample dilution range ($R^2 > 0.99$), and minimal carry-over for all parameters. The comparison of the Maglumi, Cobas and BCS-XP analyzers presented good correlation with little bias, and yielded the following results: for D-Dimer $y = -0.1192 + 1.0530x$, mean bias: 0.04; for PCT $y = -5.7826 + 1.3660x$, mean bias: -1.2; for CRP $y = 0.1937 + 0.69x$, mean bias: 9.6.

Conclusion: According to our results, the Maglumi 4000P is a quite precise and accurate system for CRP, PCT, and D-dimer measurements and can be used efficiently and safely in clinical laboratories.

Keywords : Maglumi 4000P, analytical performance, CRP, procalcitonin, D-dimer

Automation and Analytical Techniques

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P-011

Abstract Reference : 65

Comparison Of Atellica UAS 800 Automated Urine Microscopy With Manual Microscopy And Iris IQ 200 Automated Urine Microscopy

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Purpose: Automated urinalysis can reduce the workload of conventional microscopic examination of urine sediment. The aim of this study is to compare the performance of Atellica UAS 800 (Siemens Healthcare Diagnostic. Inc.) automated urine sediment with microscopy manual method and iQ200 (Beckman Coulter Inc.) automated urine sediment. Our objective was to compare urine RBC, WBC and SEC (squamous epithelial cells).

Materials and methods: A total of 306 freshly collected urine specimens were compared for RBC, WBC and SEC by manual microscopy and automated analyzers which use different approaches to the digital microscopy, Atellica UAS 800 and iQ200.

Results: Comparison of Atellica UAS 800 with manual microscopy showed for RBC, WBC and SEC: Pearson's correlation coefficient r: 0.989 (P<0.0001); 0.987 (P<0.0001); 0.978 (P<0.0001), respectively. Passing-Bablok linear regression: $y=1.000x + 0.000$; $y=1.067x - 0.067$, $y=0.933x+0.000$, respectively. Bland-Altman analysis: bias: -0.1; -1.6, -0.5, respectively and limits of agreement: -4.1 to 3.9, -13.2 to 10.0; -4.8 to 3.7, respectively.

Comparison of Atellica UAS 800 with iQ200 showed for RBC, WBC and SEC: Pearson's correlation coefficient r: 0.974 (P<0.0001); 0.969 (P<0.0001); 0.942, respectively. Passing-Bablok linear regression: $y=0.929x - 0.750$; $y=1.000x - 0.750$; $y=1.000x+0.000$, respectively. Bland-Altman analysis: bias: 1.3; 0.6; -0.2, respectively and limits of agreement: -5.2 to 7.8; -13.0 to 14.1; -7.1 to 6.7, respectively.

Conclusions: A very good agreement was obtained between Atellica UAS 800 and other methods used. Urine analysis automation can reduce TAT, achieves a high degree of standardization and enables more careful treatment of the pathological samples.

Keywords : automated urine microscopy, urine sediment, manual microscopy, urinalysis

Automation and Analytical Techniques

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P-012

Abstract Reference : 81

Saliva Alpha-Amylase Study: New Kinetic Measurements Algorithm

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Whole saliva is a promising object for clinical laboratory diagnostics; however, there are still no standards for saliva testing.

Purpose: To optimize testing saliva for alpha-amylase and computing the initial velocity of amylase reaction.

Materials and methods: The study group comprised 20 healthy volunteers (10 men/10 women) aged 18 to 24 years. Whole saliva was collected using Salivette® saliva centrifuge tubes. Amylase reaction was studied using reagents from alpha-amylase SPINREACT kit (CNP3, kinetic, liquid) and a PerkinElmer Lambda 35 spectrometer. An original algorithm for estimating the initial amylase reaction velocity and the respective R scripts were developed.

Results: At difference from the standard protocol, the optical density of incubation medium was recorded every second. Quadratic approximation of the initial segment of kinetic curve and its differentiation made it possible to estimate the “initial single-point” value of the reaction velocity instead of an “average” over the first 3 minutes of reaction. The “initial single-point” value may exceed the “average” by one order of magnitude.

Conclusions: Our protocol makes it possible to extend the range of measured velocities of the enzyme reaction, to equalize the precision of testing samples featuring low and high enzyme activity, and to minimize assay time. This approach may be applicable to some other enzymes used in clinical and experimental medicine and biology.

Keywords : Saliva, alpha-amylase, reaction velocity, enzyme kinetics

Acknowledgments : *The study was carried out using the equipment of the “Observatory of Ecological Safety” resource center at the Research Park of St. Petersburg State University.*

Automation and Analytical Techniques

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P-014

Abstract Reference : *94*

Comparison of Erythrocyte Sedimentation Rate Measurement Reliability in Three Different Modes by Automated Autoanalyzer

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Introduction: Erythrocyte Sedimentation Rate (ESR) is a nonspecific sickness index, which is not diagnostic of any particular disease, but which when elevated may indicate the presence of inflammation, infection, rheumatologic disease, or neoplasm. ESR is among the most frequently studied tests in emergency laboratories¹. VISION automated ESR analyzer can run two different modes, cycle mode, and random mode. Cycle mode allows the user to place all samples at once and receive results for the whole batch after 20 minutes. The random mode allows the user to insert additional samples at any time, even when there are other tests running, results can be acquired after 20 minutes for each test. In random mode, the analyzer doesn't shake samples². In this study, it was aimed to investigate the difference between these modes during ESR measurement.

Method: ESR was performed in 3 different modes (cycle mode, random mode, and applied shaker before running random mode) on a randomly selected 101 patients' sample from the central laboratory. The statistical analysis was performed with IBM SPSS 20.0 Software. The normal distribution of the data for the parametric-nonparametric test selection was investigated by statistical evaluation. Wilcoxon signed rank test performed. The data were evaluated by the Bland-Altman method³ to compare 3 modes. The p-value of 0.05 (p<0.05) was considered significant in the analyze.

Results: The mean values of the three modes are 19.68 ± 14.90 mm/h (cycle mode), 17.48 ± 14.80 mm/h (random mode) and 18.80 ± 14.53 mm/h (applied shaker before running random mode) respectively. We found the statistical differences between two modes which are random mode and applied shaker before running random mode (p=0.016). And we found the statistical differences between two modes which are cycle mode and random mode (p=0.000). We didn't find the statistical differences between two modes which are cycle mode and applied shaker before running random mode (p=0.124). While Wilcoxon paired test showed statistical differences in the analyzes performed in different modes in the same patients, the analysis of the different modes with Bland Altman was similar within the %95 confidence interval.

Conclusion: According to our findings, ESR values which obtained from random mode within % 95 confidence interval are reliable for fast and accurate clinical assessment especially essential for the emergency department.

Keywords : ESR, VISION Autoanalyzer, Bland Altman

Automation and Analytical Techniques

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P-015

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A Simple Comparison Of Two Automated Urine Analyzers

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Aim: Automated urine analyzers are important components of the clinical laboratories. Urinalysis is mostly performed to diagnose urinary tract infections by measuring various parameters in urine. On the other hand, urinalysis has an important role on diagnosis of hepatic, metabolic, hemolytic and renal diseases. In this study, we aimed to compare analytical measurement results of two automated urinalysis systems; Sysmex UC-3500/UF-5000 and Dirui FUS-200/H-800.

Materials and Methods: A total of 43 urine samples were tested on both analyzers on the same day and within 1 hour for each sample, the results were compared in SPSS v.20 using Wilcoxon signed rank test and Spearman's correlation test. Due to the lack of enough pathological sample number, only following parameters were evaluated: white blood cell (WBC), red blood cell (RBC), epithelial cell (EC), pH and specific gravity (SG).

Results: According to the Wilcoxon signed rank test, SG results were tended to rank higher in Dirui FUS-200/H-800 ($Z= 4.36$, $p<0.001$) whereas WBC results were tended to rank higher in Sysmex UC-3500/UF-5000 ($Z=3.40$, $p=0.001$). RBC, EC and pH parameters were not found statistically significant. Spearman's correlation test showed very strong correlation between the two analyzers in all of the compared parameters (WBC: $r=0.938$, $p<0.001$; RBC: $r=0.830$, $p<0.001$; EC: $r=0.911$; $p<0.001$; pH: $r=0.846$, $p<0.001$; SG: $r=0.818$, $p<0.001$).

Conclusion: Even though significant differences were found in WBC and SG, %67 of our samples ($n=29$) were containing less than 5 leucocytes/HPF and %81 of the samples had normal SG values (1005-1030, $n=35$). Considering this, we guess that these significant differences may not be important on clinical decision. Forward studies with enough number of pathological and non-pathological samples will help to clarify this uncertainty.

Keywords : urinalysis, device comparison

Automation and Analytical Techniques

Status : Accepted - Poster Presentation

P-016

Abstract Reference : 266

Serum Free Light Chains Assays: Comparison Of Freelite® and Sebia FLC® Methods

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Aim: Serum free light chain (SFLC) assay is used in diagnosis, prognosis and management of pathologies such as myeloma, AL amyloidosis or light chain disease. It is proposed as a diagnostic and monitoring criterion according to the International Myeloma Working Group (IMWG 2014) recommendations. Analytical pitfalls related to nephelometry and turbidimetry methods have been described: antigen excess, inter-batch variability, lack of linearity or light chain polymerisation. Tools for detecting excess antigens exist using atypical reaction kinetics detection and automatic dilutions but lead to an overcharge of

measurements. According to the manufacturer's specification, the higher measuring range of the Sebia FLC® ELISA assay avoids this problem. We wanted to compare immunoturbidimetry Freelite® (The Binding Site) assay on the SPAPLUS® analyser with the Sebia FLC® ELISA assay on the DAS AP22 Elite.

Materials and methods: We have collected 206 samples prospectively in the biochemistry department of Lille hospital. We selected patients with monoclonal gammopathy and healthy control patients. Samples are collected on 5 mL clotting activator tube after centrifugation at 3000 rpm for 10 min. A free light chain assay was performed with both methods. Within-run and between-run performances, contamination and interference study related to plasma indices were performed with Sebia FLC® Elisa assay. Moreover, 35 patients from our cohort were followed up prospectively with 5 to 12 samples, which allowed us to compare the variation of the Kappa / Lambda ratio for 12 months.

Results: Within-run and between-run performances are in agreement with standards of ELISA (CV : 8-13.5%). DAS PLC AP22Elite analyzer does not show any contamination between samples. Preliminary results did not reveal any interference with lipemia, haemolysis and icterus. Cohen Kappa index between the Sebia FLC® and Freelite® is 0.84 for Kappa/Lambda ratio, meaning a high degree of concordance. However, Bland-Altman studies shows that Sebia FLC® overestimates values of Kappa and Lambda compared to Freelite® in low values while underestimating them for one logarithm in high values. We hypothesized that Sebia FLC® is closer to monoclonal peak quantification determined with electrophoresis of serum proteins electrophoresis and is less disturbed by light chains polymerisation. Sebia FLC® assay needed significantly fewer dilutions than Freelite® for the Kappa and Lambda light chain assays in our cohort (p <0.001), but the higher assay time need to be taken into account in laboratory management.

Conclusion: Limits of nephelometry and turbidimetry assay lead to some analytical issues. Antigens excess result in additional dilutions and increase false negative results. Therefore in this context, Sebia FLC® assay appears to be an alternative in determination of free light chains. Additional tests will evaluate its performances in daily practice.

Keywords : Method comparison, Serum free light chains assays, ELISA, Turbidimetry, Myeloma

Cardiology

Status: Accepted - Poster Presentation

P-017

Abstract Reference : 33

The Interface Between Fatty Acid Composition Of Platelet Membrane And Platelet-Leukocyte Aggregates Formation In Healthy Men

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Purpose: vascular inflammation plays an essential role in advancing endothelial injury and atherogenesis. Platelets and platelet-leukocyte aggregates are known to contribute to this ongoing injury, leading to cardiovascular outcomes. Therefore, the aim of this study was to evaluate the interface between platelet membrane fatty acids composition and formation of platelet-leukocyte aggregates.

Materials and methods: fatty acid methyl esters of platelet membrane of 79 apparently healthy men (average age 40.2) without any acute clinical condition at the time of the study were identified by gas chromatography/mass spectrometry while platelet-leukocyte aggregates were analyzed by whole blood

flow cytometry. Individuals were divided into quartiles according to the percentage of platelet–leukocyte aggregates. The composition of platelet membrane fatty acids was compared to the percentage of platelet–leukocyte aggregates’ formation of apparently healthy individuals.

Results: the ratio of 18:3n3 (α -linolenic acid)/20:5n3 (eikosapentaenoic acid) comparing the lowest and the highest percentage of platelet-monocyte aggregates’ formation has increased (Med=2.21 *versus* Med=4.16, $p=0.093$, Mann-Whitney) as well as in platelet-neutrophil aggregates (Med=3.91 *versus* Med=5.10, $p=0.232$, Mann-Whitney).

Conclusions: the increased ratio of α -linolenic acid/eikosapentaenoic acid in platelet membrane of platelet–leukocyte aggregates was found, probably due to intensified synthesis of precursors of biological active eicosanoids.

Keywords : platelet membrane, fatty acids, platelet–leukocyte aggregates.

Cardiology

Status : Accepted - Poster Presentation

P-018

Abstract Reference : 43

Relationship Between Cognitive Functions And Homosistein And Vascular Risk Factors In Geriatric Depression

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Objective: The objective of this study was to examine the relationship between cognitive functions and homosistein and vascular risk factors in geriatric depression

Methods: Our study was carried out with 40 patients aged 60 and above (geriatric MDB), 40 patients (adult MDB) between the ages of 18-60 and 40 healthy controls aged 60 and above. Structured psychiatric interview (SCID-I), sociodemographic data form, Hamilton Depresyon Rating Scale (HAM-D), Hamilton Anxiety Rating Scale (HAM-A), Standardized Mini Mental Test (SMMT), and Montreal Cognitive Assessment Scale (MoCA) were applied to the participants. The evaluation of the general cardiovascular disease risk was calculated based on “A general cardiovascular disease risk profile for use in the first stage: Framingham heart study” (Framingham Risk Score-FRS). Homosistein, B12 vitamin and folate levels were examined.

Results: HAM-D and HAM-A scores in geriatric MDB and adult MDB groups are higher in comparison with the healthy control group and no difference was determined between these two MDB groups. SMMT and MoCA scores in the geriatric MDB group were determined to be lower in comparison with the adult MDB and healthy control group. Geriatric MDB group displayed a low performance especially in the orientation, visual/spatial executive functions, memory and language areas. No difference was determined between the groups with regard to homosistein, B12 vitamin and folate levels. FRS scores were higher in elderly patients and controls than in adult MDD group. No correlation was determined between the homosistein levels, cardiovascular risk factors and cognitive functions in the geriatric MDB group. No correlation was determined in the adult MDB group between the homosistein levels and cognitive functions. A negative correlation was determined between FRS and SMMT in the language area ($p=0.004$). In the healthy control group, a negative correlation was determined between homosistein levels and SMMT total ($p=0.002$), SMMT orientation ($p=0.047$), SMMT attention and calculation ($p=0.002$), SMMT recall ($p=0.015$) and MoCA abstract thinking ($p=0.002$) scores. A negative correlation was determined between FRS and SMMT total ($p=0.008$), SMMT language ($p=0.027$), MoCA language ($p=0.011$) scores.

Conclusion: Although cardiovascular risk scores were higher in elderly with and without depression than adults with depression, there was no difference in homocysteine levels between the groups in our study. Cognitive functions were significantly impaired in the presence of depression in the elderly, but the severity of this impairment was not correlated with homocysteine levels. Our results suggest that there is a relationship between cognitive functions, homocysteine levels and cardiovascular risk factors in the elderly without depression.

Keywords : geriatric depression, cognitive functions, homosistein, vascular factors

Cardiology

Status : Accepted - Poster Presentation

P-019

Abstract Reference : 52

Implementation Of 0-Hour/1-Hour Algorithm In The Diagnosis Of Acute Coronary Syndrome With High-Sensitivity Cardiac Troponin T

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Aim: Advances in the sensitivity and precision of cardiac troponin assays and release of new clinical decision algorithms have enabled physicians to diagnose or rule-out acute coronary syndrome (ACS) earlier after the initial patient presentation, usually in emergency department. We aimed to validate a novel 1-hour algorithm using high-sensitivity cardiac Troponin T (hs-cTnT) measurement for early rule-out and rule-in ACS that has been implemented in the 2015. Guidelines of European Society of Cardiology (ESC).

Materials and Methods: We enrolled all the patients with acute chest pain presenting to the emergency department of our hospital (456 in total) from January to March 2017. hs-cTnT had been determined by electrochemiluminescence method performed on cobas e411 (Roche Diagnostics). hs-cTnT was measured at presentation and after 1 or 3 hours and was validated against final diagnosis. hs-cTnT values to “rule-out” were below 5 ng/L at presentation or below 12 ng/L at presentation with Δ 1 hour below 3 ng/L. hs-cTnT below 5 ng/L at the presentation for rule-out was applicable for chest pain patients with onset longer than 3 hours. hs-cTnT values to “rule-in” were at least 52 ng/L at presentation or Δ 1 hour at least 5 ng/L. Remaining patients were classified to the “observational zone” and treated following alternative 0-hour/3-hour algorithm.

Results: 350 out of 456 patients were treated following 0-hour/1-hour protocol (76.8%) and out of them, 191 (54.5%) were classified as “rule-out” (123 (35.1%) with hs-cTnT below 5 ng/L, 68 (19.4%) with 0/1-hour algorithm), 66 (18.9%) were classified as “rule-in” and 93 (26.6%) were classified as “observational zone”. In total, 73.4% of patients have been rapidly triaged within 1 hour.

Conclusion: Implementation of 0-hour/1-hour algorithm using ST-elevation, presentation values and changes in hs-cTnT values in the first hour enables rapid triage within 1 hour accelerating the management of suspected ACS thereby maximizing potential for effective treatment.

Keywords : acute coronary syndrome, high-sensitivity cardiac Troponin T, 0-hour/1-hour algorithm

Cardiology

Status : Accepted - Poster Presentation

P-020

Abstract Reference : 109

Comparison Of Troponin I And Hs-Troponin I Levels In Serum And Plasma Examples

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Cardiovascular diseases are the number one cause of death (30 % of all global deaths).

The most common of these diseases is acute myocardial infarction (AMI) and is associated with high mortality and morbidity rates. Troponins (Tn) in AMI have very high sensitivity . Today, high sensitivity troponin (hs-Tn) kits with a 10 to 100-fold lower limit of detection (LOD) level are produced in addition to Tn kits . Hs-Tn allows earlier diagnosis of AMI compared to conventional Tn and recommended by clinical guidelines . Serum or plasma may be used to determine Tn levels. However, for the serum, at least 30 minutes wait before centrifugation is necessary, there is no waiting for the plasma and the turn around time is decreased. In our study, we aimed to compare the levels of Tn I and hs-Tn I (we will work new in our laboratory) in serum and plasma specimens.

In this study 2 blood samples (lithium heparin for plasma, no anticoagulant for serum) were collected from 136 patients who were requested from Gazi University Medical Faculty Hospital Emergency Service. Tn I (LOD: 10 ng / L) and hs-Tn I (LOD: 2,3 ng / L) levels were studied by chemiluminescent immunoassay method (Beckman Coulter, Access). Correlation and Passing and Bablok Regression analyzes were performed to compare Tn I and hs-Tn I levels. In addition, the % CV at the Upper Reference Limit (URL) level for hs-Tn I was calculated. Sensitivity and specificity were calculated for hs-Tn I kit. Significant and strong correlation between serum and plasma Tn I results of patients (r: 0,782, p <0,01); there was also a significant and strong correlation (r: 0.946, p <0.01) between serum and plasma hs-Tn I results. Significant but moderate correlation between plasma Tn I and plasma hs-Tn I results (r: 0.596 p: <0.01); there was also a significant but moderate correlation (r: 0.6337 p <0.01) between serum Tn I and serum hs-Tn I results. Tn and hs-Tn measurements were found to be significantly different between plasma ((slope:0,5076 (CI:0,3803-0,6090), intercept:0,4728 (CI:0,0263-0,9422)) and serum ((slope: 0,4350 (CI:0,3009-0,5144), intercept:0,0101 (CI:-0,4638-0,5541)) . In addition, the regression equation between serum and plasma hs-Tn I was $y = x$ and there was no significant difference between them. The % CV at the URL level was 4,6 for hs-Tn I. The sensitivity of hs-Tn I was calculated as % 85.7 and the specificity % 85.2. Significant difference between Tn I (used in our laboratory) and hs-Tn I results are that the analytical sensitivity of the kits are different. But the clinical sensibilities of both tests were similar. In addition, the bias between serum and plasma results for hs-Tn I was found to be acceptable.

As a result, we decided to study hs-Tn I (we will work new in our laboratory) in the plasma instead of serum. Thus, we preferred to use plasma that give results faster in early AMI.

Keywords: Acute myocardial infarction, Troponin, high sensitivity troponin, chemiluminescent immunoassay

Cardiology

Status : Accepted - Poster Presentation

P-021

Abstract Reference : 111

Relationship Between Platelet –Mean Platelet Volume And Lipid Risk Factors (Atherogenic Index) For Cardiovascular Disease

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Aim: Various algorithms for predicting coronary atherosclerosis have been established, most of which are based on large epidemiologic and cohort studies. We examined the relationship between biochemical markers which defined risk factors for coronary heart disease, in this study. Specifically, we assessed the value of the ratio of serum Triglyceride to HDL-cholesterol ratio atherogenic index (AI), a functional marker of HDL, TG and platelet(PLT) and mean platelet volume (MPV).

Materials and Methods: The lipid profile and hemogram results of 809 patients (40% man, 60% women) were compared to the Ankara University Medical Faculty laboratory information system. Correlation between TG, HDL, atherogenic index, Platelet and Mean platelet volume values were used as confirmation that our study hypothesis

Results: PLT and MPV did not correlate with individual CVD risk factors with TG, HDL and AI. Significant correlation between HDL (<35) and MPV ($r = -0,25$ $p = 0,048$ %95 CI -0,4821 to -0,0019)

TG>200 mg/dL correlations;

TG-PLT $r = 0,056$ $p = 0,48$ %95 CI -0,1029-0,2135

TG-MPV $r = 0,036$ $p = 0,65$ %95 CI -0,1227-0,1942

AI- PLT $r = -0,12$ $p = 0,13$ %95 CI -0,2744 to 0,0374

AI- MPV $r = 0,02$ $p = 0,78$ %95 CI -0,1365 to 0,1797

HDL<35 mg/dL correlations;

HDL -PLT $r = 0,16$ $p = 0,20$ %95 CI -0,0932 to 0,4096

HDL -MPV $r = -0,25$ $p = 0,048$ %95 CI -0,4821 to -0,0019

AI -PLT $r = -0,11$ $p = 0,39$ %95 CI -0,3619 to 0,1484

AI-MPV $r = -0,007$ $p = 0,9581$ %95 CI -0,2517 to 0,2649

TG>200 mg/dL and HDL <35 mg/dL; AI-PLT $r = -0,39$ $p = 0,09$ %95 CI -0,7191 to 0,0741

TG>200 mg/dL and HDL <35 mg/dL; AI-MPV $r = 0,17$ $p = 0,48$ %95 CI -0,3088 to 0,5789

Conclusion: Decreased activity of HDL- elevated levels of TG and abnormal PLT-MPV profile may prognosticate the progression of atherosclerosis. AI may be an important tool for analyzing the results of clinical trials. A more detailed study with patients with cardiovascular disease should be performed.

Keywords : Lipid risk factors, TG, HDL, Atherogenic index

Cardiology

Status : Accepted - Poster Presentation

P-022

Abstract Reference : 199

Heart Valve Disease: The Role Of Calcidiol Deficiency, Elevated Parathyroid Hormone Levels And Oxidative Stress In Mitral And Aortic Valve Insufficiency

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Endothelia, intima, and connective tissues comprise the heart valves, but the relationship between heart valve damage, the pathogenesis of valve degeneration, and vitamin D, oxidative stress remains unclear. Here, we assessed serum 25(OH) vitamin D (calcidiol), parathormone (PTH), and redox balance in patients with mitral valve regurgitation (MR) and aortic valve regurgitation (AR). This study includes 56 chronic heart valve disease (HVD) patients. Patients were diagnosed with MR or AR depending on the echocardiographic findings. Also, 40 sex-matched healthy control participants were enrolled for comparison. Serum calcidiol, PTH, total oxidative status (TOS), and total antioxidative capacity were measured, and the oxidative stress index (OSI) was calculated. Patients with HVD demonstrated significantly higher PTH, increased TOS and OSI, and a higher frequency of calcidiol deficiency than the control participants. Calcidiol and TOS were negatively correlated ($r = -0.29$; $P < 0.005$), as were calcidiol and OSI ($r = -0.413$; $P = 0.001$). PTH and OSI were positively correlated ($r = 0.22$; $P = 0.02$). We demonstrate that vitamin D deficiency and secondary increases in PTH are highly prevalent. Heart valve regurgitation (AR and MR) is correlated to oxidative stress and hypovitaminosis D.

Keywords : Heart valve disease, Oxidative stress, Parathormone, Vitamin D

Cardiology

Status : Accepted - Poster Presentation

P-023

Abstract Reference : 200

No Association Between Vitamin D Levels And Inflammation Markers In Patients With Acute Coronary Syndrome

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A modern concept regards acute coronary syndrome (ACS) as an auto-inflammatory disorder. The purpose of the present study is to assess the plasma levels of inflammation related to biomarkers and cytokines in ACS patients and to correlate the values with 25-hydroxy vitamin D3 (calcidiol). There are no previously published reports concerning serum concentrations of inflammatory markers in patients with hypovitaminosis D in ACS. Eighty-eight consecutive patients with ACS [n = 47 ST elevation myocardial infarction (STEMI), n = 41 unstable angina pectoris (USAP)] were enrolled within 12 h after symptoms. The blood samples were collected on admission in order to evaluate calcidiol, serum amyloid A (SAA), interleukin (IL)-6, interleukin (IL)-10, tumor necrosis factor-alpha (TNF α) and high sensitivity C-reactive protein (hsCRP). Calcidiol, TNF α and SAA levels were significantly lower ($p = 0.01$, $p < 0.01$ and $p < 0.01$ respectively), whereas hsCRP levels were significantly higher ($p < 0.01$) in STEMI group as compared to USAP group. In the STEMI group, there were negative correlations between SAA and hsCRP ($r = -0.347$; $p = 0.01$) and SAA and IL-6

($r = -0.356$; $p = 0.01$). There was a positive correlation between IL-6 and hsCRP ($r = 0.529$; $p < 0.01$). In the USAP group, it was found that there were a strong negative correlation between SAA and hsCRP ($r = -0.75$; $p < 0.01$) and a positive correlation between IL-6 and TNF- α ($r = 0.54$; $p < 0.01$). This study demonstrates that calcidiol levels are not associated with the inflammation markers in patients with acute phase ACS.

Keywords : heart diseases, inflammatory markers, acute coronary syndrome, Vitamin D

Cardiology

Status : Accepted - Poster Presentation

P-024

Abstract Reference : 214

The Relationship Between HDL-Associated PON1 Activity, Oxidative Stress And Brain Natriuretic Peptide In NYHA Functional Class II-IV Heart Failure Patients

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As the role of oxidative stress on human diseases, including the cardiovascular system disorders, has accentuated, the ultimate need of reliable markers of oxidative stress becomes more imperative. We aimed to measure: activities of HDL-associated antioxidant enzymes, paraoxonase (PON1) and arylesterase (ARE); total oxidative (TOS) and antioxidative status (TAS), in heart failure (HF) patients, and search for correlations of these markers. The study group consisted of 70 subjects with HF. The patients were classified in three groups according to the suggestions of New York Heart Association. Serum levels of PON1, ARE, TOS, TAS, brain natriuretic peptide (BNP), uric acid (UA), creatinine, and lipid parameters were determined. The oxidative status index (OSI) was calculated. Plasma PON1 activity was significantly decreased ($p=0.04$), while BNP and UA levels were significantly increased ($p<0.0001$, $p= 0.03$, respectively), with the severity of the disease. ARE, TAS, TOS, and OSI did not show any statistically significant difference. Statistical analysis showed negative correlation between PON1, ARE activities and BNP; positive correlation between disease duration, UA and BNP. Also, a positive correlation was determined between TAS and UA. We report for the first time a notable relationship between HDL-associated anti-oxidant PON-1 activity and New York Heart Association classification for HF. These prominent results provide further support for the role for oxidative processes in the disease progression of HF and for the anti-oxidant compensatory role of HDL. We believe in the potential of antioxidant medications in HF and promote proper oxidative stress markers in routine use in diagnosis and follow-up.

Keywords: heart failure, oxidant, antioxidant, paraoxonase, arylesterase, oxidative stress, brain natriuretic peptide

Cardiology

Status: Accepted - Poster Presentation

P-025

Abstract Reference : 222

Phenotype Distribution Of The Paraoxonase Gene In Patients With Cardiac Disease

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Paraoxonase (PON1) is an enigmatic enzyme with multiple enzymatic properties including arylesterase and lactonase activities besides its ability to hydrolyze the toxic metabolite of parathion, paraoxon. The aim of this study was to determine the phenotype distribution of PON1 in patients with cardiac disease who were classified in coronary artery bypass grafting (CABG), heart valve disease (HVD), heart failure (HF) and ST elevation myocardial infarction (STEMI) groups and healthy subjects as a control group. A total of 300 people (100 cardiac surgery (70 CABG and 30 HVD), 70 HF, 30 STEMI patients and 100 healthy controls) were admitted to this study. Individual variations in PON1 were determined using the dual substrate (paraoxon and phenylacetate) method. The following phenotype distributions were found in the cardiac disease and control groups: cardiac disease group (n = 200): 48.5% (QQ), 42.5% (QR), 9% (RR) and control group (n = 100): 58% (QQ), 39% (QR), 3% (RR). RR (high activity) phenotypic distribution was more common in the cardiac disease group than in controls (p = 0.04). In particular, the frequency of the RR phenotype was two- to three-fold higher in the STEMI and HF patients compared to the controls as well as CABG and HVD groups. We found a higher percentage of RR phenotype in STEMI and HF patients compared to a large control group as well as compared to two other groups of cardiac disease patients.

Keywords : arylesterase, heart diseases, lipids, high-density lipoprotein, oxidative stress

Cardiology

Status : Accepted - Poster Presentation

P-026

Abstract Reference : 276

Predictive Value Of High Sensitivity Cardiac Troponin T Test In Patients Who Admitted To Emergency Department: Retrospective Cohort Study

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Background: Patients attending the emergency department often have simultaneous testing for both cardiac and non-cardiac conditions, to facilitate early diagnosis or discharge. High sensitive cardiac troponin T (hs-TnT) found its way into everyday clinical routine to diagnose acute myocardial infarction (AMI), but troponin concentrations are often elevated in patients who do not have AMI. Since its levels vary considerably based on the underlying pathophysiology of the patients, a non-selective approach to high sensitivity cardiac troponin testing may contribute to diagnostic uncertainty. The aim of this study was to evaluate the hsTnT test results with the clinical outcome by using different threshold values according to age and sex, and eventually to obtain a cost effective algorithm for the assessment of patients in the our hospital. Clinical records of the patients were followed up for the following year and the initial results obtained were shared with this abstract. Methods:Retrospectively, we analyzed the hs-TnT results of 11.878 patients admitted to adult emergency department (ED) of a tertiary referral hospital. We

obtained baseline clinical characteristics and investigations from a standardised electronic patient record. Patients were divided into two groups: first group; patients with suspected cardiac chest pain (n=2189), and second group; patients without chest pain (n=9056) Second group patients at low risk for adverse outcomes, consisting of patients with other non-cardiac morbidity. Patients in the first group had to have a baseline cardiac troponin measurement at presentation and at least one additional measurement within 24 hours of presentation, before discharge. Overall 114 patients had an acute cardiac event defined as Non-ST Elevated Myocardial Infarction (NSTEMI) and 83 patients had a ST-Elevated Myocardial Infarction (STEMI). Results: In first group patients attending the emergency department, 43.9% (963/2189) had high hs-TnT levels above the 99th percentile upper reference limit (0.014 mg/L). The prevalence of MI was 8.9% (197/2189) and the positive predictive value was 20.4%. The positive predictive value was highest in patients with chest pain (69.2%), evidence of myocardial ischaemia on electrocardiography (70.9%) or known ischaemic heart disease (68.1%) compared with those without. The positive predictive value was 83.2% (76.8% to 88.5%) in patients with all three of these clinical features. In the second group, 9.5% (867/9056) had high hs-TnT levels above the 99th centile. The prevalence of MI was 0.12% (11/9056), with a positive predictive value for MI of 1.2%. Conclusions: Determination of the implementation could improve the referral accuracy. It would decrease costs and provide significant hospital benefits.

Keywords : High sensitive cardiac troponin T, acute myocardial infarction, positive predictive value

Cardiology

Status : Accepted - Poster Presentation

P-027

Abstract Reference : 336

High-Sensitive Troponin And Galectin Levels After Marathon And Ultramarathon

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Background and aim: Physical activity definitively belongs to healthy lifestyle. There is a long-lasting debate whether running distances equal of longer to marathon distance holds some acute and long-term health risks. We aimed to measure high-sensitive troponin I (hsTnI) and galectin-3 as cardiac markers and cystatin C as kidney marker to evaluate possible organ damage in long-distance runners.

Patients and methods: We enrolled 29 long-distance runners (3 women) who provided venous blood samples before and after a competition run (various distances: 7 marathon, 18 ultramarathon 100 km and 4 between 45 and 91 km). HsTnI was measured by a chemiluminescence assay (Abbott), galectin-3 was determined by ELISA (MyBioSource) and cystatin C by immunoturbidimetric assay (Beckman-Coulter).

Results: We found a highly significant increase of hsTnI, galectin-3 and cystatin C after the run (p and 95% confidence interval of difference: <0.0001, 35.5 to 67.5 ng/L;<0.0001, 11.4 to 17.6 µg/L; 0.004, 0.057 to 0.24 mg/L resp.). More than 75 % of values after the run were higher than 26.6 ng/L (the combined 99th percentile). Interestingly, there was a significant positive correlation of changes in hsTnI and galectin-3 (r = 0.39, p = 0.04) and a negative correlation of hsTnI changes with cystatin C changes (r = -0.38, p = 0.048).

Conclusion: Majority of runners after the long-distance runs has increased levels of cardiac troponin I. Ev. prognostic significance of this finding together with the increase of galectin-3 and cystatin C needs to be determined prospectively.

This study was supported by the grant of Ministry of Health of the Czech Republic - Conceptual Development of Research Organization (Faculty Hospital in Pilsen - FNPI, 00669806).

Keywords : high-sensitive troponin I, galectin-3, cystatin C, marathon, ultramarathon

Cardiology

Status : Accepted - Poster Presentation

P-028

Abstract Reference : 133

Implementation And Verification Of Beckman Coulter High Sensitive Troponin I Immunoassay

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Aim: We've used the new high sensitive troponin I (hsTnI) in our laboratory for 6 months. We wanted to share our experience of replacing the cardiac biomarker troponin I by hsTnI and confirming some performance parameters in our laboratory (Access 2, Beckman Coulter Inc.).

Materials and Methods: We estimated analytical performance for limit of blank (LoB) using zero calibrator (N=10); limit of quantitation (LoQ) with $\leq 10\%$ coefficient of variation (CV) using 5 fresh plasma samples (N=10); imprecision of Sero Immunoassays Controls (Sero, Ballina, Norway: between days, assayed in 2 runs per day, over 31 days); bias through External Quality Assessment samples (cycle 10: samples 2, 3, 4, 5, 6). We also examined the upper reference limit (URL) through accumulated data including individuals (<50 years) having serum creatinine, CK-MB (mass), hsTnI results with exclusion of some diseases (epicrisis reports).

Results: Estimations were as follows; LoB: 0.14 pg/mL; LoQ ($\leq 10\%$ CV): 2.4 pg/mL; imprecision: 7.8% at a level of 37.99 pg/mL (N=62) and 8.11% at 310.32 pg/mL (N=64); bias: 8.77% (through 5 samples). There was a correlation between hsTnI and CK-MB (Spearman's $\rho=0.267$; $p < 0.0001$). The median (interquartile range) values of hsTnI for each gender were found 1.57 pg/mL (1.16 -2.25) for women and 2.28 pg/mL (1.75-2.98) for men; 99.09% of women (N=218/220) and 98.13% of men (N=210/214) were under the URL established in the kit insert (11.6 pg/mL for women and 19.8 pg/mL for men).

Conclusion: The new product was confirmed to be reliable and our findings were consistent with the insert data. We announced clinicians (departments of Emergency, Cardiology) about the changes in methods (hsTnI) and unit (pg/mL). In general, there's the lack of consensus on the most appropriate cut-off (URL) and interpretation for hsTnI concentrations, and published data on the key elements required for verification and implementation of hsTnI assays. Implementation of hsTnI testing requires collaboration between laboratories and clinical staff to cope with work overload in big hospitals.

Keywords : troponins; analytical performance; verification; cardiac biomarker; acute coronary syndrome

Cardiology

Status : Accepted - Poster Presentation

P-029

Abstract Reference : 138

Determinants Of Incident Chronic Kidney Disease And Renal Hyperfiltration In A Longitudinal Population-Based Study

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Chronic kidney disease (CKD) is one of three major chronic diseases leading to death. The total number of deaths caused by CKD nearly doubled the in the last two decades and the steep rise attributed mainly to the rising trend of BMI and hyperglycemia. Meta-analysis of longitudinal studies demonstrated that all-cause mortality risk was increased at lower estimated glomerular filtration rate (eGFR) and, adjusted hazard ratios for this risk at eGFR 60 and 45 mL/min/1.73 m² versus 95 mL/min/1.73 m² were 1.18 and 1.57, respectively. Although diabetes and high blood pressure mainly considered the most common causes of CKD, recent studies suggest female gender, age, elevated serum uric acid level and, body fat mass as independent factors. On the other hand, while the predictive effect of reduced eGFR was studied intensively, prospective evaluations of renal hyperfiltration (Hfil) are limited.

The aim of the present study is to identify the predictors of eGFR-based incident CKD and Hfil using multiple related risk factors in middle-aged Turkish adults.

1964 participants of the Turkish Adult Risk Factor Study who have at least two creatinine measurements in a mean 7.48 years' follow-up were constituted the study group. Serum concentrations of fasting glucose, total cholesterol, triglyceride, LDL-C, HDL-C and, creatinine were determined using Cobas c501 analyzer and, HbA_{1c}% was measured by D-10 HPLC. Participants were grouped with regard to eGFR as normal renal function, CKD and Hfil and analyzed using sex stratification. Two-sided t-tests and Pearson's chi-square tests were used to analyze the differences between means and proportions of groups. Risk estimates were obtained by Cox regression models that adjusted for sex, age, CKD, Hfil and relevant confounders expressed in terms of 1-SD increment.

Incident CKD was recorded in 110 and Hfil in 115 participants. Female gender, age, serum uric acid and high systolic blood pressure significantly and positively predicted incident CKD. Incident Hfil was predicted by younger age in men and by reduced serum uric acid in both sexes. Furthermore, wide waist circumference was additional determinant of Hfil in women. At 7.48 years' follow-up baseline Hfil independently predicted MetS in men and coronary heart disease in women.

In conclusion results of this longitudinal population-based study demonstrate that while older age, higher serum uric acid and systolic BP are independent predictors of incident CKD younger age and reduced serum uric acid are independent predictors incident Hfil. Both glomerular function and cardiometabolic risk need to be monitored in individuals who have risk factors for CKD and Hfil, including abdominal obesity, prediabetes, prehypertension, elevated/reduced uric acid levels.

Keywords : Estimated glomerular filtration rate, renal hyperfiltration, chronic kidney disease, cardiometabolic risk

Acknowledgments : This study is part of Turkish Adults Risk Factor (TARF) Study.

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-030

Abstract Reference : 246

Comparison of Troponin I and CKMB In Plasma And Serum Collected In New Blood Collection Tubes

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Aim: For a rapid turnaround time, plasma is the most preferred sample type for urgent tests. In this study, we compared serum with plasma using plain tubes and lithium heparin tubes with or without separator gel for cardiac Troponin I (cTnI) and CKMB quantification.

Materials and Methods: Patients from coronary care unit were included. Venous blood was collected from 48 patients. cTnI and CKMB were analyzed with immunometric method on Siemens Advia Centaur XP. The distributions were determined by one-sample Kolmogorov-Smirnov test, where the values were found as non-Gaussian hence median values were used. Sera obtained from plain tube was used as baseline. Statistical significance was evaluated with the nonparametric Wilcoxon signed rank test. The bias was calculated by the formula: $[(C_X - C_1)/C_1] \times 100\%$. C_1 : the median of the T_0 sample; C_X : the median of the experimented sample. Desirable bias was used for clinical value assessment.

Results: Statistically significant differences were found in both analytes with both plasma types compared with plain tubes ($p < 0.05$). Percentage change from baseline was clinically significant in heparin tubes without gel separator for cTnI assay (18.49%) according to desirable bias ($\pm 16.32\%$), whereas the bias was 7.96% in heparin with gel tube and clinically insignificant. CKMB biases were both lower than acceptable desirable biological variation in heparin tube (9.94%) and in heparin tube with gel (8.39%) compared with the desirable bias ($\pm 14.88\%$).

Conclusion: The new plasma tube of Vacusera (Disera Logistics Industry and Trade Inc., Izmir, Turkey) with heparin (without gel separator) was found as unsuitable for cTnI determination, but suitable for CKMB mass measurement. On the other hand, heparin tubes with separator gel were determined as suitable for both cTnI and CKMB mass analyses. As a result, Vacusera lithium heparin tubes with gel were found more suitable for both cTnI and CKMB mass analyses than lithium heparin tube without gel separator.

Keywords : gel-separator, plasma, serum, stat analysis

Cardiology

Status : Accepted - Poster Presentation

P-031

Abstract Reference : 271

The Distribution Of Obesity Problem In Patients Suffering From Cardiovascular Diseases.

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Aim: According to World Health Organization (WHO) in industrialized countries the cardiovascular (CVD) and cerebrovascular diseases are the third most common cause of death in the World. The main

risk factors are hypodynamia, obesity, smoking, alcoholism, stress, etc. Obesity plays a special role in the pathogenesis and progression of cardiovascular disease by promoting atherosclerotic plaque in vessels.

Material&Methods: The lipid profile tests were identified in 60 samples of patients over the 30 age. Test were performed by Cobas Roche in vitro diagnostic test system designed for quantitative determination of total cholesterol (TC), high-density lipoprotein cholesterol (HDL), low-density lipoprotein cholesterol (LDL), and triglycerides (TG) in human serum by photometric transmission measurement.

Results: The retrospective statistic research revealed normal test values in 40% of investigated people. However, 60% of patients had total cholesterol > 200, HDL <40, LDL > 130, triglyceride > 150 mg / dL with the prevalence of men, which constituted 67% of tested patients.

Conclusion: Since, obesity a chronic metabolic disorder associated with CVD and increased morbidity and mortality rates, the adults over the 20 age must be examined every five year to prevent formation of systemic hypertension, pulmonary hypertension (left ventricular failure, chronic hypoxia) and chronic heart diseases, which contributes to alterations in cardiac structure and function. The risk of sudden cardiac death is also increased in obesity.

Keywords : Obesity, cardiovascular disease, lipid profile.

Cardiology

Status : Accepted - Poster Presentation

P-032

Abstract Reference : 435

Association Of Osteoprotegerin With Hypertension

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Aim: Osteoprotegerin(OPG) is a member of the tumour necrosis factor receptor super-family and acts as an inhibitor of bone resorption. Nowadays, there is emerging evidence of the role of OPG in the pathogenesis of atherosclerosis, calcification and cardiovascular diseases. OPG levels have also been related to hypertension . It has been suggested that OPG participates in the pathogenesis of atherosclerosis and cardiovascular diseases by amplifying the adverse effects of inflammation and several traditional risk factors such as hyperlipidemia, diabetes mellitus, and hypertension. OPG levels were also found to be strongly associated with both systolic and diastolic blood pressure. Thus, serum OPG concentration might be a marker of hypertension. The aim of the present study is to investigate whether OPG levels are associated with the cardiovascular risk factors such as age, obesity, lipid levels in diabetic and nondiabetic hypertensive patients.

Materials and Methods: A total of 54 selected patients with hypertension were enrolled in the study (26 men and 28 women; mean age 56). The outpatients were included from Internal Medicine Department of Istanbul Medical Faculty. The control group were consisted of healthy volunteers without hypertension and the other cardiovascular risk factors (n=29). Cardiovascular risk factors determined in this study are defined as follows; obesity , hypertension, diabetes, dyslipidemia. The Statistical Software Package for Social Science (SPSS) for Windows, version 21.0 software program was used for all statistical analyses. P value < 0.05 was considered to be significant.

Results: OPG serum levels were significantly higher in patients with hypertension than those of the healthy subjects (p<0,001). OPG levels were also significantly higher in both diabetic(n=23) and nondiabetic hypertensive patients(n=31) than healthy subjects. On the other hand, OPG levels were significantly higher in diabetic hypertensive patients as compared with nondiabetic hypertensive

patients. We observed positive correlations between serum OPG levels, and body mass index (BMI), triglyceride levels in hypertensive patients. In contrary, there were no significant correlations between OPG and age, hs-CRP, total cholesterol, HDL and LDL cholesterol in hypertensive patients.

Conclusion: Clinical studies have shown that OPG levels were significantly elevated in hypertensive subjects compared to normotensives. Our results showed that OPG levels were significantly higher in both diabetic and nondiabetic hypertensive patients than healthy subjects. It has been also suggested that osteoprotegerin is associated with cardiovascular risk factors. We observed positive correlation between OPG levels and BMI in hypertensive patients. On the other hand, there was a conflicting association between OPG and lipid profile. Some authors indicated that there was no difference between OPG levels and subjects with dyslipidaemia and without dyslipidaemia. In our study, there were positive correlations between OPG and triglyceride levels, but we did not find any correlation between OPG and other lipid parameters. In conclusion, we suggest that OPG levels may be associated with cardiovascular risk factors in patients with hypertension. However, more detailed studies are required.

Keywords : Osteoprotegerin(OPG), hypertension, cardiovascular disease

Cardiology

Status : Accepted - Poster Presentation

P-033

Abstract Reference : 307

Fatty Acid Composition And Oxidative Stress In Acute Myocardial Infarction Patients With Normal And High Cholesterol Levels

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Introduction: High total cholesterol (TC) and low-density lipoprotein cholesterol levels are strong risk factors for myocardial infarction (MI). When blood cholesterol increases by 1%, the frequency of ischemic heart disease or coronary heart disease increases by 2% (1). However, although cholesterol is an important risk factor, cholesterol levels are normal in some acute MI-patients (2). In this study, we investigated Eicosapentaenoic Acid (EPA), monounsaturated (MUFA), polyunsaturated (PUFA) and saturated (SFA) fatty acid levels; desaturase indexes (D9D-18, D9D-16, D6D); and oxidant/antioxidant mechanisms in MI-patients with normal (<200 mg/dL) (MI-TC<200) and high (>200 mg/dL) (MI-TC>200) cholesterol levels and in healthy control subjects (CS) to determine whether these parameters differed between MI patients with high and normal cholesterol levels and CS.

Methods: 39 MI-TC<200; (7 female, 32 male), 42 MI-TC>200 (9 female, 33 male), and 21 CS (5 women, 16 men, 55.2±12.6 years) were included in the study. Mean age of MI patients was 60.2±12.6 years. Plasma fatty acids were measured by Gas chromatography–mass spectrometry; total cholesterol, total oxidative stress (TOS) and total antioxidant capacity (TAS) were measured spectrophotometrically. Indexes were calculated as follows: D9D-18 index: C18:1n9/C18:0, D9D-16 index: C16:1/C18:0, D6D index: C18:3n6/C18:2n6.

Findings: Arachidonic acid levels (%) were significantly higher in MI-TC>200 (2.27±2.54) compared to MI-TC<200 and CS groups (1.15±2.29 and 0.70±1.76, respectively). EPA levels (%) were significantly lower in MI-TC>200 (2.57±2.38) compared to MI-TC<200 and CS groups (4.28±2.86 and 4.22±2.23, respectively). SFA levels (%) were similar between the groups (37.09±2.42, 37.31±3.16 and 37.55±5.50 in MI-TC<200, MI-TC>200 and CS groups, respectively). PUFA levels (%) were 7.48±2.27, 6.93±1.52

and 6.85 ± 2.29 ; MUFA levels (%) were 24.97 ± 5.11 , 27.04 ± 4.01 and 22.13 ± 9.65 ; D9D-18 indexes were 2.78 ± 0.79 , 3.14 ± 0.54 and 2.69 ± 0.48 ; D9D-16 indexes were 0.002 ± 0.002 , 0.003 ± 0.002 and 0.004 ± 0.010 ; D6D indexes were 0.039 ± 0.027 , 0.046 ± 0.018 , and 0.038 ± 0.028 , TOS levels (umol/L) were 21.80 ± 7.47 , 26.60 ± 10.48 , and 13.89 ± 1.57 ; TAS levels (mmol/L) were 0.43 ± 0.09 , 0.33 ± 0.15 , and 0.49 ± 0.06 in MI-TC<200, MI-TC>200 and CS groups, respectively. MUFA levels, D9D-18 index and TOS levels were significantly higher whereas TAS levels were significantly lower in MI-TC>200 group as compared to other groups. TOS levels were significantly higher whereas TAS levels were significantly lower in MI-TC<200 compared to CS.

Conclusion: The degree of inflammatory response due to changes in the blood lipid and fatty acid balance establishes a basis for the formation of acute coronary syndrome by directing pathogenesis. Our findings indicate that there is more inflammation and oxidative stress in MI patients with high cholesterol levels compared to those with normal cholesterol levels.

Keywords : Myocardial Infarction, Cholesterol, Fatty Acids, Oxidative Stress

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-034

Abstract Reference : 12

Epidemiology Of Thyroid Disorders During Pregnancy.

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Aim: Pregnancy results in many physiological changes in the regulation of thyroid function. The management of thyroid diseases in pregnant women varies from non-pregnant women. The thyroid gland increases in size, and there are a lot of factors contributing to the occurrence of goiter during pregnancy. In the early stages of pregnancy, the increased level of hCG has stimulating effects on the TSH receptor and leads to a small decrease of TSH levels in serum. Other factors include an increased renal clearance of iodide, and increased supply of iodine to the fetus, which result in a lowered maternal iodide reserve. Also, the concentration of TBG increases due to the increased synthesis of TBG caused by raised estrogen levels. Thus the level of total T4 and T3 are elevated.

Materials & Methods: During a one year period in our hospital, 1539 pregnant women underwent comprehensive diagnostic tests and analysis for each trimester, including thyroid function tests with automated immunoassay (ECLIA) for the in vitro quantitative determination of thyrotropin, free triiodothyronine and thyroxine in serum.

Results: In 2017, 1539 pregnant women were observed, and 413 of them were found to have thyroid dysfunction in different trimesters, constituting 26.83%. Overt hypothyroidism was present in 8.5% of all pregnant women, but subclinical in 17.5%. Overt hyperthyroidism was present in less than 1% of pregnant women. Postpartum thyroiditis was observed to occur in 7.47% of all women after giving birth. The reference range of TSH for pregnant women in our clinic was <2.5 mIU/L for each trimester.

Conclusion: All forms of thyroid dysfunctions during pregnancy linked to the increased rate of miscarriage, preterm delivery, maternal congestive heart failure and mental problems. In Azerbaijan, due to living in iodine deficient areas, population hypothyroidism is widespread with a prevalence of autoimmune thyroiditis. Therefore, it is very important to treat pregnant patients from the early stages of pregnancy.

Keywords : Overt hyperthyroidism , overt hypothyroidism , subclinical hypothyroidism , postpartum thyroiditis.

The Evaluation Of Calcium Metabolism In Thyroid Patients.

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Aim: The regulation of bone turnover is influenced by genetic race, hormonal, mechanical and nutritional factors. The thyroid status is one of the significant factors influencing bone mass. The thyroid hormones via α and β thyroid hormone receptor (TR) maintain critically important functions in regulation of bone cell, such as proliferation and differentiation of chondrocytes, osteoblasts and osteoclasts. Thyrotoxicosis associated with acceleration of bone remodeling system and known as a risk factor for osteoporosis. In children, hyperthyroidism enhance mineralization and accelerates epiphyseal maturation, in adults it induces bone loss by activation of osteoclast activity. On the contrary, hypothyroidism leads to a low bone turnover, with a reduction of osteoclast bone resorption and of osteoclast formation. Calcium metabolism is frequently altered in thyroid dysfunctions. Our investigation has been undertaken to study the total serum calcium levels in patients with thyroid diseases.

Materials & Methods: 100 patients with thyroid dysfunction were divided into 4 groups each consisting of 25 cases: patients with overt hyperthyroidism (I group), subclinical hyperthyroidism (II group), overt hypothyroidism (III group) and subclinical hypothyroidism (IV group).

For quantitative determination of thyrotropin (TSH), free triiodothyronine (fT3) and thyroxine (fT4) an automated electrochemiluminescence immunoassay (ECLIA) was used. Biochemical markers of calcium metabolism were serum and urinary levels of calcium (COBAS INTEGRA systems), and ionized calcium level in a lithium heparin plasma (i-STAT System, Abbott).

Results: Patients with overt hyperthyroidism showed increase in ionized and total calcium levels with 8 and 4 percentages respectively. The urine calcium level was significantly high in 32% of patients with thyrotoxicosis. Patients with subclinical hyperthyroidism had normal calcium level in blood, however the calcium excretion was high in 20%. The total and urine calcium levels in patients with overt and subclinical hypothyroidism were normal, except the ionized calcium level of hypothyroid patients (decreased in 16% of cases).

Conclusion: The thyroid hormones play a key role for normal growth and development of skeleton. Therefore, for all patients with thyroid alterations must be recommended the observation of bone and calcium metabolism markers to prevent further complications and to the management of thyroid patients.

Keywords : Thyroid diseases, thyrotoxicosis, hypothyroidism, calcium metabolism.

Can Serum Adiponectin Levels Be Used In Monitoring Diabetic Retinopathy?

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Aim: Adiponectin (ADPN) has positive effects on the cardiovascular cells because of its antidiabetic, anti-inflammatory, regulator of endothelial functions, antioxidant, antiapoptotic, antiaterogenic, inhibitor of smooth muscle proliferation, vasodilator and antitrombotic properties. In this study, the relation between serum ADPN levels and diabetic retinopathy degree was investigated, using some indices of anthropometric measurements and inflammatory markers.

Materials and Methods: Patients at ophthalmology and diabetics clinics included our study. Demographic background, history of illnesses and drug/smoking consumption, anthropometric measurements and blood inflammatory markers of C-reactive protein (CRP) and fibrinogen levels were taken into consideration. Patients with thyroid dysfunction, urinary infection, inflammatory diseases, malignancy, estimated glomerular filtration rate below 30 mL/min or patients on therapy for nephropathy were all excluded this study. Subjects were divided into four different groups; group 1 (non-diabetic individuals, N=27), group 2 (diabetics without retinopathy, N=45), group 3 (mild to moderate diabetic retinopathy, N=26) and group 4 (severe non-proliferative or proliferative retinopathy, N=24). Retinopathy degrees were defined according to clinical examination and angiographic findings. Serum ADPN was measured using immunoturbidimetric method (Randox Laboratories Limited, UK).

Results: Group 1 had higher ADPN/CRP median values than group 2 and 3 ($p<0.0001$, $p=0.003$, respectively). In group 4 indices of ADPN/CRP could not differ from group 1. ADPN and indices of ADPN/waist circumference, ADPN/body mass index and ADPN/fibrinogen median values were found significantly higher in group 4, compared to group 2, ($p=0.005$, $p=0.008$, $p=0.008$ and $p=0.004$, respectively).

Conclusion: Severe inflammation in advanced diabetic retinopathy and the risk for diabetic vascular complications may be shown with alterations in ADPN and the indices of ADPN/waist circumference, ADPN/body mass index and ADPN/fibrinogen when the accurate cut-off values were determined for diabetics. Adipokines show alterations in inflammation, and great biological variations between subjects; this problem may be coped with using indices of ADPN with waist circumference, body mass index, fibrinogen) in diabetics.

Keywords : adipokines, adiponectin, diabetic retinopathy, inflammation, obesity

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-037

Abstract Reference : 23

Inherited Amino Acid Metabolism Disorders among Children with Mental Retardation

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Background: Surveys revealed that 6.6% of school-age children in Mongolia suffer from mental retardation. In order to assess the need for implementation of newborn screening for amino acid disturbances in Mongolia, this study evaluates the status of inherited disorders of amino acid metabolism among children with oligophrenia.

Methods: Screening tests were carried out in dried blood spots of 476 children diagnosed with oligophrenia. Amino acid levels in urine and blood samples of the children with positive screening findings were determined using the high-performance liquid chromatography system.

Results: The screening analysis detected elevated amino acids in twelve children. Due to refusal of caretakers of four out of these twelve positive children, the status of urinary and blood amino acids was evaluated in eight children. The assessment results indicated that the mental retardation in two children was not caused by errors of amino acid metabolism. In two of the remaining positive children elevated concentrations of glycine and threonine were found which lead to the diagnosis of pyridoxine-dependent epilepsy. The test results of other four children indicated hypertyrosinemia, hypervalinemia, hyperlysinemia and non-ketotic hyperglycinemia.

Conclusion: The survey findings show that one of the causes of oligophrenia in Mongolia are inherited errors of amino acid metabolism, and this fact urges the necessity of inclusion of amino acids into the newborn screening program.

Keywords : amino acids, metabolism, children, Mongolia, oligophrenia

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-038

Abstract Reference : 44

Reference Ranges For 25-hydroxyvitamin D Determined By Bhattacharya Method In Istanbul, Turkey

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Aim: Reference intervals/ranges are the most widely used decision-making tool in laboratory medicine and serve as the basis for many of the interpretations of test results. There is no agreement on the reference (“normal”) ranges for serum 25-hydroxyvitamin D (25(OH)D) between different societies' guidelines. Therefore, this study was performed to determine our population-based reference ranges of 25(OH)D which is the best indicator of vitamin D status.

Materials and Methods: Results of 8737 adults (1296 male and 7441 female) who were ≥ 18 years old were obtained retrospectively from the laboratory information system between the dates of May 2015 and May 2017. All 25(OH)D levels had been analyzed with LC-MS/MS. Logarithmic transformation was performed for Gaussian distribution. After the exclusion of extreme values, reference ranges were determined with Bhattacharya method. The need for partitioning reference ranges was considered based on Harris-Boyd model.

Results: After the exclusion of extreme values, remaining participants' (8709 adults) median 25(OH)D level was found as 15.6 ng/mL. The determined reference ranges for 25(OH)D for adults were 7.3 – 21.1 ng/mL. There was no need for partitioning reference ranges by age group (18-64 or ≥65 years old), gender or seasons.

Conclusion: Determination of the appropriate vitamin D reference intervals and deficiency level is so essential for clinical laboratories to avoid unnecessary testing and consequently unnecessary treatments which can lead to hypervitaminosis D.

Keywords : vitamin D, 25-hydroxyvitamin D, reference range, Bhattacharya method

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-039

Abstract Reference : 53

High Prevalence Of Exocrine Pancreatic Insufficiency In Type 1 Insulin Dependent Diabetes Mellitus.

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Aim: There have been many studies that have reported evidence of exocrine pancreas dysfunction in diabetes mellitus using faecal elastase assays. However, there are no formal guidelines which recommend screening for exocrine pancreatic insufficiency in diabetic patients and some NHS trusts fail to do so, despite gastrointestinal discomfort being reported as a common occurrence for this patient group. This study assessed if there is an increased prevalence of exocrine pancreatic insufficiency within a selected population of type 1 insulin dependent diabetes mellitus (IDDM) patients at (University Hospital Coventry and Warwickshire) UHCW NHS Trust. The study aimed to identify any observations that could be used to ascertain those most at risk of developing exocrine pancreatic insufficiency.

Materials and Methods: Faecal elastase was measured using the ScheBo Pancreatic Elastase 1 ELISA in 20 type 1 IDDM patients and in 20 non-diabetic control patients. Data was collected on insulin use, body mass index, age at diabetes onset, duration of diabetic disease, haemoglobin A1c level and the presence of microvascular or ocular complications. History of gastrointestinal discomfort and dietary habits were obtained using a patient questionnaire. The Wilcoxon matched pairs test was used to compare the faecal elastase concentrations measured in type 1 IDDM and in non-diabetic individuals. To assess correlation between the faecal elastase level and observations, Pearson correlation was used.

Results: 20 type 1 IDDM patients (10 male, 10 female, 10 paediatric - mean age 9, 10 adult - mean age 44) were studied alongside 20 age and sex matched non-diabetic control subjects. Faecal elastase was normal (>200 ug/g) in 100% of the control group. In the type 1 IDDM patients, faecal elastase was normal in 16/20 (80%), mild insufficiency (100-200 ug/g) was observed in 1/20 (5%) and severe insufficiency (<100 ug/g) in 3/20 (15%). All patients with any exocrine pancreatic insufficiency were adult patients, all of the paediatric patients had a normal faecal elastase of >200 ug/g. Compared with the control group patients with diabetes had significantly lower faecal elastase values with statistical significance, $p = <0.0005$. A number of associations of moderate strength were identified between the observations made and the faecal elastase results of the diabetic group. These included age of the patient ($r = -0.446$, $p = 0.02$), age at diabetes onset ($r = -0.419$, $p = 0.03$), loss of appetite ($r = -0.496$, $p = 0.01$) and microvascular complication ($r = -0.470$, $p = 0.02$).

Conclusion: This study confirms that type 1 IDDM patients at UHCW NHS Trust show pathological exocrine function at a higher prevalence than non-diabetic patients, in accordance with rates reported in the literature. In conclusion, this study supports the screening of adult type 1 IDDM patients at UHCW NHS Trust for exocrine pancreatic insufficiency, but particularly those adults who were diagnosed at a

young age, who are suffering from microvascular complications or any gastrointestinal discomfort that affects their appetite.

Keywords : Faecal elastase, exocrine pancreatic insufficiency, type 1 insulin dependent diabetes mellitus.

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-040

Abstract Reference : 87

The Validity of Serum Osmolality Determinations: Comparison of Measured and Calculated Osmolality Levels

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Aim: Osmolality is the molar amount of the substance dissolved in 1 kg of solvent. Serum osmolality can be described as the amount of dissolved minerals in the blood. In particular, serum osmolality levels are measured to determine acid-base and electrolyte imbalance in serum. Osmometers are using for measuring osmolality of biological materials. In cases where measurement is not possible, the serum osmolality value can be calculated by various calculation methods. In this study, we compared the osmolality calculation method which is used most frequently mentioned in literature and the measurements made with osmometer used in our laboratory. We also compared whether both measurement and calculation methods gave the same values between age groups

Material and Methods: 221 patients who were admitted to the Eskişehir Osmangazi University Hospital Biochemistry Laboratory between December 2016 and May 2018 were included in this study. The calculation method we used in our study is 'Osm = 2*Na + BUN/2.8 + glucose/18'. Glucose, blood urea nitrogen (BUN) and sodium (Na) values were recorded to determine the calculated osmolality values of the patients.

Results: There was a statistically significant difference between the measured osmolality values and the calculated osmolality values of the patients (284.00(277.00-293.00) and 288.79(283.09-295.86), p<0.001). When comparing according to age groups, there was a significant difference between calculated osmolality values (p=0.006) but there was no difference in measured osmolality values (p=0,787) in different age groups. It has been observed that this difference in the calculated osmolality values is derived from only the adult age group (18-65, p<0.001). Besides, the calculated osmolality values in the adult group showed a statistically significant difference compared to the measured osmolality values when the patient results in normal osmolality range (p<0.001).

Conclusion: According to our results, it is not reliable to calculate serum osmolality values, especially in the adult age group. Our results showed that the calculated osmolality values are higher than the measured osmolality values. However, in pediatric and geriatric patients, there was no significant difference in the calculated and measured osmolality results.

Keywords : Osmolality, Age Groups, Laboratory Tests, Electrolytes

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-041

Abstract Reference : 99

New Generation Assays For Measuring Thyroid Stimulating Antibodies In Graves' Disease

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Graves' disease is the most common cause of hyperthyroidism (1). Graves' disease (GD) is an autoimmune disease caused by autoantibodies, which bind to the thyrotropin (TSH) receptor (TSHR) on the surface of thyrocytes, stimulating and resulting in uncontrolled overproduction of thyroid hormones (2). TSHR antibodies are important in the diagnosis of Graves' disease. The measurement of these antibodies used in the diagnosis of Graves' disease is made in 2 forms. The first test, called thyrotropin receptor antibody (TRAb), measures inhibitor antibodies as well as stimulating TSHR antibody. However, the second test, termed thyroid stimulating immunoglobulin (TSI), measures only stimulating antibodies(3). In this study, we aimed to compare TRAb (by RIA method) and TSI levels (by chemiluminescent method) in patients with Graves' disease.

Eighty patients with Graves' disease who attended to the department of Endocrinology and Metabolism of Gazi University Faculty of Medicine were included in the study. The diagnosis of Graves' disease was made by thyroid function tests (TSH, free T3, free T4), TRAb, thyroid ultrasonography and uptake examinations. Patient samples were studied by RIA (TRAb) and chemiluminescence immunoassay (TSI) method (Immulite 2000) at Gazi University Medical Faculty Hospital Biochemistry Laboratory. The data were analyzed using the SPSS program by Chi-Square analysis.

The cut-off values of RIA and chemiluminescence immunoassay methods were 14.0 U/L and 0.1 IU/L respectively. When the results were examined, in RIA method 28 patients were negative and 52 patients were positive, but in chemiluminescence method 3 were negative and 77 were positive in 80 patients ($p = 0.04$). Sensitivities of methods for RIA and chemiluminescence were 65% and 96%, respectively ($r=0.535$, $p<0.001$).

In conclusion, we found that TSI reagents had higher sensitivity than TRAb.

Keywords : Graves' disease, TRAb, TSI, RIA, chemiluminescence immunoassay

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-042

Abstract Reference : 102

A FT3 Interference Detected By Means Of Active Laboratory-Physician Communication

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A large number of tests in clinical laboratories are being studied via immunoassays. In immunoassays, some interferences can be seen due to problems arising from antigen-antibody binding principle. Detection of interferences is of great value because it can prevent unnecessary further tests, invasive procedures and improper treatments.

A 32-year-old female patient who admitted to the Department of Endocrinology and Metabolism was consulted to our laboratory for a suspected interference due to clinically discordant fT3 levels. When the patient's history was examined, we learned that the patient had been treated with methimazole for 5 months because of thyrotoxicosis, and the drug treatment was discontinued for the last 2 weeks for the suspicion of the prior discordant thyroid hormone levels. The patient had elevated fT3 levels for 10 months, while fT4 and TSH levels were normal. The patient had multiple nodules in the thyroid; there was no other drug or monoclonal antibody use. When asked, there was no animal exposure and there were no additional illnesses including autoimmune diseases.

The results of the patient were fT3=10,7 pmol/L (3,99-6,71), fT4=12,6 pmol/L (7,9-14,4), TSH=1,581 mIU/L (0,38-5,33) (Beckman Coulter, DxI 800), the results didn't change when the analysis was repeated. Then the patient's sera were aliquoted and the tests were run in 2 different systems (Abbott and Roche) in different laboratories. One of the samples of the patient was sent to the Beckman Coulter Immunodiagnostic Development Center in France for interference testing since the results of thyroid function tests performed in these laboratories were within the reference ranges. The interference investigation was performed after the result of the fT3 measurement was found to be 9,22 pmol/L (3,84-5,99) at this center. In the interference testing, a pool of HBR-1 and PolyMak-33 as blocking agents, and in addition to this, goat IgG was also used. In addition, Scavenger ALP was used to detect ALP interference. After treatment of the sample with the indicated antibody pool and with goat IgG, the fT3 levels were measured as 6,25 pmol/L and 6,42 pmol/L, respectively (The change in fT3 result were calculated -32.2% and -30.3%, respectively). When evaluating the results, it was accepted that there is no interference if the percentage change between the two results is less than 25%. Since there was a change of more than 25% between the first measurement and the measurement made after the use of blocking agents, it was determined that the cause of the fT3 elevation in this patient was a false elevation due to an interference caused by heterophile antibodies.

The frequency of interference in immunoassays is low, but it is predicted that the frequency of interference will increase steadily due to the increase in the use of monoclonal antibodies. In case of clinically discordant results, interference should be suspected. It is important to know that test results that are erroneously given due to interference can cause false diagnosis and treatment and threaten patient safety. The communication between the laboratory-clinician and the laboratory-manufacturer must be at a good level in the management of the interferences, and each laboratory should develop procedures for the management of these cases.

Keywords : Interference, immunoassay, thyroid function tests, free T3, heterophile antibodies, patient safety

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-043

Abstract Reference : 395

Performance Of Glycated Albumin For Type 2 Diabetes And Prediabetes Diagnosis In A South African Population

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Aim: To assess the utility of glycated albumin (GA%) as a diagnostic marker of type 2 diabetes and prediabetes in an African population.

Materials and Methods: GA% levels were determined in a sample of 1294 mixed ancestry adults residing in Cape Town using an enzymatic method. The participants' glucose tolerance status was based on oral glucose tolerance test (OGTT).

Results: The optimal thresholds of GA% to diagnose screen-detected diabetes and prediabetes, were 14.90% and 12.75% respectively. For screen-detected diabetes, the C-statistic was higher for glycated hemoglobin (HbA1c) than GA% ($p=0.034$) with values of 0.899 (95% CI 0.855-0.943) and 0.873 (0.782-0.892) respectively. The agreement between GA% and HbA1c at their optimal thresholds for diagnosing screen-detected diabetes, was $kappa=0.33$ (95%CI 0.26-0.40) and was higher than the agreement for prediabetes, $kappa=0.16$ (0.11-0.21). The performance of GA% to identify screen-detected diabetes at the optimal threshold of 14.90%, was 64.8% (95% CI 54.1%-74.6%) for sensitivity and 93.5% (92.0%-94.9%) for specificity. GA% was significantly less sensitive, but more specific than HbA1c (at the optimal threshold of 6.15%) for screen-detected diabetes diagnosis (both $p\leq 0.002$ from McNemar tests for sensitivity and specificity comparisons).

Conclusions: GA% performed less well than HbA1c (at a cut off of 6.15%) to identify participants with OGTT-diagnosed type 2 diabetes or prediabetes in this population.

Keywords : Africa, Glycated albumin, diabetes, prediabetes

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-044

Abstract Reference : 396

Reference Interval Determination For Glycated Albumin In A South African Population

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Aim: Glycated proteins, such as glycated haemoglobin (HbA1c) and glycated albumin (GA%), are increasingly being used for the assessment of glycaemic control and the diagnosis of diabetes mellitus. GA% is an intermediate marker of glycaemic control that is not influenced by factors that affect HbA1c levels and may be a better marker in these situations. The aim was to determine reference intervals for GA% in a South African population.

Materials and Methods: We measured GA% using an enzymatic method on stored serum samples of healthy individuals who were recruited in Cape Town, South Africa using IFCC (International Federation of Clinical Chemistry and Laboratory Medicine) recommendations. The overall reference interval for GA% was determined using non-parametric methods and specific reference intervals were determined for age, sex, ethnicity and body mass index (BMI).

Results: The reference interval (2.5th to 97.5th percentile) for GA% of 663 healthy individuals (mean age, 34 years, 38.6% males) ranged from 10.7% to 15.2%. The median GA% in females was higher than in males ($p<0.0001$). Females had a reference interval of 11.0% to 15.5%, whereas it was 10.6% to 14.4% in males. The median GA% for Caucasians and mixed ancestry subjects were both 12.9%, whereas Black subjects had a higher median GA% of 13.3% ($p=0.0025$). As an inverse relationship was observed between body mass index (BMI) and GA%, we determined reference intervals in obese, overweight and normal weight subjects. The GA% reference intervals for subjects with BMI $<25\text{kg/m}^2$ was 11.2% to 15.3%, for BMI $25\text{-}30\text{kg/m}^2$ it was 10.5% to 14.9% and 10.0% to 14.6% for BMI $>30\text{kg/m}^2$ ($p=0.0001$).

Conclusions: The overall reference interval showed good correlation with reference intervals determined in other studies and we have for the first time determined these values in obese and non-obese healthy individuals. The differences observed in the reference intervals based on age, sex and BMI, were also in accordance with previous studies.

Keywords : glycated albumin, glycated proteins, reference interval, diabetes mellitus, prediabetes

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-045

Abstract Reference : 136

Thyroid Stimulating Immunoglobulins in Graves' disease diagnosis

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Background-Aim: Graves' disease is the most common cause of hyperthyroidism. It is autoimmune disorder caused by the presence of thyroid stimulating immunoglobulins (TSI) that bind to the TSH receptor (TSHR) and mimic Thyroid Stimulating Hormone (TSH) stimulation of the thyroid cells resulting in uncontrolled production of thyroid hormones that leads to hyperthyroidism. TSIs can bind to tissues in the eyeballs and beneath the skin and contribute to the development of Graves' disease-specific extra thyroidal manifestations of the bulging eyes and pretibial myxedema. In contrast, Thyroid Blocking Immunoglobulins (TBI) binds to the TSHR and inhibits TSH stimulation of thyroid cells, leading to hypothyroidism. Currently, the laboratory diagnosis of Graves' disease is based on thyroid hormones and TSHR autoantibody (TRAb) measurement. However, TRAb antibodies do not distinguish TSI from TBI, resulting in a certain percentage of poorly diagnosed patients. The aim of the study was to compare the utility of TSI and TRAb tests in the diagnosis of Graves' disease.

Materials and Methods: Our study included 65 female patients with a median age of 50 years (range 20-79), received at the Clinical Institute of Nuclear Medicine and Radiation Protection, University Hospital Centre Osijek, Osijek, Croatia with a clinical manifestation of Graves' disease. Venous blood for TSH, free thyroxine (fT4), free triiodothyronine (fT3), TRAb and TSI measurement was collected in serum vacutainer tubes and centrifuged at 3500 rpm for 10 min. Serum aliquots were stored at -20°C until analysis. Levels of TSH, fT4 and fT3 in serum samples were determined retrospectively on the fully automated chemiluminescence immunoassay platform Architect i1000SR (Abbott Laboratories, Lake Forest, USA), TRAb on an electrochemiluminescence immunoassay platform Cobas e601 (Roche Diagnostics Ltd. Mannheim, Germany) and TSI on chemiluminescence immunoassay platform Immulite 2000 XPi (Siemens Healthcare Diagnostics Inc., Flanders, USA). Statistical analysis was performed with the MedCalc, Version 12.4.0.0. (Medcalc Software, Mariakerke, Belgium).

Results: Based on TSI concentrations, the patients were divided into two groups: 47 with Grave' disease and 14 with hyperthyreosis of another cause. For TRAb, sensitivity of 87.8% and specificity of 93.7% were calculated by the receiver operating characteristic (ROC) analysis at the limit value of 1.9 U/L and the associated area under the curve (AUC) value of 0.915 (95% CI 0.818-0.969). At the threshold value defined by the TRAb protocol (>1.75 U/L), positive predictive value was 95% and negative predictive value was 70%.

Conclusion: Although TRAb measurement exhibited high specificity and sensitivity in the Graves' disease diagnosis there are still a certain percentage of poorly diagnosed patients. Since a fast and accurate diagnosis is imperative in order to prescribe the appropriate treatment as soon as possible and improve the patient's quality of life, the use of TSI measurement can accelerate and facilitate the diagnosis of Graves' disease and ensure timely therapy.

Keywords : Graves' disease, TSI, TRAb

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-046

Abstract Reference : 140

Prevalence Of Metabolic Syndrome And Risk Factors Among Employee Of Public Health Institution Gradiska

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Objective: To evaluate the prevalence and the individual components of metabolic syndrome (MetS) at employee of PHI "Dom zdravlja" Gradiška, BiH.

Methods: In this cross sectional study, 203 adult subjects (54 men and 149 women) aged between 20-65 years were included. The study was conducted in August and September 2017 on the regular check up of employees. The diagnosis of MetS was made according to the International Diabetes Federation (IDF) criteria-2005. Blood samples were collected after 10-12 hours overnight fasting and serum was obtained for biochemical analysis. The results of the biochemical analysis and anthropometric measurements were collected and statistically processed using the SPSS ver.20.

Results: The prevalence of metabolic syndrome according to IDF criteria was 40.39% (51.85% in men and 36.24% in women). Prevalence of increased waist circumference in the total sample was 69.9%, 41.4% for high systolic blood pressure, 26.6% for high diastolic blood pressure, 19.7% for elevated fasting blood glucose, 38.9% for low high density lipoprotein, and 37.4% for hypertriglyceridemia. Statistically significantly higher values ($p < 0.05$) in height, weight, waist circumference, arterial pressure, glucose and total triglycerides was observed in men. On the other hand, a statistically significant values of HDL-cholesterol was observed in women. Our results show that men had a higher percentage of subjects with 2 or more risk factors.

Conclusion: The prevalence and individual components of MetS in PHI "Dom zdravlja" Gradiska were high. The results of this work indicate the need to include screening of MetS parameters in routine testing as part of regular systematic checkup of the working age population. Screening of MetS is needed at national level to reduce the incidence of Type 2 diabetes mellitus (T2DM) and cardiovascular disease (CVD).

Keywords : Metabolic Syndrome, Prevalence, employee

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-049

Abstract Reference : 187

The Role Of Adipokines In The Risk Prediction Of Gestational Diabetes Mellitus

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Gestational Diabetes Mellitus (GDM) is a metabolic disorder characterized by any degree of glucose intolerance that is first recognized during pregnancy, in a woman with no history of diabetes prior to gestation. It affects 3-7% of pregnant women and increases the risk of complications both for the fetus/offspring and the mother. Although previous studies suggest that the insulin resistance during

pregnancy and GDM is presumably related to progressive alterations in the concentrations of hormones, including estrogen, progesterone and, human placental lactogen, recent evidence from clinical and experimental studies demonstrate that adipokines also play an important role in the pathophysiology of GDM.

The aim the present study is to investigate the role of interleukin-6 (IL-6), interleukin-1 β (IL-1 β), adiponectin, visfatin and, plasminogen activator inhibitor-1 (PAI-1) in the risk prediction of gestational diabetes.

Seventy pregnant women who attended to the Istanbul Faculty of Medicine, Division of Endocrinology and Metabolism were enrolled to the study. The study protocol was approved by the local ethics committee of Istanbul Faculty of Medicine. A detailed questionnaire and physical examination, including the measurement of weight and height were performed in all subjects. GDM was confirmed or ruled out by the two-step diagnostic strategy of the American Diabetes Association at 24-28 weeks and women were divided into two groups as GDM (n=40) and control (n=30). HbA1c was determined by cation-exchange high performance liquid chromatography. Serum concentrations of IL-6, IL-1 β , visfatin and, PAI-1 were measured by commercially available ELISA kits. The serum adiponectin level was determined by automated immunoturbidimetric assay. Mann-Whitney U-test and Spearman test were used for comparisons between the groups and correlation analyses respectively. Multiple linear regression analyses were carried out to investigate the determinant(s) of GDM taking maternal age, BMI, fasting glucose, HbA1c, IL-6, IL-1 β , adiponectin and PAI-1 as covariates.

In comparison to the controls the BMI and HbA1c% and, fasting glucose, IL-6, IL-1 β levels of patients with GDM were significantly higher whereas serum adiponectin and PAI-1 levels were significantly lower. While gestational age, adiponectin and, PAI-1 were negative, adiponectin and HbA1c were positively correlated in the controls HbA1c, IL-6 and BMI were positive, gestational age and IL-10 were negatively correlated in the patients with GDM. Adiponectin was found the only significant predictor of GDM in the logistic regression model predicting the GDM risk by using maternal age, BMI, fasting glucose, HbA1c, IL-6, IL-1 β , adiponectin and PAI-1 as covariates.

Our results show that the levels of adipokines and their associations have significant differences between women with and without gestational diabetes. Among adipokines, IL-6, IL-1 β , PAI-1 and, particularly adiponektin may be novel biomarker(s) for risk prediction of GDM.

Keywords: Gestational diabetes mellitus, adipokines, visfatin, plasminogen activator inhibitor-1, adiponektin

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-050

Abstract Reference : 191

The Effect of Pregestational Body Mass Index and the Rate of Gestational Weight Gain on Lipid Metabolism During Pregnancy

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Aim: Insulin sensitivity increases during early gestation leading to an increase in maternal fat deposits. In later pregnancy stage, depending on the physiological insulin resistance and maternal hypoglycemia, fat deposits are destroyed with the increase in the production of catecholamines. The changes have effects on the fetus.

It is postulated that in overweight and obese pregnant women, the effects on lipid metabolism are more prominent when the rate of weight gain in 2nd trimester is higher. This study investigates the relationship between pregestational body mass index (pBMI) and the rate of gestational weight gain (GWG) at the 2nd trimester with the biomarkers of lipid metabolism.

Materials and Methods: Sixty nine pregnant women followed at DEU between June 2016-November 2017 were included in this study. Glucose, insulin, total chol, triglyceride, HDL chol, LDL chol, adiponectin levels were measured at 11-14th and 24-28th weeks of pregnancy. The pregnant women were stratified according to their pBMI and the rate of GWG (kg/week) at the 2nd trimester based on the criteria recommended by the Institute of Medicine (IOM). For the statistical analysis, paired t test, sample t test and Mann Whitney U test were used on SPSS 23 program.

Results: The average age of pregnant women was 28.95 ± 5.15 . pBMI was <25 for 38 women and ≥ 25 for 31 women. The second trimester rate of GWG was normal in 22 women and high in 47.

For all pregnant women ($n=69$) the body weight at the 1st trimester was strongly correlated with the body weight at the 2nd trimester ($r=0.985, p<0.01$). The rate of GWG was significantly higher for the group with $pBMI < 25$, compared to the group with $pBMI \geq 25$ ($p < 0.01$).

Serum lipids were not significantly different between the groups with high or low pBMI at neither the 1st nor the 2nd trimester, but insulin and HOMA-IR levels were significantly higher ($p < 0.01$) at both trimesters in the group with higher pBMI. Triglyceride, total cholesterol, HDL, LDL and insulin increased significantly in the 2nd trimester compared to the 1st trimester for both groups ($p < 0.01$) while the increase in HOMA-IR was significant only for the group with low BMI ($p < 0.05$). There was no significant difference for glucose and adiponectin levels.

Serum lipids, insulin and HOMA-IR were not significantly different between the groups with high or normal GWG at neither the 1st nor the 2nd trimester. Triglyceride, total cholesterol, HDL, LDL increased significantly in the 2nd trimester compared to the 1st trimester for both groups ($p < 0.01$), but the increase of insulin and HOMA-IR in the 2nd trimester was significant only in the group with high GWG ($p < 0.01$).

No correlation was detected between the rate of GWG and biochemical parameters.

Conclusion: The changes in lipid parameters, insulin, HOMA-IR at the 2nd trimester were compatible with the changes in lipid metabolism and the development of insulin resistance. As expected, the rate of GWG at the 2nd trimester was low for the group with higher pBMI compared to group with normal pBMI, but still higher than the interval recommended by the IOM.

The fact that pregnant women with higher pBMI has significantly higher levels of insulin and HOMA-IR at both trimesters shows that for these women the development of insulin resistance is more prominent. The significant increase observed in insulin and HOMA-IR during the 2nd trimester in the group with high GWG rate points out that GWG rate also predisposes for metabolic alterations related to diabetes.

Keywords : pregestational body mass index; gestational weight gain; lipid metabolism; pregnancy.

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-051

Abstract Reference : 212

Relationship Between Thioredoxin And Thioredoxin-Binding Protein In Patients With Gestational Diabetes Mellitus

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This study examined the clinical and biological significance of thioredoxin (Trx) and thioredoxin-binding protein (TrxBP), which are redox-active proteins that control multiple biological functions, in gestational diabetes. We measured serum concentrations of Trx, TrxBP, insulin and other blood parameters, as well as insulin resistance and glucose tolerance in pregnant women with or without gestational diabetes mellitus (GDM) (34/34) at the early second trimester. Contrary to diabetes patients, serum TrxBP levels were lower in women with GDM than healthy pregnant controls. The serum insulin concentrations were higher in GDM, but the difference was not statistically significant. Furthermore, the intracellular redox potential ratio (Trx/TrxBP) of GDM patients was higher than that of the control group. During pregnancy, the mother is potentially subjected to glucotoxicity as well as oxidative stress (OS) to help the foetus absorb more nutrients. Our results suggest that the Trx/TrxBP system may mediate a compensating mechanism. Reduced TrxBP levels and consequent enhanced Trx activity may alleviate OS and protect the foetus from hypoglycaemia. We hypothesise that the decrease in TrxBP levels is not a consequence of GDM, but rather is an instance of the active functional role of TrxBP in maternal development, unifying redox regulation and glucose metabolism

Keywords : Gestational diabetes, glucose metabolism, oxidative stress, thioredoxin, thioredoxin-binding protein

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-052

Abstract Reference : 216

Thioredoxine System with Coronary Artery Disease in Type 2 Diabetes Mellitus

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Several new genes and proteins have been discovered to date to elucidate the pathogenesis of Type 2 Diabetes Mellitus (DM) and atherosclerosis. These include proteins from the Thioredoxin System, which are active in pancreatic beta cells. In this study, the relation between Thioredoxin System (Thioredoxin and Thioredoxin Reductase) and Thioredoxin-Interacting Protein levels and serum lipid levels are investigated in patients diagnosed with type 2 DM and Coronary Artery Disease (CAD) by coronary angiography and compared with those who have no CAD. Eighty-nine participants undergoing elective coronary angiography (CAG) were divided into DM + CAH, CAD alone and control groups. Demographic and clinical profiles, serum thioredoxin system protein concentrations, lipid profiles, some biochemical and hormonal parameters were compared in three groups. Diabetes mellitus group had low systolic cardiac function (LVEF%) and high CAD prevalence score ($p < 0.001$). There was no difference between the groups in terms of thioredoxin system protein and TXNIP levels. Lipid profile, insulin resistance were not different between the groups. Serum uric acid and creatinine levels in the diabetic

group were higher than the other groups ($p=0.011$ and $p=0.029$). No significant difference was found between the groups in other biochemical and hormonal parameters. There was a significant positive correlation between thioredoxin system proteins and TXNIP ($p < 0.001$). The high prevalence of CAD in the DM group is associated with the macrovascular complication of diabetes and the low percentage of LVEF associated with diabetic cardiomyopathy. No significant differences between the groups in terms of proteins and TXNIP concentrations and lipid profiles of the thioredoxin system were found to be incompatible with previous findings of lipid oxidation and oxidative stress markers in atherosclerotic pathogenesis.

Keywords : Thioredoxin, Thioredoxin Reductase, Thioredoxin-Interacting Protein, Coronary Artery Disease, Oxidative Stress

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-053

Abstract Reference : 220

Higher Serum Lipids And Oxidative Stress In Patients With Normal Tension Glaucoma, But Not Pseudoexfoliative Glaucoma

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This study entailed a cross-examination of oxidant/antioxidant balance, high-density lipoprotein (HDL)-linked paraoxonase 1 (PON1) phenotypes, and levels of serum routine lipids among patients with normal tension glaucoma (NTG) or pseudoexfoliative glaucoma (PEXG) compared with healthy control groups. We aimed to investigate the links between oxidative stress (OS), HDL-related antioxidant enzyme activities and dyslipidemia in distinct subtypes of glaucoma. The study included 32 patients with NTG, 31 patients with PEXG, and 40 control subjects. Levels of PON1 and arylesterase enzymatic activity, total oxidant status (TOS), and total antioxidant status were measured by spectrophotometry and OS indexes (OSI) were calculated. The phenotype distribution of PON1 was determined using the dual substrate method. Blood serum levels of HDL, low-density lipoprotein, total cholesterol (TC), and triglyceride (TG) were measured. The TOS and OSI values in the NTG group were significantly higher compared with the other groups (both $p < 0.01$). The phenotype distribution found in the glaucoma and control groups were NTG: QQ, 59.4%; QR, 37.5%; RR, 3.1%; PEXG: QQ, 45.1%; QR, 48.4%; RR, 6.5%; and in the control group: QQ, 42.5%; QR, 50.0%; RR, 7.5%. Serum TC levels were significantly higher than the control in both NTG and PEXG groups, whereas TG was significantly higher in NTG only ($p < 0.01$ and $p < 0.02$, respectively). Hyperlipidemia, OS and variations in phenotype distribution of PON1 may play a role in the pathogenesis of different types of glaucoma.

Keywords : Oxidative stress, paraoxonase, high-density lipoprotein, hyperlipidemia, normal tension glaucoma, pseudoexfoliative glaucoma, paraoxonase 1 phenotype

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-054

Abstract Reference : 224

The Relationship Between Serum Ferritin Levels And Serum Lipids And HDL Function With Respect To Age And Gender

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Elevated serum ferritin (SFer) levels have been associated with chronic diseases such as coronary heart disease and diabetes mellitus type 2. The aim of this study was to examine the relationship between SFer levels and serum lipid parameters, and how this relation changes in terms of age and gender. Additionally, we investigated a possible relationship between SFer levels and high-density lipoprotein (HDL) function. SFer levels and lipid panel (total cholesterol (TC), triglyceride (TG), low-density lipoprotein-cholesterol (LDL-C) and HDL-C) of 4205 people (3139 women, 1066 men) were examined retrospectively. Study population was classified according to age and gender. Separately, 100 subjects (52 women, 48 men) were randomly recruited to investigate the relation between SFer levels, and HDL dependent paraoxonase-1 (PON1) and arylesterase (ARE) activities. In all age groups, women's SFer levels were found to be significantly lower and HDL-C levels significantly higher compared to men. In the 50-70 ages range, TC and LDL-C levels of women were found to be significantly higher than those of men (P < 0.01). SFer levels tended to increase with age in women. Correlation analyses revealed a negative correlation between levels of SFer and HDL-C, while positive correlations existed between levels of SFer, and TC, TG and LDL-C. There was no significant correlation between SFer levels and PON1 or ARE activities. The finding that increased SFer levels are accompanied by increased serum TC, TG and LDL-C levels may help us to explain the increased risk of metabolic disorders and cardiovascular disease in postmenopausal women.

Keywords : Ferritin, Lipid metabolism, Paraoxonase, Arylesterase, HDL, LDL

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The Importance of Measurement Uncertainty for Gestational Diabetes Mellitus Screening

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Aim: Gestational Diabetes Mellitus (GDM) is defined as any glucose intolerance with the onset or first recognition during pregnancy. This definition helps for diagnosis of unrecognized pre-existing diabetes also. The International Association of Diabetes and Pregnancy Study Groups (IADPSG) recommend that the 75 g glucose tolerance test (GTT) can be used as a GDM screening test. GTT is done in the fasting state using 75 g of glucose at 24-28 weeks and GDM diagnosed if any one of the following cut-offs is met 1-hour ≥ 180 mg/dl (≥ 10 mmol/l) or 2-hour ≥ 153 mg/dl (≥ 8.5 mmol/l) according to IADPSG criteria. The aim of our study is to assess the effect of reporting the measurement uncertainty values of the glucose test for GDM screening.

Materials and Methods: Glucose test results of pregnant women who had 75 g OGTT in İzmir Kemalpaşa State Hospital between September 2017 and February 2018 were analyzed retrospectively. In our

laboratory, the concentration of glucose was measured by glucose oxidase method in autoanalyzer (Konelab60i; Thermo Fisher Scientific Inc. MA, USA). The measurement uncertainty was calculated according to Nordest technical report 537 using internal and external quality control data.

Result: The internal quality control uncertainty values of glucose test is 2,51%, external quality uncertainty value is 2,9% and extended uncertainty values is 7,52% (at 95% confidence interval). 75 g OGTT test was performed on 172 pregnant women in 6 months period. The number of pregnant women who were diagnosed with GDM was 20 (1-hour glucose of 8 gestations was ≥ 180 mg/dl (≥ 10 mmol/l), and 2-hour glucose of 12 gestations was 153mg/dl (≥ 8.5 mmol/l)) according to 75 g OGTT. GDM ratio is 11.63% (20/172). When the evaluation was done considering the measurement uncertainty, it was found that 7 of the 20 pregnant women diagnosed with GDM according to 75 g OGTT test could be false positive and 8 false negative diagnosis.

Conclusion: It is even more important to calculate and report the measurement uncertainty value for the tests assessed with cutoff.

Keywords : Measurement uncertainty, Gestational Diabetes Mellitus, Oral Glucose Tolerance Test

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Blood Glucose Levels And Total Antioxidant Capacity

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Aim: Increased oxidative stress is responsible for the etiology of many diseases. Some studies have suggested that oxidative stress due to glucose elevation in diabetic patients was increased. In this study, we aimed to investigate the relationship between blood glucose levels and total antioxidant capacity in patients who were requested oral glucose tolerance test.

Materials and Methods: Twenty-nine patients were included in this study. A three-hour oral glucose tolerance test was performed in this patients. Serum glucose, total antioxidant capacity, total cholesterol and triglyceride levels were studied in these samples taken from these patients. These samples were divided into four groups according to their blood sampling time as group 1 (basal), group 2 (1. Hour), group 3 (2. Hour) and group4 (3. Hour). Tests were studied in the Abbott Architect C 16000 autoanalyzer by enzymatic end-point (glucose, cholesterol, triglyceride) and ABTS (total antioxidant capacity) method.

Results: Mean glucose levels (mg/dl) in these groups were 98 ± 16 , 152 ± 49 ; 127 ± 50 , 87 ± 26 ; mean total antioxidant levels (mmol Trolox Equiv./L) were 1.78 ± 0.29 , 1.85 ± 0.34 , 1.76 ± 0.28 , 1.79 ± 0.29 ; mean total cholesterol levels (mg/dl) were 214 ± 36 , 205 ± 33 , 207 ± 34 , 210 ± 36 and mean triglyceride levels (mg/dl) were 145 ± 69 , 142 ± 68 , 134 ± 65 , 133 ± 59 , respectively.

Conclusion: In this study, no statistically significant difference was found between the total antioxidant capacity levels of the groups. In addition, no significant correlation was found between serum glucose levels and total antioxidant capacity. Changes in blood glucose levels at physiological limits did not effect the blood total antioxidant capacity at any given time.

Keywords : total antioxidant capacity, serum glucose levels

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Evaluation of Vitamin D Test Seasonal Changes of Year 2017

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Aim: Vitamin D [25(OH) D] is a steroid hormone that is synthesized by ultraviolet light from 7-dehydrocholesterol. Serum vitamin D levels apart from their effects on calcium and phosphorus metabolism have recently been associated with heart disease, diabetes, depression, cancer and infection. In our study, it was aimed to compare the monthly average of the 25 (OH) D sample results measured in the Manisa Celal Bayar University Hafsa Sultan Hospital Core Laboratory Setting and to investigate the effect of the seasonal changes on the results.

Materials and Methods: The results of the 25 (OH) D tests(n=22863) were obtained from the laboratory information system assessed in the Cobas e411 auto analyzer (Roche, Tokyo, Japan) between January and December 2017 at Manisa Celal Bayar University Hafsa Sultan Hospital Core Laboratory in Manisa, Turkey. Mean results of samples per month and season were evaluated by t-test and ANOVA test.

Results: When the seasonal results of 25 (OH) D were examined, there were significant differences between groups. The highest to lowest mean values of 25 (OH) D results were found in autumn (21.61 ng/mL), summer (20.78 ng/mL), winter (20.00 ng/mL) and spring (18.25 ng/mL).

Results of 25 (OH) D were evaluated on a monthly basis, the highest mean result were found in August (23.55 ng/mL) and September (23.13 ng/mL), the lowest mean result was in April (16.74 ng/mL).

When we look at the six-month periods, it is seen that the mean values in summer and autumn groups (21.20 ng/mL) are higher than winter and spring groups (19.00 ng/mL) and this difference is statistically significant (p <0.05).

Nevertheless, summer-autumn group mean results were below 20 ng/ mL and winter-spring groups mean results were below 30 ng/mL.

Conclusions: In the literature, values below 20 ng / mL indicate vitamin D deficiency and values between 21-29 ng/mL as vitamin D insufficiency. Although Turkey is in a geographical location with abundant sunlight when monthly and seasonal changes are examined, low mean results obtained below the reference values indicate that vitamin D insufficiency may be a major health problem.

Keywords : 25 OH Vitamin D, Vitamin D deficiency, Vitamin D insufficiency

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P-058

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Relationship Between D Vitamin and Ankylosing Spondylitis

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Aim: Ankylosing spondylitis (AS) is an inflammatory disorder that presents with arthritis of the axial skeleton, including sacroiliac joints. In AS, the pathological process is that of inflammation and

ossification with evidence for accelerated bone loss. Therefore vitamin D may play a role in the development and progression of disease. The aim of this study is to determine D vitamin levels in AS patients and the relationship between D vitamin levels and AS disease activity.

Materials and methods: Thirty-five AS patients and 35 healthy volunteers were included in this study. 25-(OH)D₃, C-reactive protein (CRP), triglyceride, total cholesterol, low-density lipoprotein (LDL) and high-density lipoprotein (HDL)-cholesterol levels of all participants were measured. The disease activity was evaluated by Bath Ankylosing Spondylitis Disease Activity Index (BASDAI).

Results: The mean age of the subjects was 42 ± 12 years. The 25-(OH)D₃ levels of patient and control groups were 15±9 ng/mL, 17±8 ng/mL, respectively. The differences in the 25-(OH)D₃ level between the patient and the control groups were not statistically significant. Significant positive correlation was found between BASDAI and CRP levels. The correlation between BASDAI and serum 25-(OH)D₃ levels did not reach a statistically significant level in patients with AS.

Conclusion: In our study, vitamin D did not significantly associated with disease activity. In literatures, it has been reported that AS is associated with lower vitamin D concentrations and low vitamin D concentrations are associated with higher disease activity. The role of vitamin D in AS is largely unknown. Further studies are in need to determine if a causative link exists between vitamin D and AS. Because, treatment in AS is mainly symptomatic and few drugs actually slow the disease process. Vitamin D may be a new or adjunctive treatment option for AS.

Keywords : Ankylosing spondylitis, D Vitamin, BASDAI

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P-059

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Neuropeptides : α -MSH, AgRP

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Appetite and metabolism of regulation play a critical role in the complex neuroendocrine system operation for the life. Human beings are in to appetite control, weight loss-gain. Sufficient and well balanced nutrition helps the body for its energy homeostasis. The Cocaine and Amphetamine-regulated transcript peptide and Melanocortins such as alpha-melanocyte-stimulating hormone (α MSH) are anorexigenic and increase energy expenditure. Melanin-concentrating hormone, neuropeptide Y and endogenous melanocortin receptor antagonist agouti-related protein (AgRP) are orexigenic-appetite stimulant and anabolic peptide. Circulating levels of α MSH and AgRP of which the potential role especially in adolescence malnutrition or being fat have been studied lately. The study has been aimed to investigate the differences in the levels of these peptides with respect to body mass index (BMI), insulin, and homeostatic model assessment of insulin resistance (HOMA-IR). This term has been demonstrated for evaluated beta cell function and insulin resistance. HOMA is a feature of risk cardio-metabolic syndrome, fatty liver disease, diabetes mellitus. Also BMI reaches in childhood, known as the adiposity rebound (AR). Earlier AR is associated with a higher risk of cardio-vascular diseases in later life. To eat unhealthily in early life has an effect into the relationship between childhood adiposity and later obesity and cardio-metabolic risk. The study groups have been comprised of two groups of normal to over-weight people. It was concluded that differences were not found between normal or overweight adults relating to AgRP levels but α MSH levels were decreased in overweight adults than in normal weight others. HOMA-IRs were positively correlated with glucose and insulin levels in groups. It appears that α MSH levels could be helped understand the metabolic regulation and energy balance. Further research in the area would lead to the development of new treatment strategies for weakness and obesity. The interaction between

appetite, dietary behaviour and skills in childhood, adolescence and adulthood have influence on growth, maintain health and normal bodily functions are of interest in the world population. People require sufficient nutrients to support the immune system and to help the body maintain health bodily functions. Appetitive hormones circulating levels of alpha-melanocyte-stimulating hormone (α -MSH) and agouti-related protein (AgRP), and the potential role of these proteins in malnutrition and obesity, have been studied lately. We hope this study will be useful for our colleagues.

Keywords : Neuroendocrine, HOMA-IR, Adults

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P-060

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First Trimester Maternal Thyroid Stimulating And Free Thyroxin Reference Ranges

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Aim: To establish maternal thyroid-stimulating hormone (TSH) and free thyroxin (FT4) reference ranges for first trimester screening from 11 + 0 to 13 + 6 weeks of gestation.

Material and Methods : A total of 3084 singleton pregnant women who underwent simultaneously prenatal first trimester Down's syndrome screening and thyroid function screening from January 2017 to December 2017 were included in the study. Women with positive antithyroid peroxidase antibody (TPOAb) were previously excluded. TSH and FT4 were measured by immunochemiluminescent assay on Beckmann Coulter DXI800 analyzer. Nonparametric percentile method (also known as CLSI C28.A3) was used for the determination of reference ranges.

Results: We established reference ranges of TSH for the period of gestation from 11 + 0 to 13 + 6 weeks of pregnancy as TSH 0.15-4.69 mU/L and FT4 7.66-14.86 pmol/L for singleton pregnancies. The median (IQR) of TSH for singleton pregnancies was 1, 53 mU/L (0.01- 9.57) and FT4 11.65 pmol/L (5.33-14.99).

Conclusions : Each first trimester screening center should be aware of which type of immunoassay their laboratory uses. TSH and FT4 reference ranges in women during the first trimester of pregnancy and for general population have no differences.

Keywords : Gestation, Immunoassay, Pregnancy, Reference interval, Thyroid disease

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P-061

Abstract Reference : 345

The Effects of Dietary and Exercise Therapy on Some Biochemical Parameters and Semaphorin 3E in Obese and Non-Obese Patients¹²

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Objective: In this study, we aimed to examine the effects of dietary and exercise therapy on some biochemical parameters and SEMA 3E in obese and non-obese patients

Material and Methods: 37 patients who applied for Eskişehir Private Fora Physical Therapy and Rehabilitation Center between 01.11.2017-30.05.2018 were included in the study. Patients were divided into 3 groups according to body mass index (BMI) and diet and exercise therapy were applied for 8 weeks. Fasting blood glucose, triglyceride, total cholesterol, HDL, LDL, HsCRP, fasting insulin levels were measured with Rosche COBAS C501 autoanalyzer in Eskisehir Osmangazi University Clinical Biochemistry Laboratory. Semaphorin-3E and Plexin-D1 serum levels were measured by enzyme-linked immunosorbent assay (ELISA). All values were evaluated before and after treatment.

Results: There was a statistically significant difference between fasting blood glucose and triglyceride levels measured at the beginning of the study and the values measured at the end of the 8-week diet and exercise treatment respectively ($p<0.05$), ($p<0.001$). Although there was a statistically significant difference in the measured glucose values between the groups ($p<0.05$), there was no statistically significant difference between the groups in triglyceride values. ($p>0.05$). There was a statistically significant difference between the fasting insulin values 13.07 ± 6.11 and 9.53 ± 5.82 ($p<0.001$) and the HOMA-IR values 2.98 ± 1.63 and 2.15 ± 1.63 ($p<0.001$) measured at the beginning of the study and at the end of 8 weeks. There were no significant differences in the triglyceride, HDL, HOMA-IR values between the groups according to BMI values. The HsCRP level showed a statistically significant difference between the groups according to the degree of obesity ($p<0.05$). However, there was no statistically significant difference in HsCRP value as a result of diet and exercise treatment ($p>0.05$). There was a statistically significant difference between the beginning of the study and the SEMA 3E values measured after 8 weeks of diet and exercise therapy ($p<0.05$). However, there was no statistically significant difference between the Sema3E values among the groups ($p>0.05$). There was no statistically significant relationship between insulin resistance and SEMA 3E levels ($p>0.05$). There was no statistically significant difference between the beginning of the study and the Plexin D1 values measured at the end of the 8-week diet and exercise treatment ($p>0.05$).

Conclusion: According to our results, fasting blood glucose, triglycerides, HOMA-IR values of both obese and non-obese patients were reduced as a result of diet and exercise therapy. HDL levels increased with diet and exercise therapy regardless of body mass index. Sema3E levels increased after 8 weeks of treatment regardless of body mass index. We can say that SEMA 3E levels may be increased by a protective mechanism to reduce insulin resistance.

Keywords : Obesity, Insulin resistance, SEMA 3E, Plexin D1

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P-062

Abstract Reference : 15

Interplay of Adipokines in the Management of Essential Hypertension

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Objective: The renin-angiotensin-system (RAS), endothelial dysfunction and sympathetic nervous system have been shown to be risk factors of hypertension. The study sought to elucidate the interplay of these risk factors and specific adipokines in the management of hypertension.

Methodology: A comparative cross-sectional study, in which two hundred (200) confirmed hypertensive patients from the hypertensive Unit of the Komfo Anokye Teaching Hospital(KATH) and 50 age-matched normotensives were recruited into the study. Participants blood pressures and anthropometric as well as their sociodemographic and treatment information were voluntarily obtained. Serum levels of adiponectin, leptin and resistin of the participants were quantified using the enzyme-linked

immunosorbent assays(ELISA). Routine chemistries of samples were performed to assess the renal function, lipid profile and glycaemic status of all subjects. Data was entered into Microsoft excel and analyzed using GraphPad Prism version 6. P-value less <0.05 were considered statistically significant

Results: The studied hypertensive patients showed a significantly higher anthropometric indices of adiposity compared to their normotensive counterparts, CI ($p<0.0001$), BAI ($p<0.0001$) and AVI ($p=0.002$). Adiponectin levels ($p<0.0001$) were significantly lower in the hypertensive subjects relative to the normotensives. Furthermore, significantly higher concentrations of serum leptin ($p=0.016$) and the leptin-adiponectin ratio ($p=0.001$) were observed among the hypertension patients compared to the normotensive participants. The study further observed a direct association between serum leptin and weight ($r=0.111$, $p=0.022$), BMI ($r=0.129$, $p=0.009$) and WHtR ($r=0.098$, $p=0.045$) but inverse relationship with height ($r=-0.134$, $p=0.006$) among the hypertensive patients. Serum leptin has a significant inverse correlation with HDL-C among the hypertensive patients ($r=-0.174$, $p=0.013$). The fully adjusted odds ratios for hypertension as predicted by resistin and adiponectin were 1.128(95% CI, 1.020-1.247); $p=0.019$) and 0.933(95% CI, 0.909-0.953); $p=0.0001$) respectively.

Conclusion: We confirm that hypertensive patients have significantly increased plasma levels of leptin and resistin and lower levels of plasma adiponectin as compared to normotensive subjects. It is evident from this study that elevations in serum levels of leptin and resistin will concomitantly influence the risk factors of essential hypertension and therefore affect its management.

Keywords : Adipokines, Hypertension, Leptin, Adiponectin, Resistin

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P-063

Abstract Reference : 66

Advantages And Pitfalls Of Glucometers: Implications For Care Monitoring And Therapeutics.

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Aim: Glycemia often chosen to be monitored by glucometers over clinical chemistry laboratory glucose provides easiness in generating immediate results. With glucometers, glycemia results are not altered by *in vitro* glycolysis observed when blood is routed towards laboratory and subject to delayed analysis. Whereas avoiding this false decrease in glucose determinations, glucometers have, however, also some limits as regards to their specificity and hence subjection to interferences owing to their detection technology. Whereas glucose measurements in laboratory's bench rest on a standard hexokinase-based colorimetric technique, most glucometers use an amperometry method coupled to a set of oxidoreductions (OR) initiated by either glucose dehydrogenase or glucose oxidase. Amperometry itself is based on oxidation of a revelator previously reduced at the issue of the enzyme reaction system starting with glucose as a substrate. Therefore, several steps encompassed by the glucometer apparatus and associated stick's reactions may be affected by interferences with OR balances and hence glucose concentration values. In agreement, literature already reports a major practical glucometer interference with ascorbic acid responsible for a false rising of glycemia values and inadequate monitoring.

Materials and Methods: We aimed at evaluating drug interferences with glucometers from 3 main manufacturers: Abbott, Roche and Nova. These glucometers have different enzyme and cofactor requirements to measure glucose levels. Drugs chosen have a redox potential overlapping those of

components already present in the basal glucometer system before use. The main goal of our study is to understand and identify redox mechanisms involved in these interferences to circumventing them, providing glucometers with a better specificity towards glucose and improving patient therapeutics. Blood samples were selected for pH, glucose and hematocrit levels to evaluate the impact of these parameters on drug interferences.

Results: Our preliminary data indicate interferences by antioxidants or reductants including ascorbic acid, acetylcysteine and glutathione, on glucometers using glucose dehydrogenase and NAD⁺, as enzyme and cofactor, respectively. For interfering mechanisms, drugs are hypothesized to alter balance of NAD⁺/NADH + H⁺ redox couple or its associated with other redox couple in the glucometer system. As a result, exaggerated electron transfer through these redox couples and excess electrons delivered to amperometer with overestimation by glucometer of glucose levels are suggested. These hypothetic mechanisms are currently under investigations with *in vitro* experiments monitoring reduction rates of NAD⁺ by spectrophotometry under increasing concentrations of interfering drugs.

Conclusion: Some countries still consider glucometers as falling outside the scope of clinical chemistry. Choice and use of glucometers are mainly based on manufacturer recommendations and costs. It is important in the same time that glucometers properly and specifically accounts for real glucose values. Here, we have found some yet previously unreported interferences. In fact, by prompting recognition of these interferences, our approach of clinical chemists appears to be essential in glucometer management, data analyses, mechanistic expertise and proposal for future improvement.

Keywords : Glucometers, interferences, drugs, oxydo-reduction potential

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P-064

Abstract Reference : 70

Evaluation Of The Relationship Between Bioavailable Vitamin D and Remnant Cholesterol in Type 2 Diabetes Mellitus Patients

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Aim: The rate of triglyceride-rich lipoprotein increases in diabetic patients. The cholesterol content of triglyceride-rich lipoproteins is called remnant cholesterol (fasting VLDL, IDL, additionally nonfasting chylomicron and their remnants). Vitamin D deficiency associated with insulin resistance, atherogenic lipid profile and the risk of developing coronary artery disease. 99% of the vitamin D in circulation is transported in dependence on VDBP and albumin and bioavailable vitamin D is defined as albumin-bound and free-form. The aim of our study was to determine the association between bioavailable vitamin D and remnant cholesterol in Type 2 Diabetes Mellitus (T2DM) patients.

Materials and methods: Our study was designed as a cross-sectional study and was carried out between November 2015 and December 2017. Our study group consisted of two groups of 406 volunteers with T2DM and control group. Samples were taken in the fasting state. By questioning the demographic characteristics and drug use, subjects using lipid-lowering treatment were not included in the study. The diagnosis of Type 2 Diabetes Mellitus was made according to ADA 2016 criteria. Classification of vitamin D levels was done according to the Endocrine Society.

Results: HDL, 25(OH)D, free vitamin D and bioavailable vitamin D levels were significantly lower in diabetic patients than in non-diabetic patients while triglyceride, remnant cholesterol and CRP levels were found to be significantly higher. Remnant cholesterol was negatively correlated with vitamin D, free vitamin D and bioavailable vitamin D in non-diabetic patients and this relationship was impaired in the presence of T2DM. Furthermore, in non-diabetic individuals, CRP was positively correlated with triglyceride, remnant cholesterol, and nonHDL. But this relationship has not been established in patients with Diabetes Mellitus. VDBP was positively correlated with CRP and remnant cholesterol in diabetic patients, but not in non-diabetic patients.

Cut-off values were determined from non-diabetic volunteers: 3,56 ng / mL for bioavailable vitamin D and 26,56 mg / dL for remnant cholesterol. In the control group, remnant cholesterol concentrations were found above the cut-off value at 41,2% of individuals with low bioavailable vitamin D and 24,3% with high bioavailable vitamin D. But there was no significant relationship was found in DM group. Logistic regression analysis showed that for increasing remnant cholesterol above the cut-off value, the odds ratio was determined as 2 for bioavailable vitamin D and 1,1 for CRP. But in T2DM, there was no significant relationship for variables. It was observed that in all subjects, bioavailable vitamin D increased the remnant cholesterol cut-off by 2,19 fold; independent of diabetes. However, there was no significant risk for 25(OH)D insufficiency.

Conclusion: Low bioavailable vitamin D was found to be a risk factor for elevated remnant cholesterol. However, this relationship was not detected in patients with Diabetes Mellitus. We believe that the inflammation observed in Diabetes Mellitus may increase the concentrations of VDBP and a decrease bioavailable vitamin D levels. Therefore, the bioavailable vitamin D calculated by VDBP, can be useful for clarifying the true vitamin D status.

Keywords : Type 2 Diabetes Mellitus, Vitamin D, Bioavailable Vitamin D, Remnant Cholesterol, Vitamin D-Binding Protein

Endocrinology and Metabolism

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P-065

Abstract Reference : 90

Leukocytosis And Biochemistry Parameters Interferences: Can We Still Interpret Biochemistry Reports Without Hematology?

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Aim: In literature, extreme leukocytosis can cause fluctuations in some biochemistry parameters, significantly disturbing their values and thus leading to misinterpretation. We want to show that even moderate values of leukocytosis can influence these parameters and have consequences on patient care. Studied parameters are kalemia, glycemia and blood gases.

Materials and methods: Samples were sent to the laboratory by pneumatic tube system. For kalemia evaluation, data were extracted from our biochemistry emergency department laboratory test results. We focused on patients with both leukocytosis $>15 \times 10^9/L$ and elevated plasma potassium >5.0 mmol/L with concomitant whole blood potassium using direct potentiometry or serum potassium on clot activator tube before any hypokalemic treatment. For glucose and blood gases parameters, we evaluated the stability of whole blood samples at room temperature and the impact of leukocytosis in 2 different groups (low leukocytosis $<15 \times 10^9/L$ and moderate leukocytosis $>15 \times 10^9/L$).

Results: Pseudohyperkalemia caused by extreme leukocytosis has been well documented, especially in patients with lymphoproliferative diseases. Potassium is released from the fragile and numerous leukemic cells into the plasma. Here we described cases of spurious kalemia with moderate leukocytosis ($>15 \times 10^9/L$) with or without hemopathy. We also evaluated the stability of blood gases parameters according to leukocyte levels. We observed a higher decrease of pH with moderate leukocytosis but no difference on other parameters (pCO₂, pO₂, HCO₃) suggesting another mechanism to explain this higher decrease of pH such as lactic acid production. Fictitious hypoglycemia was related to *in vitro* glucose consumption by leukocytes. Our results show that *in vitro* glucose consumption is linked to the level of leukocytes. Many hospital laboratories do not use glycolysis inhibitors, which could lead to factitious hypoglycemia or normoglycemia. Moreover, in our study, we reported the case of a child with major leukocytosis ($800 \times 10^9/L$) leading to a false increase in plasma potassium and an unexpected spurious decrease in natremia leading to inappropriate therapeutic measures. When white blood cells and blasts count decreased, ionic interferences disappeared.

Conclusion: Inability to prevent or to detect early spurious biochemistry disorders may have led to inappropriate medical interventions, with a substantial iatrogenic risk in patients. Moreover, this phenomenon could be underestimated in our study because spurious biochemistry measurements leading to results within reference range were not taken into account. To detect these spurious disorders, biologists need to interpret biochemistry reports while taking into account white blood cell count.

Keywords : interferences, biochemistry, leukocytosis, factitious results

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P-066

Abstract Reference : 165

How Should We Assess The Glycemic Status In People With Hemolytic Anemia?

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Hemoglobin A1c (HbA1c) is defined by the International Federation of Clinical Chemistry working group as hemoglobin that is irreversibly glycated at one or both N-terminal valines of the beta chains. HbA1c is a fast, simple and objective test used in the diagnosis and follow-up of patients with diabetes. HbA1c has entered diagnostic criteria for diabetes and has begun to be used as an important marker in evaluating the efficacy of treatment. Because this test shows a mean blood glucose concentration of 3-4 months, it can lead to false clinical evaluations when the erythrocyte life is increasing or decreasing.

A 50-year-old male patient is admitted to the internal medicine clinic with complaints of weakness, rash and pain triggered by cold on the hands and feet. Physical examination revealed cyanosis on fingertips and livedo reticularis. The patient was diagnosed with autoimmune hemolytic anemia 20 years ago, had undergone splenectomy and was treated with steroid therapy. Chemistry tests: Haptoglobin: 1.2 mg/dL (30-300), glucose:121 mg/dL (74-100), total bilirubin 1.51 mg/dL (0.3-12), AST: 59 U/L (0-50) , LDH: 600 mg/dL (0-248). Complete blood count: Hemoglobin: 11.9 g/dL (13-17), erythrocyte $2.06 \times 10^6/uL$ (4.5-5.9), reticulocyte percentage: %11.35 (%0.60-2.71). Direct and indirect coombs tests were positive. There were polychromatic areas in the peripheral blood smear. Blood was drawn for the HbA1c test because the patient was diabetic and using antidiabetic drugs. The HbA1c result was %2.5 (4.3-6.1). The HbA1c values of the patient in the past 12 months were %5.8, %2.9, %4, %10.8, respectively. It was thought that HbA1c did not reflect the mean blood glucose concentration because the patient's hemolytic anemia and erythrocyte life were shortened. The fructosamine test, which reflects the average 1-month blood glucose concentration values as a reflective test, was requested. The fructosamine result was 270 $\mu\text{mol/L}$ (118-262). Variant analysis was performed against the possibility of interference due to the

measurement method and no variant was detected. The clinician was told that the HbA1c result would be incorrect because the patient's erythrocyte life was getting shorter and it would be right to follow up with the fructosamine to evaluate the patient's glycemic status.

HbA1c does not show the correct glycemic status when the erythrocyte life is decreasing or increasing. In these cases, the laboratory specialist may request fructosamine as a reflective test and may perform variant analysis against interference. Knowing that HbA1c may be affected by preanalytical and analytical processes and interpreting the results will create a strong dialogue between the clinician and the laboratory specialist and to prevent unnecessary treatment to the patient.

Keywords : HbA1c, autoimmune hemolytic anemia, fructosamine

Endocrinology and Metabolism

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P-067

Abstract Reference : 420

2-Amino adipic and 2-Keto adipic Aciduria: Case Report

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Aim: 2-Amino adipic and 2-Keto adipic aciduria are inborn errors of lysine, tryptophan and hydroxylysine metabolism. A defect in the alpha-keto adipic acid (KAA) dehydrogenase complex is thought to be responsible. To date more than 20 cases have reported with 2-amino adipic aciduria. While most of them were asymptomatic others have developed mild to severe intellectual disability, muscular hypotonia, developmental delay, ataxia, and epilepsy

Material and Methods: Our case was a girl who was born spontaneously with a weight of 1385g, a size of 27cm and a head circumference of 35cm. Her birth week was unknown and she was evaluated as premature. She had a brachycephaly appearance, hypertelorism and hypotonia. In the first days of life, numerous fractures occurred in the lower and upper extremities, and intubation and CPR were also performed because of spontaneous respiratory arrest.

Results: Renal function tests were normal and ammonia levels were high in patients' follow-up. In the acylcarnitine profile, the level of C6 was high. Isolated C6 height was thought to be dietary, not metabolic. In urine organic acid analysis at different times, 2-OH adipic acid, adipic acid, fumaric acid, 3-OH butyric acid, 3-OH isobutyric acid, 3-OH isovaleric acid, 2-OH isovaleric acid, ethylmalonic acid, 2 methyl 3-OH butyric acid and 2-ethyl 3-OH propionic acid excretions were found in the urine. In quantitative urinary amino acid analysis, 2-amino adipic acid (2013.27 $\mu\text{mol}/\text{gr}$ creatinine, normal: 0- 180), lysine (5585.92 $\mu\text{mol}/\text{gr}$ creatinine, normal: 0- 1850), leucine, valine, glutamic acid, threonine, alanine, serine, glutamine, cystine (1615.2 $\mu\text{mol}/\text{gr}$ creatinine, normal: 0- 668), arginine, cystathionine and ornithine levels were found to be higher. In quantitative serum amino acid analysis, similar to urine amino acid analysis, 2-amino adipic acid (13.3 $\mu\text{mol}/\text{L}$, normal: 0- 1), leucine, lysine, valine, cystathionine, ornithine and in addition, isoleucine was found to be high. No pathology was found in the imaging.

Conclusion: High 2-OH adipic acid levels in quantitative urine and serum amino acid analyzes and 2-amino adipic acid in urine organic acid analysis and abnormal phenotypic patterns, suggesting the possibility of 2-amino adipic aciduria / 2-keto adipic aciduria, a rare disease with very variable phenotypic features. Again, the fact that the patient has a numerous bone fractures makes us think of osteogenesis imperfecta disease. Patients were referred to genetic counseling. Molecular genetic analysis will establish definite diagnosis.

Keywords: 2-Amino adipic Aciduria, 2-Keto adipic Aciduria, Osteogenesis Imperfecta Disease

A Different Approach To The Differential Diagnosis Of Hyperinsulinemic Hypoglycemia: Endogenous Hyperinsulinemia Or Interference?

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Hypoglycemia is a urgent clinical condition that needs to be intervened quickly when it is detected. After rapid intervention it is necessary to carry out research to find the cause of hypoglycemia. Interference occurs when a substance or process falsely alters an assay result. We have tried to identify possible interference with the procedures we have established to make a differential diagnosis of high insulin levels ,when the our laboratory is consulted for interference.

A 62-year-old woman was admitted to the emergency room with complaints of excessive sweating and fatigue. At the time of admission other clinical signs of hypoglycemia such as nervousness and syncope were not detected. The patient who had a blood glucose of 40 mg/dL measured in the emergency department had no history of previous diagnosis of diabetes, using oral antidiabetic drug or insulin. We have been consulted in terms of patient insulin hormone interference in the endocrinology clinic for further investigation of the etiology of hypoglycemia.

Initial results of the patient; C-peptide: 14.30 ng/mL (0.9-7.1) fasting blood glucose (FBG): 46 mg/dL (74-106) insulin: 1890 uIU/mL (1.9-23). In the second measurement the C-peptide: 6.53 ng/mL (0.9-7.1) FBG: 42 mg/dL (74-106) insulin: 1442 uIU/mL (1.9-23). Since the patient was suspected of insulinoma due to the high insulin levels and the patient's clinic and radiological examinations were incompatible insulin autoantibody was sent for differential diagnosis to another laboratory and the result was found as 79 (normal: <8.2). Proinsulin was measured 33.8 pmol (N: <8.0 pmol). As a result of these findings the patient was questioned in terms of autoimmune diseases and using of the sulfhydryl group causing insulin autoantibody formation and learned that he did not use this drug group. RF and ANA were not positive. For the differential diagnosis of hyperinsulinemic hypoglycemia a prolonged fasting test was performed. The patient's blood sugar did not decrease below 60 mg/dL for 72 hours and did not have hypoglycemia symptoms. The insulin level was reduced from 299 uIU/mL to 58 uIU/mL during the test. In order to evaluate the patient for interference, serial dilution, PEG (polyethylene glycol) precipitation and HBT (heterophile antibody blocking tubes) were performed. Insulin results were as follows: Without pretreatment: 1132 uIU/mL, 1/2 dilution 548 uIU/mL, 1/4 dilution 824 uIU/mL, 1/8 dilution 1136 uIU/mL, PEG 75.3 uIU/mL, HBT: 1143 uIU/mL. Both serial dilution deterioration (linearity deterioration) and changes after treatment with PEG (%6.62 recovery) led to interference doubt and the clinician was informed. Insulin autoimmune syndrome (Hirata syndrome) should also be considered in differential diagnosis because the patient's insulin autoantibody was high and there was no previous history of insulin use.

Interferences can be caused by preanalytical and analytical processes. Although the frequency is low, the possibility of antibody induced interference in immunoassays should be considered and it should be kept in mind that erroneous outcomes may lead to false diagnosis and treatment. Laboratory specialist and clinician communication is very important in determining interference cases. This is crucial in preventing erroneous clinical practice due to incorrect test results.

Keywords : Insulin, interference, hypoglycemia

Endocrinology and Metabolism

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P-069

Abstract Reference : 172

Elevated Plasma Homocysteine Levels In Patients With Autoimmune Thyroid Disorder

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Aim: Hashimoto's thyroiditis also known as chronic lymphocytic thyroiditis is the most common cause of hypothyroidism. It is an autoimmune condition in which the antibodies attack the thyroid glands. Graves' disease which is the most common cause of hyperthyroidism is the other autoimmune disease that leads to over activity of whole thyroid glands. Homocysteine is a sulfur-containing aminoacid and formed during the methionine metabolism. Elevated plasma Homocysteine levels are associated with vascular and cardiovascular disorders. Our aim was to investigate the association between circulating homocysteine levels and autoimmune thyroid disorders thought to increase cardiovascular disorders.

MATERIALS And METHODS: A total of 200 euthyroid individuals were enrolled in this prospective study, including 50 patients with Hashimoto's Thyroiditis, 50 patients with Graves diseases, 50 individuals with non-toxic multinodular goiters (MNG) and 50 healthy controls who admitted Selçuk University Medical Faculty between 01.04.2017 and 01.10.2017. Patients with other chronic diseases and using vitamin-containing drug were excluded. Plasma Homocysteine analysis was performed with ABSciex API 3200LC/MS/MS. Statistical analyses were performed using the IBM SPSS, Version 21.

Results: Homocysteine levels were statistically higher in patients with Hashimoto Thyroiditis (mean:13.9±4.4 µmol/L) and Graves' disease (mean:13.1±4.06 µmol/L) compared to control group (mean:11.2±4.1 µmol/L) (p=0.003, p=0.02, respectively). Homocysteine levels were not statistically different between control group (mean:11.2±4.1 µmol/L) and MNG group (mean:12.4±4.2 µmol/L) (p=0.18).

Conclusion: Our results presented that plasma homocysteine levels were higher in patients with autoimmune thyroid diseases. These findings may prove an increased risk of cardiovascular diseases in autoimmune thyroiditis. The increase in homocysteine levels in both Hashimoto Thyroiditis and Graves disease may be associated with autoimmune process independent of thyroid hormone levels and course of diseases.

Keywords : Hashimoto, Multinodular Goiter, Homocysteine, Graves Disease

Endocrinology and Metabolism

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P-070

Abstract Reference : 195

Vitamin B12 Status In Patients With Thyroid Disorders

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AIM And BACKGROUND: Graves' disease is an autoimmune disease that is based on activity of whole thyroid glands and Hashimoto's thyroiditis is the other autoimmune thyroid disorder in which antibodies attack to direct thyroid glands. Autoimmune thyroid diseases are common diseases among patients.

Vitamin B12 is necessary for hematopoiesis and normal neuronal function. In humans, it is obtained only from animal proteins. We aimed in this study to compare the level of vitamin B12 between thyroiditis disorders and healthy control groups.

Materials And Methods: Plasma samples were collected from 40 healthy control, 50 individuals with Hashimoto' thyroiditis, 50 patients with Multinodular goiter (MNG) and 50 patients with Graves' thyroiditis who apply to the Selçuk University Hospital between in 01.04.2017-01.10.2017, prospectively. Age, BMI and gender distribution were similar among groups. Patients with other chronic diseases, inflammatory disorders and patients using Vitamin B12 consisting drug were excluded. Only euthyroid individuals were included in this study. Vitamin B12 levels were measured on the Roche Cobas e170 using the ECLIA method. Analysis was performed with IBM SPSS v21.

Results: Vitamin B12 levels were statistically lower in patients with Graves' thyroiditis compared to control group [327.8 ± 130.3 ng/L and 398.6 ± 185.8 ng/L] ($p=0.03$). There were no statistically differences among Hashimoto' thyroiditis, MNG and control group.

Conclusions: Our results showed that Vitamin B12 levels are lower in Graves' disease compared to control group. These findings can cause hyperhomocysteinemia that may lead increased cardiovascular risk in patients with Graves' disease. Further studies are needed.

Keywords : Graves' diseases, Vitamin B12, hyperthyroidism, Hashimoto' thyroiditis

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Venipuncture For Thyroid Stimulating Hormone Testing In Primary Hypothyroidism Should Be Done In The Morning

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A female patient (44 years old) with primary hypothyroidism on medication with Levothyroxine applied to two different physicians on the same day. Both clinicians requested a Thyroid Stimulating Hormone (TSH) test. The first venipuncture was performed at 9:30 (am) and the second one at 11:50 (am). TSH results were 9,54 mIU/L and 4,52 mIU/L respectively. TSH was analyzed on the Roche Cobas 6000 platform with an intermediate CV of about 2 %. The mix up of specimens was excluded due to additional tests performed on both samples. At 5 pm an extra venipuncture from the same patient was performed with a TSH result of 3,85 mIU/L. These findings are in accordance with published studies (1,2) with higher TSH levels in the morning compared to the levels after that throughout the day.

TSH is an example of an analyte with important circadian variation with higher morning levels and lower afternoon levels. As seen in this case a TSH morning level can be 100 % more than an afternoon level. This variation is much more than random biological variation (19,3 %) (3). Analytical variation is much less (about 2%) which can be neglected considering the circadian or biological variation.

According to this case and other studies performed, samples for TSH should be taken before 10 am to estimate the thyroid function and efficiency of hypothyroidism medication properly.

Keywords : Circadian variation, TSH, Primary Hypothyroidism

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P-072

Abstract Reference : 213

Biological Markers In Professional Burnout

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Background: Burnout is a stress state characterized by symptoms of emotional exhaustion, depersonalization, and a decreased sense of personal accomplishment caused by work-related stress (1). Physicians are at increased risk for burnout as a result of 24 work hours, , layed gratification challenges with work and home balance, and challenges associated with patient care. Several biomarkers have been tested for association with burnout, but the results are conflicting.

Aim: In a recent study, we investigated the interest of exploring biological parameters among doctors with different specialties, operating under emergency conditions.

Methods: Ninety-five doctors were compared to 95 controls participants working outside the medicine. We analyzed cortisol in saliva and saliva, serum prolactin, fasting glucose, glycosylated hemoglobin (HbA_{1c}) in relation to burnout symptoms. To evaluated the level of Burnout all participations received a questionnaire containing 22-item Maslach Burnout Inventory.

Results and discussion: The level of Burnout in three subscales of emontional exhaustion, depersonalization and perceived low personal accomplishment was moderate in 85% of doctors. Participations with burnout presented higher levels of cortisol and HbA_{1c}. Significant positive correlation existed between serum and saliva cortisol levels, HbA_{1c} and the two dimensions (emotional exhaustion and depersonalization ($\rho=0.83, 0.85, 0.79, p<0.01$)) of burnout. We found strong positive correlation between serum levels of cortisol and saliva cortisol in both groups ($\rho=0.904, 0.932$). Our finding demonstrated the interest of biomarkers of stress, in particular cortisol levels and HbA_{1c} in the characterization of professional burnout. This study emphasize the place of measurement of saliva cortisol as a simple noninvasive test to help identify abnormalities in the hypothalamic pituitary adrenal (HPA) in order to prone negative aspects of professional stress.

Keywords : stress, professional burnout, biomarkers

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P-073

Abstract Reference : 249

Ischemia Modified Albumin Levels in Proliferative and Non-Proliferative Diabetic Retinopathy

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Purpose: Ischemia-modified albumin (IMA) is a novel marker of tissue ischemia and has been recently considered as a marker of oxidative damage in diabetes. It is reported that oxidative stress has an important role in the pathophysiology of diabetic retinopathy (DRP). In this study, our aim was to determine the levels of IMA in patients with the proliferative (PDRP) and non-proliferative diabetic retinopathy (NPDRP).

Methods: IMA levels were measured in patients which were diagnosed as PDRP (n=39) and NPDRP (n=41) patients and in healthy controls (n=31). An albumin-cobalt binding test was used to define serum IMA in absorbance units (ABSU). Serum albumin levels were measured to adjust IMA levels and albumin adjusted IMA (AAIMA) levels were calculated with the following formula: $AAIMA = IMA \times (\text{albumin} / \text{median albumin})$ to eliminate the effect of albumin levels to IMA .

Results: Mean serum IMA levels were 0.533 ± 0.092 ABSU in the PDRP group, 0.505 ± 0.092 ABSU in the NPDRP group and 0.450 ± 0.060 ABSU in the control group. The differences in IMA and AAIMA levels were statistically significant for diabetic retinopathy patients (group 1 and group 2) and control group ($p < 0.05$). Although PDRP group IMA and AAIMA mean levels were higher than NPDRP group, there were no statistically significant difference between them ($p > 0.05$).

Conclusion: Serum IMA levels were higher in the diabetic retinopathy patients compared with the control group. We conclude that IMA may reflect the existence of retinal vascular complications and may be a useful marker in monitoring the risk of DRP development in diabetic patients.

Keywords : ischemia-modified albumin, diabetic retinopathy, oxidative stress

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P-074

Abstract Reference : 375

SERUM LIPASIN LEVELS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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Aim: Angiopoietin-like protein 8 (ANGPTL8), also called refeeding-induced fat and liver (RIFL), lipasin, betatrophin, and chromosome 19 open reading frame 80 (C19orf80), is a novel protein that is primarily expressed in the liver and fat. Subsequent publications showed that ANGPTL8 was involved in β - cell proliferation in response to treatment with insulin receptor antagonist. The aim of this study was to investigate serum lipasin levels in patients with type 2 diabetes mellitus.

Materials and Methods: 41 healthy controls; 33 prediabetic, 40 well-controlled and 43 uncontrolled patients with type 2 diabetes mellitus were enrolled to the study. Serum lipasin levels were analyzed with Cusabio ELISA commercial kit. Briefly, standards and samples are pipetted into the wells and any ANGPTL8 present is bound by the immobilized antibody. After removing any unbound substances, a biotin-conjugated antibody specific for ANGPTL8 is added to the wells. After washing, avidin conjugated Horseradish Peroxidase (HRP) is added to the wells. Following a wash to remove any unbound avidin-enzyme reagent, a substrate solution is added to the wells and color develops in proportion to the amount of ANGPTL8 bound in the initial step. The color development is stopped and the intensity of the color is measured.

Results: Serum lipasin levels were significantly higher in control group 4214(1072-6206) compared to prediabetic 3712(509-5403), well-controlled 2708,8(645,4-5682) and uncontrolled diabetic groups 2213(688,4-7490,8) ($p < 0.001$ for all groups compared to control).

Conclusion: Circulating levels of betatrophin could be a potential biomarker for predicting new-onset diabetes. Further studies are needed to understand the underlying mechanism of this association. Serum lipasin levels might be a promising biomarker for occurrence of diabetes mellitus.

Keywords : Lipasin, Diabetes Mellitus, Biomarker

Evidence Of Vitamin D Deficiency And Insufficiency Among Syrian Refugee Children In Turkey; Data Deduced From A University Hospital's Central Laboratory

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Over the last few decades, vitamin D status has been extensively evaluated in different populations worldwide, including various ethnic and age groups (1). Previous studies showed deficiency of vitamin D in refugee children population in Canada and Australia (2, 3). Vitamin D deficiency in children has been linked to adverse effects such as growth failure and rickets. Adequate levels of vitamin D may also help reduce risk of autoimmune conditions, infection and type 2 diabetes (4). The aim of this study was to evaluate the vitamin D levels and assess seasonal variations of vitamin D status of Syrian refugee children in Turkey.

This study was performed by using pre-recorded electronic files and laboratory results of Syrian refugee children admitted to Balcalı Hospital of the Cukurova University in 2017. Our hospital is a tertiary hospital located close to border of Syria. Results of plasma 25-hydroxy-vitamin-D (25OHvitD) levels of 106 children aged 0-16 years (47 girls, 59 boys) residing in Cukurova region were included to the study. The study group divided into two groups whom admitted to our hospital in summer and winter periods. Plasma 25OHvitD levels were analysed with HPLC method.

Vitamin D deficiency (≤ 20 ng/ml) was found in 47.2 % of children and vitamin D insufficiency (21-29ng/ml) was found in 17.9 % of children. The mean plasma levels of 25OHvitD was statistically significantly higher in summer period (Mean \pm SD: 32.5 ± 46.04 nmol/L) than in winter period (Mean \pm SD: 24.36 ± 15.49 nmol/L) ($p=0.004$).

The majority of Syrian refugee children show vitamin D deficiency and insufficiency that may cause from dietary insufficiency, malabsorption and prolonged breastfeeding without supplementation during undesirable migrant situation. Additionally low vitamin D levels of mothers during pregnancy may be another reason. These data show us the need to implement effective prevention and intervention strategies in the management of vitamin D deficiency among Syrian refugee children, with the supplementation throughout the entire year.

Keywords : Vitamin D, Seasonal variation, Syrian refugee children

Genetic And Environmental Determinants For Vitamin D Deficiency In A Healthy Tunisian Population

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Aim: Vitamin D deficiency has been recognized as a major public health issue worldwide. Recent studies have indicated that genetic factors might play an important role in determining serum 25-hydroxyvitamin D [25(OH) D] levels in low latitude countries such as Tunisia.

Our objective was to determine the genotypic frequency of 6 single-nucleotide polymorphism that affect 4 key genes within the vitamin D metabolic pathway (DBP gene, VDR gene, CYP2R1 and CYP27B1) and to identify their relationship with the levels of 25(OH) D after adjustment for non-genetic potential confounding factors.

Materials and methods: 154 unrelated healthy Tunisian subjects were recruited from CHU sahloul occupational medicine department. According circulating vitamin D level, we divided them into vitamin D deficient (severe hypovitaminosis D) (lower than 10 mg/mL); vitamin D insufficient (hypovitaminosis D) (between 10 to 30 mg/mL) and optimal vitamin D status (D above 30 mg/mL). Genotyping of the 6 Snp (DBP gene: rs7041; VDR gene: rs2228570, rs1544410, rs731236, rs7975232; CYP2R1: rs10741657; and CYP27B1: rs10877012) was performed by PCR-RFLP. We evaluate for each subject age, gender, BMI, skin pigmentation, season, sun/ duration of exposure, use of sun screen, regular intake of vitamin D (using food frequency questionnaire). Allelic combinations and statistical analysis were realized using SNP Analyzer2.0 and SPSS20, respectively.

Results: Within the studied group 3,2% had optimal vitamin D levels while the accumulated prevalence of hypovitaminosis D was 96,8% (70.1% Vitamin D insufficient and 26,6% Vitamin D deficient). hypovitaminosis D was highly prevalent in women (P=0.001). In fact, vitamin D levels were significantly lower in women (11, 70 [0,00-65,70] vs 18,55 [7,40-36,50], p<0.001). We also noted that recruitment season, veil wearing and use of sun screen seemed to be associated with hypovitaminosis D (P<0.05). Genotype frequencies were in Hardy-Weinberg equilibrium. According dominant model and after adjustment for potential confounding factors, hypovitaminosis D seems to be significantly associated with mutated alleles CYP2R1-rs10741657 (OR=2,43 [1,09-15,12] p=0,046) and CYP27B1-10877012 (OR=1,35 [1,02-,0,3] p=0,049). The association with VDR-rs731236 was not significant (OR=2,63 [0,42-16,28] p=0,26). A synergic effect between these SNP was observed, in fact participants carrying simultaneously the three risk alleles (VDR-rs731236 G, CYP27B1-rs10877012 T and CYP2R1-rs10766197 G) had significantly lower 25(OH) D concentration compared with those lacking the risk alleles p<0,05 in fact 60% was insufficient and 40% was deficient .

Conclusions: our research suggests that the DBP, CYP2R1 and genes may be important in regulating serum 25(OH)D levels in healthy Tunisians. Supplementation by vitamin D and a more outdoor lifestyle, especially for women, should be seriously considered as a way to reduce this deficiency. A limitation of the present study is that the sample size is relatively small. Further well-designed investigations with larger sample sizes are warranted to confirm our findings.

Keywords : Vitamin D, Polymorphisms, VDR, CYP2R1, DBP, CYP27B1

Determination Of Antioxidant Properties Of Some Herbal Teas Used In Daily Life And Effect Of Microwave, Heating, UV-Light On Antioxidant Properties Of Infused Herbal Teas

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Aim: The aim of this study¹³ is to investigate whether the total antioxidant activity (TAS) of infused herbal teas of leaves of *Salvia Fruticosa* Miller (Anatolian sage), *Hibiscus Sabdariffa* (Roselle-Kerkede) and *Sideritis Congesta* (Mountain tea-Highland tea-Spike tea) were affected by different physical factors applied after infusion and during infusion.

Material and Methods: 0.1 g of each of dry leaves of *Salvia Fruticosa* Miller, *Hibiscus Sabdariffa* and *Sideritis Congesta* purchased from the plant store was weighed and was brewed in 10 ml of water (25°C, 50°C, 75°C and 100°C) and three different time series (10, 30 and 60 minutes). In addition, infused tea solutions were subjected to 3 different power microwave applications (300W, 450W and 600W) in 2 different time series (1 minute and 2 minutes) and ultraviolet light application(30 Watt) in 3 different time series (10 minutes, 30 minutes and 60 minutes). The total antioxidant status (mmol Trolox Equiv./L)of infused teas was measured on the basis of converting the dark blue-green colored 2,2'-azino-bis (3-ethylbenzothiazoline-6-sulphonic acid) radical cation (ABTS * +) of antioxidants to the colorless reduced ABTS form.

Results: In the comparison of the TAS levels in the temperature and time categories, it was determined that the time dependent TAS levels were increased in all the temperature categories of the 3 types of tea samples. Maximum antioxidant activities were obtained when *Salvia Fruticosa* Miller at 75°C for 60 minutes, *Hibiscus Sabdariffa* at 25°C for 60 minutes and *Sideritis Congesta* at 100°C for 60 minutes were brewed. The highest antioxidant activity was found in infusion of *Sideritis Congesta* among three plants were brewed at 100 °C for 10 minutes. In comparisons for TAS levels in microwave power and time categories, it was determined that the time-dependent TAS levels were increased in all microwave power categories of the 3 types of tea samples. The highest values for the TAS levels were found at 600 Watt for all types of tea samples. It was determined that the time-dependent TAS levels were increased in UV applications of 3 types of tea samples. The highest values for TAS levels were determined after 60 minutes of 30 Watt UV application to *Sideritis Congesta* samples.

Conclusion: TAS levels tend to increase as temperature and duration of infusion, microwave power and duration, and duration of UV application increase for all three types of herbal tea except *Hibiscus Sabdariffa*. *Hibiscus Sabdariffa* should be brewed at 25°C for 60 minutes to obtain maximum antioxidant activity. It has been found that different physical conditions in the brewing order have important effects on herbal tea's antioxidant activity.

Keywords : brewing time; hibiscus sabdariffa; microwave; salvia fruticosa miller; sideritis congesta; temperature; total antioxidant status; ultraviyoleet light

Gastroenterology

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P-078

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Impact of DAAs on Leucocytic DNA Telomere Length in HCV Related Hepatic Cirrhosis.

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Background: New direct acting antiviral (DAAs) have established an advancement in management of Hepatitis C virus (HCV) related hepatic cirrhosis. High percentage of patients have a sustained virologic response (SVR), eradication of HCV is coupled with decreased risk of hepatocellular carcinoma. Recent evidence suggested that shortening of DNA telomere may be linked to cellular senescence as well as predisposition to malignant transformation.

Study Objective was to assess leucocytic DNA telomere length in HCV- related cirrhosis pre-treatment with DAAs and following viral eradication, and healthy controls to accurately evaluate molecular changes in response to treatment.

Methods: The study included 24 patients with HCV related cirrhosis, Child –Pugh A, after exclusion of Hepatitis B viral infection. Plasma samples obtained for determining HCV RNA, HCV genotype. Whole blood samples obtained from patients' pre-treatment and 12 weeks after end of treatment (EOT), as well as from 24 healthy controls. Terminal restriction fragment, corresponding to telomere length, was measured by a non-radioactive Southern blot technique, detected by chemiluminescence.

Results: All patients were HCV genotype 4. DNA telomere length was significantly shorter in all patients prior to treatment (TRF 6.29±0.40kb) compared to results 12 weeks EOT (TRF 7.78±0.46kb) and healthy controls (TRF 7.87±0.50kb).

Conclusion: The telomere length convalesced after SVR, proposing that telomere shortening may promote development of hepatic cirrhosis and can be counted as marker of recovery.

Keywords: Hepatitis C; direct acting antiviral drugs; hepatic cirrhosis; DNA telomere

Gastroenterology

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P-079

Abstract Reference : 393

Is There Benefit Of HCV Ag Testing?

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Aim: HCV Ag test as a diagnostic marker and part of the algorithm for the confirmation of anti-HCV reactivity is introduced for patients at risk, haemodialysis patients, organ donors, occupational exposures to blood and body fluids, on request and for anti-HCV reactive samples. The purpose of the study is to evaluate up-to-date patient testing for HCV Ag and its benefit.

Materials and Methods: From 2009 to 2017 overall 60.953 patient samples, including first time tested and follow-up patients, were tested for the Abbott Architect HCV Ag test and Architect Anti-HCV. Samples with HCV Ag concentration values ≥ 0.06 to 0.2 pg/mL were retested in duplicate. Follow-up testing included serology and/or HCV RNA by COBAS AmpliPrep/TaqMan HCV quantitative test, v. 2.0.

Results: Out of 60.953 samples tested for HCV Ag 59.889 (98.3%) were negative and 1.064/60.953 (1.8%) positive. 1.005/1.064 (94.5%) were anti-HCV reactive and 59/1.064 (5.5%) negative, respectively. 35/59 (59.3%) are considered as false positive due to the following negative HCV testing, and/or HCV RNA. HCV Ag concentration values in those 35 patients were from 0.06 to 4 pg/mL. 4/59 were window-period infections (seroconversions): in 2 haemodialysis patients, 1 bone marrow transplant and 1 unknown. For 20/59 patients are no data.

Conclusion: The results of this study indicate that there is benefit of HCV Ag testing especially for rapid confirmation of an active hepatitis C infection (anti-HCV and Ag reactive, with no need for anti-HCV immunoblot confirmation) or for the detection of an early hepatitis C, where anti-HCV is still negative.

Keywords : HCV Ag, anti-HCV confirmation

Gastroenterology

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P-080

Abstract Reference : 373

Protective Effects Of N-Acetylcysteine And Taurine Against Acetaldehyde-Induced Oxidative Stress In Liver And Brain Tissues Of Rats

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Aim: Acetaldehyde (AA) is the metabolite in alcohol metabolism. Exposure to AA can occur through ingestion of several dietary products, inhalation of cigarette smoke/automobile exhausts, or contact with cosmetics. AA accumulation causes oxidative stress. The aim of this study was to investigate the prooxidant/antioxidant status in rats chronically exposed to AA, and to evaluate the effects of N-acetyl cysteine (NAC) and taurine (TAU) on prooxidant/antioxidant balance.

Materials and Methods: Thirty two Sprague Dawley rats were divided in the following groups (n=8; each): Control, AA, AA+NAC, AA+TAU. Reactive oxygen species (ROS), protein carbonyl (PC), malondialdehyde (MDA), diene conjugate (DC), ferric reducing antioxidant power (FRAP), glutathione (GSH), superoxide dismutase (SOD) and glutathione peroxidase (GSH-Px) in liver and brain tissues were determined.

Results: ROS formation increased in liver and brain tissues of AA-administered rats. Liver MDA and brain PC were also elevated. NAC decreased hepatic ROS and PC, and increased GSH levels. Brain ROS, PC and MDA levels were decreased due to NAC treatment. TAU showed similar effects in liver and brain, and additionally decreased the elevated GSH-Px activity in brain.

Conclusion: Chronic AA administration has created a prooxidant condition, and NAC/TAU appears to be useful in suppression of the developed oxidative stress.

Keywords : Acetaldehyde, N-acetylcysteine, taurine; oxidative stress; antioxidant system

Gastroenterology

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P-081

Abstract Reference : 285

The Four-Year Rate of Clostridium difficile Toxin A and B in Stool Samples of Patients with Diarrhoea at a University Hospital in Konya

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Clostridium difficile is the leading cause of antibiotic-associated diarrhoea and colitis. Common risk factors for *C. difficile* infection are a long duration of hospitalization and an exposure to the certain antimicrobial agents. Antibiotics commonly used in healthcare facilities may disrupt gut microflora inducing susceptibility to *C. difficile* infection, and finally leading to the destruction of the intestinal mucosal cells, mediated by its cytotoxic enzymes toxin A and toxin B. Recently, the tendency towards extensive antibiotic usage has brought an increase in the rate of *C. difficile* infections worldwide. The diagnosis of infections caused by *C. difficile* is mainly based on the clinical signs and symptoms with a history of antimicrobial use and on the laboratory tests. The most widely used laboratory diagnostic test for *C. difficile* is the enzyme immunoassay for toxins A and B. The aim of the present study is to investigate the rate of *C. difficile* toxin A/B at Meram Faculty Hospital.

The stool specimens of patients with diarrhoea, who were hospitalized at various clinics were investigated for *C. difficile* toxin A/B by using an immune-chromatographic assay (CerTest Biotech, Spain) between 01.01.2014 and 31.01.2017. Of 1502 stool specimens, 94 (6,3%) were positive for *C. difficile* toxin A/B.

In conclusion, the rate of *C. difficile* toxin A and B was found to be not high in the hospitalized patients at Meram Faculty Hospital. On the other hand, the test results should be interpreted with caution taking the clinical signs and symptoms and the risk factors into the consideration.

Keywords : Clostridium difficile, toxin A and B, diarrhoea

Hematology – Oncology

Status : Accepted - Poster Presentation

P-082

Abstract Reference : 37

Cytological Diagnosis Of Intraoperative Washings In Patients With Gastric Cancer.

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Aim: improvement of cytological diagnostics of peritoneal lavage with the use of immunomorphological methods for detection of free tumour cells of stomach cancer.

Materials and Methods: the analysis of 260 surgical materials in patients with stomach cancer treated in the department of high-tech surgery from June 2016 to March 2018 was performed. The average age of the patients was 64 years (32 to 86 years), of them 130 women and 130 men.

Peritoneal lavages are obtained with diagnostic laparoscopy. Cytological preparations were made by a liquid technique on Cyto-Tek cytocentrifuge. As a control of the availability of the necessary number of tumour cells were used drugs, stained using the method of Pappenheim. The immunocytochemical study was performed with Roshe monoclonal antibodies. The following monoclonal antibody markers panel was chosen: Ber-EP4, CEA, CK7, CK20. Immunocytochemical studies were performed on cytological preparations or material prepared by the cell block method.

Results: in 185 cases, a traditional cytological study was performed. As a result of this study, free tumour cells (FTC) were found in 80 patients (in affirmative or presumptive form), accounting for 43% of cases. In 104 (56.4%) of patients, no tumour cells in peritoneal washout were found, one material (0.6%) was not informative, due to pronounced degeneration of cellular elements.

The sensitivity and specificity of this study were 52% and 81% respectively, the overall accuracy of the method was 67%, this value was comparable to the general accuracy of macroscopic examination, according to diagnostic laparoscopy (63%). Positive (PPV) and negative (PVN) prognostic significance of the test was 69% and 67%, respectively.

As a result of 75 combined studies (traditional light microscopic examination and immuno-cytochemical study), 18 (24%) positive on FTC patients and 57 (76%) negative cases (CY-) were revealed. With the combined use of all the above methods of preparation and assessment of the material, the specificity of cytological diagnosis was 100%, and the sensitivity was 95%, the overall accuracy of the method reached 99%. The positive predictive value of the test (PPV) reached 100%, negative (PVN) 98%.

Conclusions: Immunocytochemical study with use of a combination of monoclonal antibody-markers (Ber-EP4, CEA, CK20) on cytological preparations or cell blocks, increased the sensitivity and specificity of cytological diagnosis by 43% and 20%, respectively, and the overall accuracy of the method by 32%, which allowed to more accurately establish the stage of the tumour process and solve the issue of patient's monitoring tactics.

The use of light microscopy alone to detect free tumour cells in peritoneal lavage is not sufficient, as the cellular elements are subject to significant changes, single cancer cells are difficult to differentiate among mesothelioma, histoid, macrophage and other background elements.

Keywords : Immunomorphological markers, cytological exam, free cancer cells, gastric cancer.

Gastroenterology

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P-083

Abstract Reference : 325

Initial Study Of Follow-Up Positive Samples For The Breath Test

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Introduction: *Helicobacter pylori* infection affects approximately 50% of the Spanish population. *H. pylori* is a positive urease gram-negative bacillus that infects human gastric epithelium. *H. pylori* infection can produce inflammation of the gastric mucosa progressing to the development of gastritis, peptic ulcer or mucosal-associated lymphoid tissue lymphoma (MALT). The screening test used in the clinical laboratory for the detection of *H. pylori* is the breath test. This test determines the presence of carbon 13 which appears in the exhaled air after ingesting a solution with marked urea that is metabolized by the microorganism. The first line of treatment is a quadruple therapy mix of three antibiotics (amoxicillin, clarithromizine, and nitroimidazole) and a proton pump inhibitor (10-14 days of treatment). Between 10 and 15% of patients who receive eradicating treatment do not respond. The objective of the therapy is to achieve healing in a percentage close to or greater than 90%.

Objective: Study of the number of patients to whom the breath test is repeated, after the identification of a positive sample during the year 2017.

Material And Methods: The breath test consists of taking two samples of exhaled air on an empty stomach for each patient, each of them collected in two separate specific bags. The first is obtained in basal state while the second one is collected 20 minutes after the first one after having ingested a urea tablet marked with carbon 13. The urease activity releases the carbon 13 excreted by the breath, which is quantified with a POCone® spectrophotometer (Ferrer). If the increase of carbon 13 between both samples is equal to or greater than 2 per thousand (‰), the positive result is considered and therefore the infection is present in the patient. The data used for this study came from primary care patients, and were obtained from the laboratory computer system using the Onmium® program (Roche, Switzerland). An Excel® sheet (Microsoft) was used to analyze the data.

Results: During the study period, 3417 positive samples were detected, representing 51.17% of the total samples studied. Of the total positive patients, a second determination was made to 1405 patients (41.12%). On the other hand, 2012 positive patients have not been repeated this determination (58.88%).

Conclusions: In our population, a high percentage of patients has been identified who do not repeat this test after a positive test for *H. pylori* infection. The repetition of the breath test is the best tool to assess the elimination or effectiveness of treatment of the infection after antibiotic treatment. It is of interest to determine the causes why these patients are not being monitored again to assess the degree of infection.

Keywords : H. pilory, breath test, repetition samples

Gastroenterology

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P-084

Abstract Reference : 328

Evaluation Of The Impact On The Reduction Of The Cutting Point In A Colorectal Cancer Screening Program: Pilot Study

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Introduction: Colorectal cancer is a disease whose incidence rate has increased significantly in the last decade, associated with high mortality. It represents the second cause of cancer incidence and mortality, in both men and women in most of the developed countries, and the first place considering both sexes together. The screening test, based on the detection of occult blood in feces, is aimed at people without symptoms of an age range between 50 and 69 years in our Autonomous Community. The established cut-off point to consider a sample as positive has been established at 100 ng/mL. The reduction of this target value may contribute to the increase in the rate of detected colorectal cancer cases.

Objective: Evaluation of the number of positive samples that would be detected as a consequence of the reduction of the cut-off point in the fecal occult blood test.

Material And Methods: Stool samples from primary care centers are received in the laboratory in a kit for taking the specific sample. The package contains a probe that the patient must click on the stool sample collected in 5 or 6 different points. Subsequently, the probe should be introduced into the container, closed and the tube shaken to homogenize the sample. The antigen-antibody reaction with the anti-hemoglobin monoclonal antibodies by latex agglutination is determined by immunoturbidimetry. The containers are arranged in specific racks of OC-sensor IO® equipment (Diagnostic Biogen), which also employs reaction (for agglutination) and latex reagent cuvettes. The results are expressed in ng / mL, considering the cut-off point values higher than 100 ng / mL as a positive result. This cut-off point was compared with two cut-off points, one between 50-100 ng / mL and the other between 75-100 ng/mL. The data were obtained from the laboratory computer system using the Onmium® program (Roche, Switzerland). An Excel® sheet (Microsoft) was used to analyze the data.

Results: During the year 2017 there were 9539 tests of occult blood in faeces in our laboratory, of which 1126 (11.8%) were positive versus 8413 (88.2%) that were negative. The reduction of the cut-off point to 75 ng / mL would mean an increase of 109 positive samples, representing 12.94% of the total samples. On the other hand, reducing the cut-off point to 50 ng / mL would increase the number of positive samples by 340 (15.36% of the total samples).

Conclusions: The reduction of the cut-off point for the detection of positive samples for the fecal occult blood test at 75 ng/mL slightly increases the percentage of positive samples, being of interest to consider the samples contained in this interval, and thus be able to rule out a possible origin related to a neoplastic process. It would be interesting to know the impact that this increase of positive samples would have on the assistance services, and on the screening program

Keywords : Screening, colorectal cancer, cut-off, point, reduction

Gastroenterology

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P-085

Abstract Reference : 376

Early Prediction Of Crohn's Disease Activity By Biomarkers In Clinically Remission Patients

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Aim: Crohn's disease (CD) is an immunity-based inflammatory disease of unknown etiology that can affect any region of the gastrointestinal tract with transmural involvement. In these patients; many clinical activity indicators and noninvasive markers have been used to assess disease activity, but none have been as accurate as histopathological and endoscopic examinations in detecting inflammatory activity. In CD, disease activity is clinically determined by the patient's Crohn's Disease Activity Index (CDAI) score. According to CDAI, less than 150 points is accepted as remission, and over 450 points is a serious fulminant disease. The aim of this study is to predict the disease activity by biomarkers such as fecal calprotectin and lactoferrin in clinically remission Crohn's disease patients.

Materials And Methods: Twelve asymptomatic patients with Crohn's disease (CDAI <150) were included in our study, and CDAI score was calculated on the day of out patient polyclinics admission. C reactive protein (CRP), serum amyloid A (SAA), erythrocyte sedimentation rate, and complete blood count were measured in blood samples, and fecal calprotectin, lactoferrin in the gut samples. According to colonoscopy reports (performed within one week), 5 patients were in remission and 7 were active CD.

Results: In active CD patients, fecal calprotectin, lactoferrin, serum CRP and SAA (p <0.050 for all) were higher than patients in remission.

Conclusion: Fecal calprotectin and lactoferrin which reflect mucosal inflammation should be performed before colonoscopy in order to determine the candidates to this invasive process. Comprehensive studies in larger groups of CH in the light of the relevant literature will increase the power of these biomarkers in disease activity follow-up

Keywords : Crohn's disease, calprotectin, lactoferrin

Hematology – Oncology

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P-086

Abstract Reference : 19

Cell Adhesion Serum Markers In Early Stage Breast Cancer

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Aim: Fetuin-A is known to increase metastases over signals and peroxisomes related with growing. Receptor activator of nuclear factor- κ B ligand (RANKL) takes part in cell adhesion, and RANKL inhibition is used in the management of cancer. We aimed to examine the relation between serum fetuin-A, RANKL levels, other laboratory parameters and clinical findings in women diagnosed breast cancer, in our population.

Materials and Methods: Women having early stage breast cancer (N=117) met our study inclusion criteria as they had no any anti-cancer therapy before. Thirty-seven women (with benign neoplasm) or healthy individuals followed up in the out-patient clinics and confirmed sonographically made up our controls. Routine laboratory results and clinical data were achieved from the patient records. Serum samples were stored at -80°C and analysed via ELISA ().

Results: Patients were 56% postmenoposal, 40% premenoposal and 4% perimenoposal. Patients had lower high-density lipoprotein levels (p=0.002) and higher neutrophyl counts (p=0.014). Fetuin-A and RANKL levels did not differ between the groups (p=0.116 and p=0.439, respectively).

Conclusion: In this study, we found no relation between serum fetuin-A, RANKL levels and clinical findings in patients diagnosed early stage mammary cancer. The two parameters of fetuin-A and RANKL seemed lower in subgroups with preferable profiles of histopathologic findings although there was no significant difference.

Keywords : breast cancer, fetuin-A, metastases, receptor activator of nuclear factor- κ B ligand

Hematology – Oncology

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P-087

Abstract Reference : 63

Lymphoproliferative Diseases: An Increase In Regulatory Suppressor T-Cells In The Peripheral Blood And Bone Marrow

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Introduction: The mechanisms of immune suppression in lymphoproliferative diseases should receive a high priority. Their understanding will offer deeper insights into the development of disease.

Purpose: The purpose of our study was to measure the levels of regulatory suppressor T-cells (Tregs) in the peripheral blood (PB) and bone marrow (BM) of patients with previously untreated B-cell chronic lymphocytic leukemia (B-CLL) and non-Hodgkin lymphoma (B-NHL) including the localized or leukemic process.

Materials and methods: Initial counts of suppressor Tregs were determined in PB of 29 patients with localized disease and in 53 patients with leukemia as well as in BM of 28 and 24 patients, respectively. Treg populations were defined by the phenotype of CD45⁺CD4⁺CD25⁺CD127^{low/-} cells (FACS Canto II, BD Biosciences). The control group consisted of 40 practically healthy people. The Student's t-test and Mann-Whitney U test were used to compare the mean values between two groups in the program STATISTICA 8.0.

Results: Blood. In localized disease, when aberrant lymphocytes were concentrated in the lesion focus, the percentage of Tregs in PB was 6.39% (norm=3.69%). In leukemia patients, in whom the relative number of clonal B-lymphocytes in PB was high and made up on average 65%, the percentage of Tregs was significantly higher and made up 8.27%. In localized disease, the absolute number of Tregs was close to the normal value (0.053*10⁹ cells/L vs. 0.031*10⁹ cells/L), whereas in leukemia, their number was almost one order of magnitude higher than the normal value (0.192*10⁹ cells/L, p <0.05).

Bone marrow. In localized disease, the percentage of Tregs in BM was 1.4 times higher than that in PB and made up 8.76% and 6.39%, respectively; but their absolute number in BM was higher than that in PB by a factor 4 (0.220*10⁹ cells/L vs. 0.053*10⁹ cells/L). In leukemic involvement of BM, the average percentage of Tregs was 12.08% (in PB – 8.27%); and their absolute number in PB was 2.2 times higher (0.430*10⁹ cells/L and 0.192*10⁹ cells/L). Thus, in widespread disease, the relative and absolute numbers of Tregs were higher than those in localized lymphoproliferative disease. The number of suppressor Tregs in BM was higher than in PB.

Conclusion: The levels of Tregs in PB and BM of previously untreated patients with localized and leukemic lymphoproliferative processes were compared. In localized disease, the relative and to a lesser degree absolute numbers of T regulators in PB exceeded the control values. In the leukemic process, both the percentage and the number of Tregs in PB significantly exceeded the normal level. In localized and especially in widespread disease, the number of Tregs in BM was significantly higher than in PB. In localized disease, a higher number of Tregs in BM than that in PB is supposed to reflect their functions to suppress the activity of autoreactive T cells and other cell types that are formed during hematopoiesis and immunogenesis. In widespread disease, tumor cells can perhaps use BM as a favorable niche owing to the origin and tropism. In this case, they have the best conditions to survive because of the decreased control of the bone marrow area by effector T lymphocytes and NK-cells. A fairly large increase in the number of Tregs may result from a usual migration of tumor cells from PB, organs and tissues to BM and creating favorable conditions for conversion of activated T-helper cells into Tregs.

Keywords : regulatory suppressor T-cells (Tregs), lymphoproliferative diseases, peripheral blood, bone marrow

Hematology – Oncology

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P-088

Abstract Reference : 418

Validation of a 6-part differential hematology analyzer Siemens Advia 2120i

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Aim: The aim of this study was to perform the validation of a 6-part differential hematology analyzer Siemens Advia 2120i (Erlangen, Germany), prior to its routine implementation.

Materials and methods: Our validation protocol combined the CLSI H26-A2: 2010 and the ICHS 2014 guidelines, and included: precision (within and between run), accuracy (comparison with reference analyzer – 300 samples), linearity, carryover, confirmation of a LoB, determination of a LoD and LoQ. TE% was calculated for all measured parameters. Acceptance criteria were based on: manufacturer technical specifications (Siemens), 2016 state-of-the-art criteria (Vis and Huisman) and biological variation. Analysis was done using MedCalc 16.2.0 statistical software (MedCalc Software bvba, Ostend, Belgium).

Results: The lowest within and between run precision CVs were observed for MCV (0.3% and 0.6%, respectively). Bland&Altman plot did not reveal statistically significant bias for any of the measured parameters: WBC (difference (%):-1.0, 95%CI:-10.2 to 8.1), RBC (difference (%):-1.4, 95%CI:-4.3 to 1.5), Hb (difference (%):-0.2, 95%CI:-2.5 to 2.1) and Plt (difference (%):-6.9, 95%CI:-2.4 to 16.1). Linearity was confirmed for all tested parameters ($r > 0.99$). The carryover estimates ranged from 0.1% for Plt to 0.8% for WBC and were within the manufacturers specifications ($\leq 1\%$). Manufacturers claims for LoB were confirmed. The estimated LoD and LoQ were $0.05 \times 10^9/L$ and $0.1 \times 10^9/L$ for WBC, while for Plt values were $2 \times 10^9/L$ and $3 \times 10^9/L$, respectively. The calculated TE% ranged from 2.35% for Hb to 12.33 for Plt.

Conclusion: Hematology analyzer Siemens Advia 2120i is completely in accordance with the predefined quality goals and is suitable for everyday routine practice.

Keywords : hematology analyzer, validation, quality goals, biological variation

Hematology – Oncology

Status : Accepted - Poster Presentation

P-089

Abstract Reference : 113

Evaluation Of Automated Platelet Counting By Impedance And Optical Fluorescence Method On Sysmex XN-1000 Hematology Analyzer

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Introduction: Quantitative platelet determination is a part of the routine blood testing and is crucial in diagnosis of various haemostasis diseases as well as other illnesses associated with elevated or reduced platelet counts. Conventional hematology analyzers are providing the accurate platelet counts in normal samples. However, the problem occurs in abnormal samples, especially those with low platelet counts and measured by most commonly used principle, impedance, because of interference of nonplatelet particles. Sysmex XN-1000 analyzer (Sysmex Corporation, Kobe, Japan) with the 2 measurement methods used so far offers a new way of measuring platelet counts, fluorescence flow cytometry (PLT-F). The fluorescence marker specifically labels platelets, no other cells, which minimises interferences and allows accurate and precise platelet counts. The aim of this study was to compare the platelet values measured by two different methods on the same analyzer.

Materials and Method: Blood samples in a wide concentration range of platelets ($1-1308 \times 10^9/L$) were detected by the Sysmex XN-1000 analyzer with two methods for platelet counting: impedance (PLT-I) and fluorescence (PLT-F) method and compared using linear regression.

Results: Data obtained by measuring with two different methods were divided into 3 analysis groups according to concentration range of platelets: the whole measured range ($1-1308 \times 10^9/L$), range with extremely low levels of platelets ($1-120 \times 10^9/L$) and range with potentially normal and high levels of platelets ($121-1308 \times 10^9/L$). Passing-Bablok regressions were used to evaluate agreement between two

methods for all 3 groups. Although the analysis showed that neither constant nor proportional deviation was present (the confidence interval of the slope and intercept included the values one and zero) in all 3 analyzed groups, there was a significant difference in the measured platelet counts. In case of higher platelet counts ($TRB > 120 \times 10^9/L$), the values of measured fluorescence platelets were higher in comparison with values obtained by PLT-I method, whereas in case of extremely low platelet counts ($TRB < 50 \times 10^9/L$), values obtained by PLT-I method were slightly higher than those obtained by PLT-F method.

Conclusion: Owing to a new way of specifically marking platelets and thus avoiding falsely elevated platelet count due to the presence of large platelets and other cells or fragments of similar size, fluorescent determination of platelets has been shown to be more accurate in assessment of the platelet count in cases of low platelet values. Therefore, in our laboratory, we appointed that all low values of platelet count ($< 50 \times 10^9/L$) obtained by PLT-I method should be verified by PLT-F method. As for the higher values of platelets, a medical biochemist ought to make a decision whether to check the platelet count by PLT-F method after comparing the obtained PLT-I values with previous values and reviewing the flags on the analyser.

Keywords : Automated hematology analyzer, platelets, impedance, fluorescent method, evaluation

Hematology – Oncology

Status : Accepted - Poster Presentation

P-090

Abstract Reference : 182

The Relationship Between Vitamin D Levels and Serum Tumor Markers in Healthy Subjects

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BACKGROUND: Anti-cancer effects of vitamin D were suggested by several studies and the relationship between cancer risk and vitamin D was investigated by many studies. The studies investigating the effect of vitamin D on tumor markers are very limited. In this study, the relationship between tumor markers and vitamin D levels in healthy subjects was investigated.

METHODS: A total of 154 healthy subjects aged 18-77 years old who attended Tepecik Teaching and Research Hospital outpatient clinics were included in the study. Serum 25(OH)D, CA 15-3, CA 125, CA 19-9, CEA and AFP levels were measured electrochemiluminescence immunoassay on Cobas E601 analyzer.

RESULTS: There were no significant correlations between CA 19-9, CEA, CA125, AFP levels and serum vitamin D in male and female subjects. In Pearson correlation analyses a significant negative correlation between 25(OH)D and CA 15-3 levels was found for female subjects ($r = -0.220$ $p = 0.029$).

The relationship between CA 15-3 and vitamin D lost statistical significance when adjusted for age and BMI in multivariate regression analysis ($p = 0.133$).

CONCLUSIONS: In conclusion although not being statistically significant in age and BMI adjusted analyses a significant negative correlation between 25(OH)D and CA 15-3 was found in healthy female subjects. These results need confirmation by studies with larger sample sizes.

Keywords : Vitamin D, CA 15-3, CA 19-9, CA125, AFP, CEA

Hematology – Oncology

Status : Accepted - Poster Presentation

P-091

Abstract Reference : 221

Relationship Between Serum Paroxanase Activity And Biochemical Parameters In Beta-Thalassemia Patients

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Introduction: Beta thalassemia (β -Thal) is a chronic anemia in which while oxidants stress increases, antioxidant capacity decreases. Paroxanase is an enzyme having antioxidant properties. In this study we searched markers effecting paroxanase activity in β -Thal patients.

Materials and methods: In this study we measured serum paroxanase activity, complete blood count, fasting glucose, BUN, creatinin, sodium, potassium, chloride, calcium, AST, ALT, LDH, albumin, globulin, uric acid, indirect bilirubin, direct bilirubin, TSH, parathyroid hormone, ferritin, and vitamin B12 in 46 β -Thal patients.

Results: We found that there is a significant correlation between serum paroxanase activity, serum chloride level, and serum TSH ($r=0.319$, $p<0.05$). There is no significant correlation between serum paroxanase activity and other parameters.

Conclusion: Thyroid disorders and diseases effecting chloride levels do not effect serum paroxanase activity in β -Thal patients.

Keywords : Beta thalassemia, paroxanase activity, TSH, chloride

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P-092

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NT-proBNP levels in β -thalassemia major patients without cardiac hemosiderosis

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Introduction: Heart failure due to hemosiderosis is frequent in beta-thalassemia major (β -TM) patients. Magnetic resonance imaging (MRI) is used in the early detection of heart failure. Amino-terminal pro-brain natriuretic peptide (NT-proBNP) is a very sensitive marker in the diagnosis of heart failure. In this study, we aimed to investigate the efficacy of NT-proBNP levels in thalassemia patients, who are thought to have no cardiac iron deposition according to T2* scoring system ($CMRT2^* > 20$ msn), in early identification of cardiac failure.

Methods: NT-proBNP levels of 31 patients, who have $T2^* > 20$ ms, and of 25 healthy population were measured by chemoluminescence method.

Results: NT-proBNP levels were not different in thalassemic patients [median: 33 (IQR: 28–94) pg/mL] compared to control group [median: 41 (IQR: 28–59) pg/mL]. We found that NT-proBNP level was above cut-off value in six patients.

Conclusion: NT-proBNP is a cheaper, reachable, and noninvasive method compared to MRI technique, it can be easily used in monthly controls. Detection of high NT-proBNP levels above cut-off values in patients whose T2* values are normal indicates that measurement of NT-proBNP is a more sensitive marker in early detection of cardiac failure.

Keywords : Beta-thalassemia major; Heart failure; NTproBNP; Cut-off values; Early detection

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Expression of CD55, CD59 and CD35 on Red Blood Cells of β -thalassemia Major

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AIM: β -thalassaemia (β -Thal) is considered a severe, progressive haemolytic anaemia, which needs regular blood transfusions for life expectancy. Complement-mediated erythrocyte destruction can cause both intravascular and extravascular haemolysis. Complement regulatory proteins protect cells from such effects of the complement system. We aimed to perform quantitative analysis of membrane-bound complement regulators, CD55 (decay accelerating factor - DAF), CD35 (complement receptor type 1 - CR1), and CD59 (membrane attack complex inhibitory factor - MACIF) on peripheral red blood cells by flow cytometry.

MATERIAL AND METHODS: The present study was carried out on 47 β -thalassemia major (β -TM) patients, 20 β -thalassaemia intermedia (β -TI) patients, and 17 healthy volunteers as control subjects.

RESULTS: CD55 levels of β -TM patients ($58.64 \pm 17.06\%$) were significantly decreased compared to β -TI patients ($83.34 \pm 13.82\%$) and healthy controls ($88.57 \pm 11.69\%$) ($p < 0.01$). CD59 levels of β -TM patients were not significantly different than β -TI patients and controls, but CD35 levels were significantly lower in the β -TM patients ($3.56 \pm 4.87\%$) and β -TI patients ($12.48 \pm 9.19\%$) than in the control group ($39.98 \pm 15.01\%$) ($p < 0.01$).

CONCLUSIONS: Low levels of CD55 and CD35 in thalassaemia major patients indicates a role for them in the aetiopathogenesis of haemolysis in this disease, and also this defect in a complement system may be responsible for the chronic complications seen in these patients

Keywords : CD35; CD55; CD59; β -thalassemia

The Verification Of Differential Count And Flagging Accuracy Of 6-Part Differential Hematology Analyzer Siemens Advia 2120i

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Aim: The complete blood count (CBC) is one of the most frequently ordered laboratory tests in medicine. One of the components of CBC is the differential count. Performance assessment of the differential count is an indispensable part of the evaluation of the blood cells analysers (2014 ICSH Guidelines), prior to its routine implementation. Therefore, while assessing the performance of the back-up hematology analyser (HA) in our Department (Siemens Advia 2120i (Erlangen, Germany)) we aimed to investigate: i) the comparability of differential count of 6-part differential HA with the reference HA Siemens and ii) the flagging accuracy of a back-up HA in evaluation.

Materials and methods: We divided our study into two parts, according to described goals. To investigate the comparability of differential count of 6-part differential HA with our routine HA Siemens Advia 2120i (reference analyser), a total of 190 K₂EDTA whole blood samples (Vacutest KIMA, Italia) were analyzed for 6-part differential blood count (neutrophils, eosinophils, basophils, lymphocytes, monocytes, large unstained cells (LUC)) on both Siemens Advia 2120i HAs. For every measured parameter the mean bias (%) was calculated and compared to predefined 2016 state-of-the-art (SOTA) quality criteria by Vis and Huisman. Additionally, flagging accuracy of the back-up HA was assessed on 190 consecutive blood samples. Peripheral blood smears (stained with May-Grünwald Giemsa) were examined for all samples with manual microscopy using Motic BA410 microscope, as a reference method. Two independent experienced pathologists examined all blood smears by 100-cell differential count. The manual differential blood count was recorded, as well as the presence (or absence) of the morphology flag from the HA. Samples were divided into four categories (true positive, false positive, true negative, false negative) according to smear findings and morphology flags from the HA in evaluation. Overall flagging specificity and sensitivity was calculated, as well as the flagging accuracy for two specific flag categories: variant lymphocytes (ATYPS) and blasts (BLASTS). Calculated accuracy measures were compared to 2016 SOTA quality criteria by Vis and Huisman.

Results: The observed biases for all measured parameters of the differential blood count were within the predefined quality criteria in comparison with the reference HA, ranging from -0.1% for neutrophils to 18.8% for basophils. Flagging accuracy was as follows: specificity 86.4% (95% CI 79.9 – 91.4), sensitivity 91.7% (95% CI 80.0 – 97.7), NPV 97.1% (95% CI 92.7 – 99.2), PPV 67.7% (95% CI 54.9 – 78.8). The overall flagging accuracy was 87.6%. All values were within the desirable quality criteria. The acceptable performance was also observed for specific morphology flags: sensitivity and specificity of Advia 2120i in detecting blasts (100.0% (95% CI 59.0 – 100.0) and 98.5% (95% CI 94.8 – 98.8), respectively) and variant lymphocytes (85.7 (95% CI 42.1 – 99.6)% and 95.7% (95% CI 90.8 – 98.4), respectively) were excellent.

Conclusion: Differential blood count on our new back-up and reference Siemens Advia 2120i HA are completely comparable. Flagging accuracy of the new Siemens Advia 2120i HA meets all the predefined performance criteria. Siemens Advia 2120i is a reliable HA which may lead to the substantial reduction of the manual blood smear reviews in everyday routine.

Keywords : differential blood count, blood morphology, hematology analyser, flagging efficiency

Stability of Potassium, Calcium and Phosphorus Electrolytes in Three Different Tubes in Patients With Essential Thrombocytosis

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Aim: Essential thrombocytosis (ET) is a chronic myeloproliferative disease characterized by a steady increase in the platelet count. In literatures, it has been reported that thrombocytosis may lead to false laboratory results such as pseudohypercalcemia, pseudohyperphosphatemia and pseudohyperphosphatemia. In our study, it was planned to evaluate the stability and comparability of potassium (K), calcium (Ca) and phosphorus (P) levels in three different tubes in patients with ET.

Materials and methods: Twenty ET patients were included in the study and venous blood was collected into three tubes: serum separator tube (SST), lithium heparin tube without gel (LiH) and lithium heparin tube with barrier (Barricor). Serum and plasma samples were separated according to manufacturers' centrifugation recommendations. K, Ca and P levels of serum and plasma samples were analyzed immediately after centrifugation and at specific time points (2, 4, and 8 hours) by stand in room temperature. We calculated bias% according to the following formula: (test result - reference result) / reference result) x 100. The bias (%) limit was determined according to the biological variance-based recommendations of Ricos et al. (K=1.81,Ca=0.82, P=3.38).

Results: K, Ca and P levels in SST tube at 0, 2, 4, and 8 hours were higher than the LiH and Barricor. K, Ca and P levels were the statistically different among in three tubes at the zero time point. K and Ca levels were not significantly changed at 2,4 and 8 hours in SST tube. The significant changes in K and Ca levels of LiH and Barricor tubes were observed at 8 hours, but only in LiH tube's for K was higher than the allowed bias. P levels increased significantly after 8 hours in all of tubes, but only bias of LiH was higher than allowable bias.

Conclusion: ET associated pseudohypercalcemia, pseudohyperphosphatemia and pseudohyperphosphatemia may impose diagnostic challenges and, if unrecognized, may impose a huge burden on patient care. Previous studies have suggested the LiH tube for the measurement of these electrolytes in ET patients. However, in our study, the stability of the barricor tube was better than that of the LiH tube, especially for K and P. Thus, the Barricor tube may be more useful to prevent spurious elevations in the measurement of K and P levels in ET patients.

Keywords : Essential thrombocytosis, Barricor, Pseudohypercalcemia

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Serum Total and Low-density Lipoprotein Levels Contribute to Mobilisation Process by Increasing the Number of Peripheral Blood CD34+ Cells

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Aim: Few studies investigated the effect of cholesterol levels on hematopoietic stem cell mobilisation in patients with different hematologic disease and the results are controversial. In this study, we aimed to compare peripheral blood CD34+ cell number in patients with pure hypercholesterolemia and healthy subjects.

Materials and Methods: 56 patients (mean age : 52 years, Female / Male: 35/21) with only hypercholesterolemia (without use of any drugs) and 56 normocholesterolemic healthy subjects (mean age : 44 years, Female / Male:31/25) were included in the study. Peripheral blood CD34+ cell count was done by a flow cytometer (FACSAria, BD). Serum total cholesterol, LDL-cholesterol, HDL-cholesterol and triglyceride levels were measured by photometric techniques on an autoanalyser (Roche Diagnostics, Germany). For statistical analysis non-parametric tests were used and p<0.05 was accepted as the level of significance. All results were expressed as mean ± standard error. This project was supported by Turkish Hematology Society (Project number: 2013/5)

Results: Peripheral blood CD34+ cell count was higher in patients with hypercholesterolemia when compared to the healthy group (2.6±0.34 /µL vs 1.7±0.14 /µL, respectively, p= 0.006). Patients with higher LDL-cholesterol levels displayed higher peripheral blood CD34+ cell count when compared to the healthy group 2.6±0.35 /µL vs 1.7±0.14 /µL, respectively, p= 0.003). No significant difference was obtained in peripheral blood CD34+ cell count with respect to HDL-cholesterol or triglyceride levels.

Conclusion: Increased total cholesterol and LDLcholesterol levels in hypercholesterolemic patients contribute to peripheral blood CD34+ cell number resulting in a successful stem cell mobilisation. Our data support previous findings demonstrated in animal studies where cholesterol was shown to effect the chemokine axis (CXCR4-CXCL12) between the stem cell and its niche. Our data may have some implications in clinical settings (e.g. high cholesterol diet) especially in patients with unsuccessful mobilisations.

Keywords : cholesterol, stem cell, mobilisation

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P-097

Abstract Reference : 416

Tumor Markers Test Results Of Patients With a Request Of Fecal Occult Blood

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Aim: Screening for fecal occult blood has been demonstrated to be effective in reducing the colorectal cancer mortality. Besides, several tumor markers have been studied for early diagnosis of colorectal cancers. CEA, AFP and CA 19-9 are most commonly used markers for colorectal cancers. In this study, our aim was to evaluate in patients with a request of fecal occult blood tests and find out the rate of positivity of tumor markers results.

Materials and Methods: Eleven thousand eight hundred and twenty eight patients who admitted to Bilecik Government Hospital between January 2014 and May 2018 were screened retrospectively. From these patients, 186 patients who have fecal occult blood test request, CEA and CA 19-9 markers were evaluated.

Results: No significant difference was observed between serum CA 19-9 of patients with negative test and serum CA 19-9 of patients with positive test (respectively [5(2-176)] and [8(1-240)] U/mL, $p=0.103$). No significant difference was observed between serum CEA of patients with negative test and serum CEA of patients with positive test (respectively [1.88(0.1-25)] ve [2.18(0.5-10)] ng/mL, $p=0.483$). The percentage of patients with a positive test result over 35 ng / mL of CA19-9 was found % 7.69. The percentage of patients with a negative test result over 35 ng / mL of CA19-9 was found % 5.44.

Conclusions: Tumor markers other than PSA should not be used for screening. The levels of tumor markers can be affected by many pathological conditions other than cancer so these factors should be taken into account when evaluating clinical conditions.

Keywords : fecal occult blood test, CA 19-9, CEA

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P-098

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Diagnostic Accuracy Of Siemens Advia 2120i Hematology Analyzer In Detecting Pseudothrombocytopenia

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Aim: The aim of the study was to investigate the diagnostic accuracy of Siemens Advia 2120i hematology analyzer in detection of pseudothrombocytopenia.

Materials and methods: Total of 160 K₂EDTA whole blood samples (platelet count $<100 \times 10^9/L$) were included. All samples were inspected for presence of platelet clumps in peripheral blood smears (stained with May-Grünwald Giemsa) with manual microscopy using Motic BA410, as a reference method. The presence of the two categories of flags (platelet clumps and large platelets) were recorded. Specificity and sensitivity for each flag category, as well as for their combination, were calculated. Criteria for sensitivity and specificity (2016 state-of-the-art by Vis and Huisman) were $>80\%$ and $>98\%$, respectively.

Results: Platelet clumps were confirmed in 10/160 and large platelets in 9/160 samples. Specificity of Advia 2120i in detecting platelet clumps was excellent (>99%), while sensitivity was poor (36%). The sensitivity and specificity of Advia 2120i in detecting large platelets were satisfactory (82% and 88%, respectively). Combining both flags as an alert for peripheral blood smear review, improved the diagnostic accuracy of detecting platelet clumps in patients samples (specificity 99%, sensitivity 83%) as some of the truly positive samples had overlaps between clumps and large platelets.

Conclusions: Siemens Advia 2120i hematology analyzer has acceptable accuracy in detection of pseudothrombocytopenia, with a false negative rate of 16.7% (2/12 samples). Based on these results, our laboratory protocol is to perform microscopic examination of all samples with platelets count $<100 \times 10^9/L$ if either of the morphology flags (platelet clumps and large platelets) is reported by the analyser.

Keywords : hematology analyser, pseudothrombocytopenia, flagging efficiency

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P-100

Abstract Reference : 103

The Determination Of Serum And Bronchoalveolar Lavage Fluid Vasohibin-1 Levels In Patients With Lung Cancer

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INTRODUCTION AND PURPOSE: Lung cancer is widespread all over the world and is the leading cause of cancer-related deaths . Vasohibin-1 (VASH-1) is synthesized by endothelial cells (ECs) and acts as inhibitory factor for angiogenesis. At the same time, it plays a role in the preservation of blood vessel integrity and ensuring of maturation, which has a critical role in increasing the stress tolerance of ECs .The purpose of this study was to investigate the diagnostic value of serum and bronchoalveolar lavage (BAL) VASH1 levels in lung cancer patients.

MATERIALS AND METHODS: 43 patients with lung cancer and 39 patients with benign lung diseases who applied to the chest diseases polyclinic were included in this study. Serum and BAL VASH-1 levels were measured with enzyme linked immunosorbent assay (ELISA). SPSS 20.0 for Windows" (SPSS Inc., IL, USA) program was used for recording data and statistical evaluations. The normal distribution suitability of the variables was assessed by the Kolmogorov-Smirnov test. Nonparametric Mann Whitney-U test was used. Correlation between the parameters was assessed by Spearman correlation analysis.

RESULTS: In lung cancer group, BAL VASH-1 levels were significantly less than in the people with benign lung diseases ($p=0,032$). There were no significant difference between patients with lung cancer and individuals with benign lung diseases in terms of serum VASH-1 concentrations. ($p=0,206$). There was a significant, moderate, positive correlation between serum VASH1 and BAL VASH1 levels in malign and benign cases.

When patients with lung cancer were classified on the basis of pathological ‘stages’ and histological types, there was no significant difference in terms of serum and BAL fluid VASH1 concentrations between stages and histological types. When smokers compared to non-smokers, it was found that smokers had a significant decrease in BAL fluid VASH1 concentrations ($p=0.04$).

DISCUSSION AND CONCLUSION: BAL VASH1 concentrations decreased in lung cancer when compared to individuals with benign lung diseases. However, no difference was determined in terms of serum VASH1 concentrations in these groups. According to the this study, BAL VASH1 concentrations may be useful in differentiating benign and malign diseases of the lung.

Keywords : Lung cancer, bronchoalveolar lavage, vasohibin-1

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P-101

Abstract Reference : 405

An Investigation Of Genetic Mutations In Patients With Thalassemia Who Applied To Mustafa Kemal University Faculty Of Hospital: A Retrospective Study

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Aim: Thalassemia, the most common hereditary disease in the world, is a very important health problem. Most of the thalassemia carriers are present in the Cukurova region (between 2-10 %), especially in Hatay province. In this retrospective study, we aimed to evaluate the demographic data, molecular mutations and erythrocyte indices and genotype-phenotype relationship of patients with α and β thalassemia.

Materials and Methods: All demographic and laboratory data of the patients were collected by the Hospital Information System (HBYS) between 2017 and 2018. A total of 351 subjects were evaluated. Study group consisted of 83 patients with α -thalassemia and 118 patients with β -thalassemia. Age and gender matched 150 healthy controls were included in the study. Hemoglobin β gene mutations were examined by gene sequence analysis. Whole blood samples were collected with EDTA containing tubes and hemogram parameters were assayed by complete blood count analyzer. All obtained data were compared statistically.

Results: Of the 351 patients, 185 (52.7%) patients were male, 136 (47.3%) patients were female and the mean age was 28.9 ± 10.9 . The most common α -thalassemia mutations were 3.7 kb Heterozygous (87.95 %), 3.7 kb homozygous (8.44%) and 20.5 kb Heterozygous (3.61 %). β -thalassemia mutations were evaluated in five groups: 41.5% Codon, 19.5% IVS1-110 (Intron), 11.02 % Promoter Region, 9.32 % UTR and 18.6 % other. In patients with α -thalassemia; the mean HbA₂ value was 1.98 ± 0.37 , the HbF value was 0.42 ± 0.57 . In patients with β -thalassemia; the mean HbA₂ value was 4.27 ± 1.27 and the HbF value was 1.42 ± 1.79 . Both parameters were statistically lower in patients with α -thalassemia ($p < 0.001$). Hemoglobin indices (Hb, Hct, Rbc, MCV, MCH, RDW) of thalassemia and control group were compared with the Kruskal Wallis test and there was statistically significant difference between the groups for each parameter $p < 0.001$. Hb and Hct values were significantly lower in the α -thalassemia group than those of other groups ($p < 0.001$). The mean Rbc count in α -thalassemia group is lower than those of β -thalassemia group, the mean MCV value is significantly lower than control group. RDW was significantly higher in α and β -thalassemia groups compared to the other groups ($p < 0.001$). In β -thalassemia mutation subgroups, there was a significant difference for Rbc, Hgb, Hct and MCH parameters ($p < 0.05$).

Conclusion: HbA₂ and HbF values were found to be important parameters for the differential diagnosis of α and β -thalassemia, as expected. It was also determined in this study that MCV and RDW values are also important criteria to distinguish carrier patients. The most common α -thalassemia mutation type was 3.7 kb heterozygous mutation (87.9%), which is consistent with the previous studies conducted in this area.

These mutations were different from those of other regions of Turkey and resulted from the geographic and ethnic variability in Hatay province. In conclusion, we suggest that both phenotype and genotype assessment is valuable in the management of thalassemia patient surveillance.

Keywords : Alpha and Beta thalassemia, Hemogram indices, Mutation types, Hatay

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P-102

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An 84-Year-Old Man With Acquired Factor VIII Inhibitor

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Aim: Acquired hemophilia A is a rare bleeding disorder caused by autoantibodies directed against coagulation factor VIII (FVIII) and associated with an increased morbidity and mortality. Although it may be associated with several underlying pathologies, up to 50% of reported cases remain idiopathic. Here, we report a case of 84-year-old man presenting with a broad hematoma on his left shoulder and upper arm secondary to acquired inhibitors against FVIII.

Materials and Methods: An 84-year-old white man presented with a broad hematoma on his left shoulder and upper arm which was complicated with severe anemia. The patient had no history of bleeding disorders. Initial coagulation screening revealed normal prothrombin time and a prolonged activated partial thromboplastin time (aPTT) of 62.1 seconds (reference interval 22.5-31.3 seconds). 50:50 mixing study revealed with a near normal aPTT immediate mix (38.1 seconds), but an abnormal aPTT incubated mix (80.8 seconds) which indicated the presence of a delayed inhibitor such as specific factor inhibitors.

Results: Further hematological workup revealed with reduced FVIII activity (0.7 %; reference interval 70-150 %) and raised FVIII inhibitor titer (53.7 BU/mL) confirmed a diagnosis of acquired hemophilia A. After admission to emergency service three packets of red blood cells were transfused since the hemoglobin level was 5.7 g/dL in the complete blood count. Computed tomography did not show any evidence of internal malignancy. The clinical and laboratory investigations didn't show any collagen vascular disease.

Conclusion: It is known that first line immunosuppressive treatment of factor eradication should be corticosteroids. Therefore high dose methylprednisolone of 500 mg for two days was administered for immunosuppression to aim the eradication of the autoantibody or the suppression of the cell clone responsible for its synthesis. Thereafter 1 mg/kg per day methylprednisolone was initiated. Eradication of FVIII inhibitor was achieved on the 4th week. Hematoma was settled in the course of two weeks. After eradication of FVIII inhibitor and gaining a satisfactory level of FVIII (77.7 %), methylprednisolone dose was tapered gradually. But aPTT prolongation was revealed during tapering steroid. Factor assay demonstrated FVIII deficiency of 0.9 % and FVIII antibodies of 5.1 BU/mL on Bethesda testing which confirmed a relapsed disease. High dose methylprednisolone and anti-CD20 antibody were initiated. Immunosuppressive therapy with cyclophosphamide or azathioprine was not given due to poor performance of 84-year-old elderly patient. For this reason anti-CD20 antibody (Rituximab) was administered. After four cycles of rituximab, complete response was achieved. Patient is in a good condition and still on a close follow up.

Keywords : Factor VIII inhibitor, acquired hemophilia A, aPTT prolongation

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P-103

Abstract Reference : 286

Hemoglobin G-Coushatta As The Cause Of A Falsely Decreased Hemoglobin A1c in Ion-Exchange HPLC Method

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Glycated hemoglobin (HbA1c) is used for the assessment of glycemic control in patients with diabetes. The presence of genetic variants of hemoglobin can profoundly affect the accuracy of HbA1c measurement. Here we report two cases of Hemoglobin G- Coushatta (HBB:c.68A>C) variant that interferes the measurement of HbA1c by cation-exchange HPLC (CE-HPLC) method. HbA1c was measured by CE-HPLC method in Tosoh HLC-723 G7 instrument. The HbA1c levels were 2.9% and 4%. These results alerted us for a possible presence of hemoglobinopathy. In the hemoglobin variant analysis; HbA2 levels were detected as 78.3% and 40.7% by HPLC using the short program for the Biorad Variant II. HbA1c levels were measured by immunoturbidimetric assay in Siemens Dimension instrument. HbA1c levels were reported as 5.5% and 5.3% DNA mutation analysis was performed to detect the abnormal hemoglobin variant. Presence of Hemoglobin G-Coushatta variant was detected in the patients. The Hb G- Coushatta variants have an impact on the determination of glycated hemoglobin levels using CE-HPLC resulting in a false low value. Therefore, it is necessary to use another measurement method.

Keywords : Hb G- Coushatta (HBB:c.68A>C), HbA1c , Cation-exchange HPLC

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P-104

Abstract Reference : 305

M Protein; A Potential Cause Of Analytical Interference

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Aim: Analytical interference, either immunologic or spectrophotometric, is a major cause of errors in analytical phase. In this study, we aimed to evaluate potential myeloma immunoglobulin (M protein) interference for total bilirubin, aspartate aminotransferase (AST), lactate dehydrogenase (LDH), alanine aminotransferase (ALT) and gamma glutamyl transferase (GGT).

Material and Method: The information of patients who had positive urine immunofixation electrophoresis (IFE) for M protein (either kappa or lambda chain, or both) during 2015, 2016 and 2017 years was obtained from Manisa Celal Bayar University Hafsa Sultan Hospital laboratory information system (LIS). The results of 5 analytes, if the patient had the tests assessed with IFE simultaneously, were also obtained from LIS, retrospectively. The control group is randomly selected from people of similar age and gender (2 controls for 1 M protein positive patient), who had no hepatobiliary or hematological conditions.

Results: The means of 5 analytes for M protein positive group (n: 138) and control group (n: 278) were as follows, respectively; total bilirubin (0.5– 0.62 mg/dl), AST (25.1 – 21.2 mU/ml), LDH (168 – 189

mU/ml), ALT (18.4 – 17.6 mU/ml), GGT (22.8 – 25 mU/ml). From the 5 biochemistry analytes we evaluated, 3 had significant differences (total bilirubin, AST and LDH) between two groups ($p < 0.005$ for all). For ALT and GGT, there were no significant difference between groups.

Conclusions: The results of our study suggest that M protein may cause negative analytical interference for total bilirubin and LDH, and positive interference for AST. To obtain more comprehensive data, further studies about M protein interference are needed and the molecular mechanisms of such potential interferences remain to be discovered.

Keywords : Keywords: M protein, immunofixation electrophoresis, analytical interference

Hematology – Oncology

Status : Accepted - Poster Presentation

P-105

Abstract Reference : 308

Distribution Of Blood Groups In Eskisehir

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Aim: Knowing the distribution of blood groups may be useful for individual needs and blood center operations. We aimed to determine the actual frequency of the blood groups in Eskisehir.

Materials and Methods: All individuals (63.159) who admitted to the Eskisehir Osmangazi University Medical Faculty Hospital between 2010-2017 and whose blood groups were known were included in the study. The distribution of ABO and Rh blood groups according to their phenotypes were examined retrospectively.

Results: 44.7% of the individuals were determined as A, 30.7% as O, 16.5% as B, 8.1% as AB blood group. 87.8% Rh (+) and 12.2% Rh (-) blood groups were detected. 18.5% of individuals were under age of 18 and according to distribution of blood groups, there is no significant difference between the under and upper of the age of 18 ($p > 0.05$).

Conclusion: In some studies, it was found that the frequency of A and O blood groups decreased from west to east of our country and B blood group increased. Although these studies are parallel to the research data that we have made in Eskisehir, further researches are needed to reach a clear result in terms of ethnicity due to migrations.

Keywords : ABO, Rh, blood group, Eskisehir

Qualitative Screening Of DOAC-Induced Anticoagulation In Emergency Clinical Situations

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Background: The use of direct oral anticoagulants (DOACs), i.e. dabigatran (DBTN), apixaban (APBN), rivaroxaban (RXN), continues to increase in the Baltic countries. In general, DOACs do not require routine laboratory monitoring. Normal PT and APTT lack specificity to rule out DOACs-induced anticoagulation and may be prolonged due to causes other than the presence of DOACs. However management of patients receiving DOACs in emergency clinical situations, including bleeding, need for thrombolysis and urgent invasive procedures, may be complicated and it is important to know their impact on routine coagulation testing.

Aim: The aim of the present study was to assess the impact of the DOACs on hemostasis testing.

Methods: The data of 143 emergency department patients, to whom stroke panel tests (on 24/7 available assays: prothrombin time (PT-INR), activated partial thromboplastin time (APTT), thrombin time (TT), and low-molecular-weight heparin (LMWH)) have been ordered (group 1), and 175 patients, who were treated with DOACs (DBTN n=66, RXN n=50, APBN n=59) (group 2) during a period September 2016 – April 2018, was investigated. Contraindications for thrombolytic therapy, based on TT and LMWH anti Xa results, in group 1 were checked. Impact of DOACs on PT-INR and APTT results in group 2 was analyzed. All reagents used in the study originated from Diagnostica Stago (France): PT-INR (STA-SPA+), APTT (STA-PTT A), TT (STA-Thrombin) and LMWH (STA-Liquid Anti-Xa, calibrated with the Multi Hep calibrator), RXN and APBN (STA-Liquid Anti-Xa, calibrated with relevant drug-specific calibrators), and DBTN (ecarin-based chromogenic assay by STA-ECA II). All measurements were performed on STA-R Evolution analyzer (Diagnostica Stago, France). LMWH anti-FXa assay results of < 0.1 IU/mL were considered not to have clinically relevant levels of RXN and APBN, and TT < 21 seconds to rule out the use of DBTN.

Results: In 11 (7.8%) group-1 patients thrombolysis was contraindicated based on the values of TT or LMWH. In 2 DBTN treated patients TT was above 21 seconds. In one of them PT-INR was normal. In 9 RXN or APBN treated patients LMWH Anti-FXa was above 0.1 IU/mL, while in 7 of them PT-INR and in 5 of them APTT was normal. In patients receiving DOACs (group 2) the PT-INR and APTT results behaved differently.

Conclusion: For semiquantitative purposes TT and LMWH-calibrated anti-FXa assays can be used as first-line tests in emergency clinical situations to screen the use of DOACs. But this strategy should be locally validated in each laboratory taking into account the difference of the sensitivity of DOACs methods. DOACs do impact PT-INR and APTT values, but effect is non-consistent making assays unreliable in emergency situations.

Keywords : Direct oral anticoagulants, laboratory monitoring, emergency clinical situations

Hemostasis and Thrombosis

Status : Accepted - Poster Presentation

P-107

Abstract Reference : 96

Investigation of the Relation Between Glycated Hemoglobin And Mean Platelet Volume

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Aim: Hemoglobin A1c (HbA1c), also known as glycated hemoglobin, indicates the blood glucose control over the last 8-12 weeks. HbA1c level is a useful marker for the monitoring of the diabetic patient and shows the necessity of any adjustment to the treatment has to be made. Mean platelet volume (MPV) is a marker of platelet function and activation which is determined by automated blood cell counters inexpensively. In the present study, our aim was to investigate the correlation between MPV and HbA1c and to evaluate the effect of different glycemia levels on mean platelet volume levels.

Materials and Methods: HbA1c and MPV results of 3647 people (1391 male, 2256 female) were obtained retrospectively from laboratory information system. The data was grouped according to HbA1c levels as follows: group A HbA1c < 7%, group B 7-9%, group C > 9%. HbA1c, MPV and glucose levels were determined with HPLC, impedance and hexokinase methods, respectively. The statistical comparisons between the groups were made by Mann Whitney-U test and the correlations between the variables were made by Spearman test. A p value of <0.05 was considered as significant.

Results: It was seen that the levels of MPV increased as HbA1c levels increased. There was a statistically significant difference in MPV levels between groups A vs C and B vs C, (p<0.05), but not A vs B (p>0.05). In group B, MPV showed statistically significant positive correlation with HbA1c (r = 0.076, p=0.016) and also with fasting glucose (r = 0.077, p=0.016).

Conclusion: Our data show that exposure of platelets to high glucose levels leads to increase in MPV levels which in turn disrupts the normal behavior of platelets creating platelet hyper reactivity. Keeping blood glucose levels in acceptable limits has great importance in preventing platelet hyper reactivity and lowering the risk of clot formation in diabetic patients. MPV may be considered to be a candidate marker for vascular complications especially in diabetes mellitus.

Keywords : HbA1c, glycated hemoglobin, MPV, diabetes mellitus, glycemic control

Hemostasis and Thrombosis

Status : Accepted - Poster Presentation

P-108

Abstract Reference : 197

Evaluation Of Plasma Fibrinogen Levels In Patients With Primary Open-Angle Glaucoma

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Background: Patients followed up at our ophthalmology out-patient clinics were included our study. Data including drug/smoking/illness history, demographic information, waist circumference, height-weight, blood pressure measurements and ophthalmologic measurements were all recorded.

Methods: All the cases were investigated in two groups: Group 1 (control group); non-diabetic healthy individuals (N=37) and group 2; patients diagnosed primary open-angle glaucoma (N=71). According to the spectral domain optic coherence tomography measurements of the retinal nerve fiber layer thickness (RNFL), we classified patients into two subgroups; one whose RNFL \geq 87 μ m (N=31) and the other whose RNFL $<$ 87 μ m (N=34). Routine biochemistry tests and fibrinogen were measured.

Results: There was no difference in gender, body mass index, waist circumference and sLDL-C values between the groups. Patients had significantly higher systolic blood pressure and diastolic blood pressure values. Patients with OCT $<$ 87 μ m had higher fibrinogen levels than the controls. There was also some correlations between fibrinogen and age (r=0.377, p=0.034), total cholesterol (r=0.365, p=0.040), triglyceride (r=0.435, p=0.013), low-density lipoprotein cholesterol (r=0.379, p=0.032) and urine protein/creatinine (r=0.358, p=0.048) in the subgroup of patients with OCT $<$ 87 μ m.

Conclusion: Further investigations are needed to show whether other endothelial or inflammation biomarkers meaningful in progression of primary open-angle glaucoma and to support vascular/ischemic theory.

Keywords : fibrinogen, inflammation, primary open-angle glaucoma, retinal nerve fiber layer.

Hemostasis and Thrombosis

Status : Accepted - Poster Presentation

P-109

Abstract Reference : 223

A Novel Method For Negating Cold Agglutination Interference By Dithiothreitol During Complete Blood Count And Peripheral Blood Smear: A Case Study

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Cold agglutinin disease is an autoimmune disorder that is characterized by antibodies attacking polysaccharide antigens on one's own erythrocytes. In cold agglutinin disease, hemolysis occurs due to degeneration of erythrocyte membranes and autoagglutination of erythrocytes. Both autoagglutination and hemolysis alter many laboratory test results of the patients, especially complete blood count (CBC) and peripheral blood smear analyses. In our laboratory, we have encountered a blood sample of a 65-years-old

man, who was independently diagnosed with cold agglutinin disease, and failed to produce meaningful CBC or peripheral blood smear analysis. Fresh blood samples were taken from the patient, and CBC and peripheral blood smear analyses were repeated with and without water bath incubation at 37 °C. Also, varying amounts of dithiothreitol (DTT) were added to fresh samples without heat treatment prior to blood analysis. Heat treatment at 37 °C for varying lengths of time failed to improve CBC and peripheral blood smear analysis. On the other hand, addition of DTT into a blood sample of 2 ml in a K3-EDTA tube was sufficient to negate cold agglutination interference during both CBC and peripheral blood smear analyses. The presented method supports the potential for DTT to be used in negating cold agglutination interference during CBC and peripheral blood smear analyses of patients with cold agglutinin disease. The method we describe is very easy and quick with remarkable results.

Keywords : Cold agglutinin disease, dithiothreitol, complete blood count, hemolysis, autoagglutination

Hemostasis and Thrombosis

Status : Accepted - Poster Presentation

P-110

Abstract Reference : 112

Implication Of eNOS Polymorphism And Hyperhomocysteinemia In Deep Vein Thrombosis

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Aim: Deep vein thrombosis (DVT) is a multi-causal disease involving genetic as well as acquired risk factors. Hyperhomocysteinemia is associated with a two fold increased risk of DVT. Recently, the endothelial nitric oxide synthase (eNOS) gene variants G894T and T-786C were postulated to be associated to DVT. The aim of our study is to assess an interrelation between hyperhomocysteinemia, the both eNOS polymorphism G894T, T-786C variants and DVT risk.

Materials and Methods: We conducted a retrospective case-control study including 32 patients with DVT and 31 healthy control subjects. Clinical and biological characteristics were collected. Homocysteinemia (tHcy) was measured using an immune competitive enzymatic chemiluminescence technique. Genotyping for polymorphisms was performed by polymorphism chain reaction (PCR) and restriction fragment polymorphism method.

Results: We found that the eNOS 894G/T genotype was significantly increasing the risk of DVT (p=0,03 OR=3,9; 95% CI). However, no association of the eNOS T-786C polymorphism variant and DVT was found. The tHcy were similar between patients (15.45±7.76µmol/l) and controls (16.03±8.31µmol/l). No significant association between tHcy levels and eNOS genotypes could be evidenced.

Conclusion : The eNOS 894G/T polymorphism leads to an increased risk of deep vein thrombosis and may be considered as a risk factor but this is not the case for the T-786C polymorphism. The complexity of the disease and the limited number of patients do not allow as identifying an association between eNOS gene polymorphism and tHcy levels, wider studies should be carried out.

Keywords : Deep vein thrombosis- eNOS polymorphism- hyperhomocysteinemia

Hemostasis and Thrombosis

Status : Accepted - Poster Presentation

P-112

Abstract Reference : 218

Hyperbaric Oxygen Therapy Is Associated With Lipid Inflammatory Response Assessed Using Serum Platelet Activating Factor

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Hyperbaric oxygen (HBO) treatment is generally a relatively safe therapy for various conditions. However, there are some adverse side effects. HBO has been shown to enhance the anti-oxidative defense mechanisms in some animal studies; HBO has also been reported to increase the production of oxygen radicals. Because, HBO treatment, results in elevated production of reactive oxygen species (ROS), that leads to cellular damage. Our hypothesis was that PAF and OxLDL would continue to rise with increasing oxygen pressures in contrast to anti-oxidative defense whose function would be reduced. Furthermore, to our knowledge, no research have been previously carried out which have studied the involvement of PAF as the lipid oxidative stressor in patients with HBO treatment. A total of 45 patients who met the research criteria were included in the study. That is, the two groups were produced as follows; the first group before treatment and the second group more than 20 sessions. Laboratory parameters for inflammation and lipid oxidative stress were obtained at these specific time points during HBO therapy. For this purpose, we measured serum levels of PAF, OxLDL and routine laboratory parameters. First, according to the results, HBO treatment does not have any effect on routine lipid and non-lipid laboratory parameters. As expected long term HBO treatment has no effect on OxLDL which is alipid oxidative stress marker. However, the mean PAF values in the second group were statistically significantly increased than their pre-treatment values ($P < .001$). Our results clearly show that long term HBO treatment does have lipid inflammatory effects in patients with different pathologies. Whereas most of the patients included in the study had favorable response to the treatment. While, an important side effect was not observed in patients. The pro-inflammatory role of PAF may include the production of oxygen-derived free radicals. Thus, there are various mechanisms by which PAF may affect hyperoxic toxicity. PAF-forming cells may have affected oxygen toxicity, but the mechanism of their pathophysiological roles are not fully understood. As this is a preliminary study, in which there is a need for more detailed investigations that demonstrates the association of HBO treatment with the inflammatory response. Because, inflammation is maybe indicated by a local increase in lipid mediators such as PAF.

Keywords : reactive oxygen species, Hyperbaric oxygen treatment,platelet activating factor,

Is There An Additional Clinical Value Of Lipopolysaccharide-Binding Protein In Identification And Outcome Prediction Of Patients With Severe Sepsis? – A Case Report

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AIM: Sepsis is still the main cause of death in surgical intensive care unit (ICU) with continuously increasing incidence and mortality rate. Therefore, both early diagnosis and prognosis of sepsis are of great importance. In addition to procalcitonin (PCT), C-reactive protein (CRP), leukocytes and lactate, novel studies propose lipopolysaccharide-binding protein (LBP) as a sensitive marker for bacterial infection and possibly useful follow-up parameter of sepsis. The aim of this report is to investigate the additional clinical value of LBP to PCT, CRP, leukocytes and lactate in identification and outcome prediction of a patient with severe sepsis.

PATIENT AND METHODS: A 74-year old male patient was admitted to ICU after major open-heart surgery. Seventeen days after surgery, severe sepsis with *Pseudomonas aeruginosa* infection was diagnosed. In the 10 following days before patients' death concentrations of PCT (CLIA, Siemens Advia Centaur XP), CRP (immunoturbidimetry, Beckman Coulter AU680), leukocytes (optical count, Siemens Advia 2120i), lactate (photometry, Beckman Coulter AU680) and LBP (CLIA, Siemens Advia Centaur XP) were measured. The results were compared using the Reference Change Value (RCV), $Z=1.96$. Obtained RCVs for PCT, CRP, leukocytes, lactate and LBP were 49%, 138%, 32%, 76% and 42%, respectively. These values were considered clinically significant. Sepsis-related Organ Failure Assessment (SOFA) score was calculated on the day of diagnosis.

RESULTS: Measured values of all analytes on the first day of diagnosis were: CRP (138.8 mg/L), PCT (14.7 ng/mL), leukocytes ($4.6 \times 10^9/L$), lactate (2.32 mmol/L) and LBP (45.9 $\mu\text{g/mL}$). Calculated SOFA score was 17 with estimation of mortality higher than 90%. The highest levels of CRP (298.6 mg/L), lactate (17.9 mmol/L) and leukocytes ($16.6 \times 10^9/L$) were measured on the 3rd day showing clinically significant difference for leukocytes and lactate compared to the 1st day. CRP showed no significant difference within all 10 days. The highest values of PCT (32.85 ng/mL and 26.77 ng/mL) were on 2nd and 3rd day showing significant change and an expected continuous decrease in the following days, whereas LBP did not change significantly.

CONCLUSION: Values for PCT, CRP and lactate remained within their pathophysiological dynamics as was expected due to the patients' condition and performed therapy. However, as leukocytes increased after the 5th day and LBP did not significantly decrease in all 10 days, these two parameters could be considered as predictors of fatal outcome in this case report. Also, as an increase of LBP was not observed, it is to presume that LBP starts to increase before PCT and CRP, and can help in identifying patients that are likely to develop severe sepsis days before other mentioned parameters. These results are in agreement with several studies but further research in this field is needed.

Keywords : sepsis, lipopolysaccharide-binding protein, procalcitonin, intensive care unit

Intensive Care Medicine

Status : Accepted - Poster Presentation

P-114

Abstract Reference : 316

The Relation Of NT- proBNP Levels And CRP In Patients With Rheumatoid Arthritis

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Objective : Patients with rheumatoid arthritis who have persistent high levels of inflammation are at greater risk of developing cardiovascular disease. Increased concentrations of N-terminal pro-brain natriuretic peptide (NT-proBNP) are associated with cardiovascular morbidity. In this study we aimed to investigate the relationship between C reactive protein (CRP) and NT-proBNP levels.

Method: Seventy-seven patients, who were diagnosed with rheumatoid arthritis were included in this study. Blood samples were drawn from patients. CRP was measured by nephelometric method, NT-proBNP levels were measured by chemiluminescence method. Data were analysed by SPSS (version 18). $p < 0.05$ was accepted as statistically significant.

Results: Seventy-seven patients (69 females, 8 males) were included in this study. Mean age was 50.94 ± 10.87 (20-68). CRP level was 1.3 ± 0.51 mg/dl. NT-proBNP levels were 61 ± 59.91 pg/ml. There was a positive correlation between NT-proBNP levels and CRP levels.

Conclusion: In established RA, NT-pro-BNP was associated with C reactive protein. Inflammation has been proposed as an important contributor to the pathogenesis of cardiac dysfunction in RA patients.

Keywords : Rheumatoid Arthritis, NT-proBNP, CRP

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-116

Abstract Reference : 41

Quality Indicators Of Preanalytical Phase At The Multiprofile Laboratories Of Regional Hospitals

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Purpose: The aim of the studies was to determine the errors' number in the preanalytical phase as the stage of the laboratory tests' quality improving at the Regional Hospitals.

Materials and methods: We have analyzed the frequency and causes of preanalytical defects of laboratory tests from different Departments of Regional Hospitals (surgery, therapeutic and intensive care unit) during 3 months. We investigated more than 250 blood's samples per days in our laboratories. We used the formula for calculating number of defects: $(100 \times \text{numbers of defects}) / \text{numbers of investigation's requests}$.

Results: We estimated the numbers of sample's Quality Indicators (QIs) on preanalytical phases of the laboratory tests. It was embedding QIs for preanalytical phase for biochemical and hemostasis indexes, hematological examination. We used QIs and numbers of defects (%) in our laboratories. It were the number of lipemic serum samples (4,5%); number the samples with hemolysis (5,2%), presence of

clotting in samples with anticoagulant (8,3%), presence of micro clotting in samples for hematologic analyses (2,2%); incorrect ratio of blood/anticoagulant (4,3%); wrong labels on test-tubes (0,2%); test-tubes were absent but physician requests were present (0,05%).

Conclusions: It were detected more frequently the clotting in samples with anticoagulant in study. Research of phlebotomist and collaboration with Departments may be useful for introduction of laboratories QIs and helpful in reducing the number of the preanalytical errors. It is important to use checklists for preanalytical phase at the Clinical Departments and for preanalytical phase at the laboratories. Adequately collected, labeled and transported laboratory tests are helpful for reliable results on analytical phase.

Keywords : Quality Indicators (QIs), preanalytical phase.

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-117

Abstract Reference : 47

Free Prostate Specific Antigen Test Requests And Rational Laboratory Usage

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Aim: Unnecessary free PSA requests create burdens for clinic laboratories. According to the guidelines, when the total PSA is between 4 and 10 ng/mL, a free PSA result is needed for differential diagnosis. In practice, a free PSA test is required regardless of the total PSA result. We aimed to examine the free PSA ratio that was unnecessary in our hospital.

Materials and Methods: Patients who were asked for total and free PSA tests together for one year were studied.

Results: 7,954 total PSA- free PSA tests were requested together in the last year. 1,084 total PSA test results of 7,954 total and free PSA requests were between 4 and 10 ng/mL(13.6%). The remaining 6,870 total PSA tests with free PSA were either less than 4 ng/mL or greater than 10 ng/mL. In this circumstances, 6,870 free PSA tests were requested unnecessarily (except for a few exceptions, there are some exceptions). 18.3%(841) of the free PSA tests from the urology clinic and 7.2%(243) from other clinics were found that their total PSA results between 4 and 10 ng/mL and reasonable for the indication. The remaining 3,751 free PSA tests (81.7%) from urology department and 3,119 free PSA tests (92.8%) from others were requested unnecessarily.

Conclusion: To decrease these unnecessary requests, relevant clinics should be informed about this misuse of related tests. This test can be restricted by Hospital Information System and reflex testing could be employed in the scope of the "Rational Laboratory Usage" program of the Ministry of Health.

Keywords : "free psa", "rational use of laboratory tests"

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-118

Abstract Reference : 48

The Effect Of Preanalytical Changes On Erythrocyte Sedimentation Rate

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Aim: It is known that some laboratory tests show diurnal variation and are affected by fasting-satiety status. There are limited literature on the diurnal variation and postprandial status of erythrocyte sedimentation rate (ESR). In this study, we want to investigate these preanalytic factors on ESR.

Materials and Methods: Blood samples were taken from 12 volunteers (8M, 4F) between 18-50 years of age into ESR tubes at 09:00, 10:00, 11:00, 12:00, 15:00, 18:00 and 24:00 hours. ESR was studied by the Westergren method. The samples taken at 09:00 were accepted as basal which is compared with the other time intervals. Statistical analyzes were performed in the SPSS 15.0 program and Bonferroni correction was performed to determine significance limits ($p < 0.0125$ for diurnal variation and $p < 0.016$ for postprandial status).

Results: ESR was found to be lowest at 09.00 am [Median=5.5 mm/hour, (3.9-9.8)]. The rates at 12.00 and 24.00 were statistically higher than baseline [7.8 (4.3-11.5) and 6.6 (5.1-8.8); p values of 0.002 and 0.009, respectively]. In addition, the rates at 10.00, 11.00 and 12.00 hours for evaluation of fasting-satiety status were significantly higher than baseline level [6.2 (4.3-10.7), 6.6 (4.6-11.8) and 7.8 (4.3-11.5), p values of 0.012, 0.005, and 0.012].

Conclusion: We found that ESR had diurnal variation and was affected by the postprandial status. We concluded that these preanalytic changes of ESR should be taken into consideration in interpretation of results.

Keywords : "erythrocyte sedimentation rate", "diurnal variation", "postprandial status"

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-119

Abstract Reference : 83

Statistical Comparison of the Results on Two Same Model Biochemical Analyzers

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Aim: In laboratories with a large number of samples, more than one analyzer can be used actively in order to give patient results quickly. To ensure patient safety, the results should be comparable and there should be no clinically significant difference due to the analytical system used. For this reason, laboratories should determine the acceptability criteria to evaluate the difference between two results objectively. While establishing acceptability criteria, total allowable error, biological variation data, standard deviation/coefficient of variation, clinical requirements, expert opinion, statistical methodology may be considered. The aim of this study was to investigate which criteria to use in assessing the significance of the difference between 2 results coming from two different analyzers of same model.

Materials and Methods: Laboratory of DEU Hospital has two Beckman Coulter AU5800 and two DXI800 analyzers. Two levels of internal quality control (IQC) are carried out twice a day and checked for

acceptability according to Westgard rules. If there is no inconvenience, patient samples are run. In this study, the approved IQC results on AU5800 and DXI800 analyzers between 01.04.2018-31.05.2018 were compared with the results of equivalent devices. The IQC results of the 23 parameters including sodium (Na), calcium (Ca), total protein (TP), potassium, glucose, total chol, creatinine, HDL chol, LDH, uric acid, urea, AST, GGT, ALT, triglyceride, total bilirubin, CK, iron (Fe) from AU5800; TSH, FT3, FT4, troponin, ferritin from DXI800 were compared according to the acceptability criteria proposed in the literature.

Criterion1: $1.7 \cdot CV_i$

Criterion2: $2.33(0.5 \cdot CV_i) + 0.250 \sqrt{(CV_i^2 + CV_g^2)}$

Criterion3: allowable total error (TEa)

Criterion4: internal control error limits recommended on guidelines of Rili-BAEK

Criterion5: external control error limits recommended on guidelines of Rili-BAEK

Results: Criteria 1 and 2 were derived based on biological variation data and their values were close to each other except for GGT, troponin and Fe. When they were applied, number of results with a significant difference was less than 5% in all tests except Na, Ca, FT3 and FT4 in low level control. TP and ferritin were added to these tests in high level control.

TEa values was 20-30% lower than the criteria 1 and 2 in all tests except troponin. When this criterion was applied, there was a significant difference in over 5% of the results of Na, Ca, glucose, FT3 and FT4 in both level controls. The ratio has reached 25% in FT3, FT4.

When criterion 4 was applied, number of results with a significant difference over 5% were determined in Na, FT3, FT4, LDH, uric acid, ferritin, urea and troponin at both level controls.

When criterion 5 was used, none of the tests had results with significant difference exceeding 5% of the total number of compared results, and for most of the parameters this ratio was zero.

Conclusion: Numerous results with significant difference would increase workload in the routine work; too few results would lead to unrealistic comparisons. For these reasons, we decided to use criterion 5, in Na, Ca, FT3 and FT4 after evaluating the method performance by using "relative root mean square of the error of measurement" and use criteria 1 or 2 in the other tests.

Keywords : acceptability criteria; biological variation; total allowable error; laboratory errors.

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-120

Abstract Reference : 107

Avoiding The Unnecessary Thyroid Tests Requests By Using Population Based Data

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Aim: TSH is the initial test for the evaluation of thyroid disorders. Free thyroxine (fT4) should be measured in the setting of TSH value which is out of reference interval. However most laboratories use reference intervals of assay kit and that means many inappropriate test requests of fT4. In our study we aimed to determine a new reflexing cutpoint different from kit based value.

Material and Methods: In our study, data set obtained from the database of Ankara University Cebeci Hospital laboratory. This data set include 12.240 TSH and fT4 test results measured by ADVIA Centaur

XP (Siemens Diagnostics, Tarrytown, NY). TSH and fT4 results imported to MedCalc for Windows, version 15.0 (MedCalc Software, Ostend, Belgium). A ROC curve was generated for the new low TSH cutpoint for reflexing fT4 test.

Results: 94.1 % (11.517) of 12.240 fT4 results were in reference intervals (11.5-22.7 pmol/L), on the other side 84.6 % (9.747) of these 11.517 TSH results were in reference intervals (0.55-4.78 mU/L). A ROC curve was done to determine TSH cutpoint for evaluating an increased FT4 and we found ≤ 0.15 mU/L of TSH value with 85.2 % sensitivity and 75.8 % specificity.

Conclusion: We recommend all laboratory professionals to evaluate their low TSH cutpoint for reflexing fT4 test to avoid unnecessary thyroid test utilization.

Keywords : Thyroid tests, Diagnosis and Laboratory examinations

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-121

Abstract Reference : 121

Pre-accreditation Gap Analysis of Mongolian Laboratories

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Background: Poor laboratory quality can result in unreliable test results ultimately leading to misdiagnosis, inappropriate treatment and may even be potentially life threatening. To demonstrate the quality and reliability of their services, medical laboratories seek accreditation to ISO 15189. There are more than 300 medical laboratories in Mongolia, and only seven are accredited so far. We have initiated a project to assist laboratories in their efforts to obtain the accreditation.

Materials and Methods: Six laboratories are selected for participation in the project. In the first phase of the project, a gap analysis of the participant laboratories is conducted using an Excel program based on ISO 15189 requirements.

Results: The findings reveal that the participant laboratories are the strongest in Organization and management of laboratory, Quality of examination results, Personnel and facility management and in Laboratory information management. The majority of the laboratories are hospital based, and their organization and management are well established and functional mostly due to centralized administrative guidance. The concept of quality control is effectively adapted in medical laboratories, therefore ensuring the quality of examinations and the data management are usually in line with the requirements. Weaker areas include Evaluation and audits, and Document control. Even though the laboratories do conduct evaluations and control, they do not do it regularly and, most importantly, do not keep records routinely, which cause the higher gap rate.

Conclusion: Policies to meet ISO 15189 requirements are in place in the participant laboratories, but their documentation and records keeping are insufficient.

Keywords : accreditation, Mongolia, gap analysis, medical laboratories

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-122

Abstract Reference : 126

Long Term Specimen Rejection Rates in a Training and Research Hospital

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Aim: In this study, we performed a long term, detailed analysis of specimen rejection rates. The aim was to reveal the main causes and sites of rejection in order to take effective preventive measures, other than the routine preanalytical quality educations.

Materials and Methods: The rejected specimens in four-year period (April 2014-Mars 2018) were investigated retrospectively. Rejection rates were analysed with regard to rejection cause (ordering and labeling errors, hemolysis, clotted sample, insufficient sample, inappropriate blood-anticoagulant ratio) sample collection site (central and emergency laboratory) and specimen type (routine biochemistry-hormone, hemogram, coagulation, HbA1c, blood gases, urine).

Results: During the four-year period, in a total number of 7.168.438 specimen 108.623 were rejected. The most common causes were hemolysis, clot and insufficient sample (respectively %33.12, 25.51 and 17.10 of total rejected samples). Blood gases specimens were the most rejected samples with a rate of %5.03; they were followed by coagulation and biochemistry-hormon groups (rejection rates %1.66 and 1.54 respectively).

Despite its lower specimen size, rejection rate was far more elevated in emergency department (%65.77 of total rejected samples) than the central laboratory. In emergency laboratory, the most rejected specimens were blood gas and biochemistry samples (rejection rates 5.03 and 4.21 respectively); the main causes were hemolysis and clot formation (%41.25 and %27.25 of total rejected samples). The rejection rate of coagulation and biochemistry-hormon specimens were the highest in central laboratory (%1.63 and %0.94 respectively); the leading cause was insufficient sample (%35.29) followed by clotted sample (%22.46).

Conclusion: The study revealed the main causes sites of specimen rejection. The detailed evaluation showed that blood gases samples in emergency department and hemolysed samples in both emergency and central laboratory needed special interest in order to reduce the rejection rates.

Keywords : Quality, preanalytical variables, specimen rejection

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-124

Abstract Reference : 152

Laboratory Medicine: New Discipline and Textbook in the Pregradual Study of General Medicine at Slovak Medical University

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Laboratory Medicine was introduced in the pregradual study of General Medicine at Slovak Medical University in 2016/2017 by Vice Dean Katarina Holeckova. It is for the first time for Slovak republic at

all. Laboratory Medicine became a part of the education of general medicine in the 4th school year in lectures and seminars in slovak and english language. The study is closed by the exam. Lectures and seminars are based on the monography „Clinical Laboratory Science“ written and edited by Mary Louise Turgeon, issued by Elsevier and Mosby in 2012. The monography has more than 600 pages. Though the above mentioned monography was at disposal for students as a general source, the need for shorter version was strongly demanded by the students. This was prepared and worked out by prof Gustav Kovac (specialist in laboratory medicine, clinical chemistry and internal medicine) and Anna Porubenova (specialist in laboratory medicine and for organisation of the health care): both accountable for running lectures and seminars in this new pregradual discipline. The issue of medicine was reviewed, complemented and adjusted by Katarina Holeckova PhD (specialist in pediatrics and infectology), Katarina Cerna (specialist in internal medicine, diabetology and social medicine) and Beata Havelkova (specialist in internal medicine and for health insurance). The issue of laboratory was reviewed, complemented and adjusted by Pavel Blazicek (specialist in laboratory medicine and clinical chemistry), Monika Drakulova (specialist in hematology, laboratory medicine and pediatrics), Michal Farkas (specialist in laboratory medicine and clinical chemistry), Anna Keleova (specialist in clinical immunology and allergology), Daniel Kuba (specialist in clinical immunology and alergology), Michal Ondrejcek (specialist in clinical genetics, obstetrics and gynaecology), Jan Trupl CSc (specialist in clinical microbiology). In comparison with „Clinical Laboratory Science“ edited by Mary Louise Turgeon which we consider as the main source for our students and as a base, this document is shorter (the text includes 160 pages and 22 chapters), in general hierarchy as well as in some chapters restructured and complemented, in global architecture other priorities have been set. The main goal is to offer targeted comments to the lectures: the document could be considered as an extended syllabus as well. We strongly recommend to use it as a supportive tool helping „to keep the line and orientation“ in the process of the study of other textbooks and monographies. At Slovak Medical University up to 2016 did not exist a discipline explaining to medical students systematically what is clinical laboratory and how it can be used effectively. Slovakia has very strong monovalent history in laboratory diagnostics. We consider the implementation of a new polyvalent discipline laboratory medicine in the structure and process of undergraduate education under given conditions as a breakthrough and success.

Keywords : Laboratory Medicine New Discipline Pregradual Study General Medicine Textbook

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-125

Abstract Reference : 168

Diurnal Variation Of 21 Commonly Used Routine Biochemical Tests

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Objective: Commonly used routine biochemical tests can be requested at any time of the day. There could be some variations at these different time intervals in a day. In order to make a correct and reliable decision on the diagnosis and follow-up of patients, the clinical significance of these variations should be known.

Materials and Methods: Blood samples were taken from 17 healthy volunteers (11 males, 6 females) between the ages of 18-50 at 09.00, 10.00, 11.00, 12.00, 15.00, 18.00 and 24.00 hours. Volunteers' blood was taken at 09.00, 12.00 and 18.00 hours before breakfast, lunch and dinner. The samples taken at 09.00 were accepted as basal. The results of 21 biochemical tests in blood samples obtained at 10.00, 11.00, 12.00, 15.00, 18.00 and 24.00 were statistically and clinically compared with the results at 09.00.

Findings: There was no clinically significant difference in creatinine, alanine transaminase, aspartate transaminase, gamma glutamyl transferase and alkaline phosphatase concentrations during the day. Glucose, blood urea nitrogen, uric acid, total protein, albumin, total bilirubin, direct bilirubin, sodium, potassium, chlorine, amylase, iron, unsaturated iron binding capacity, total cholesterol, high density lipoprotein cholesterol and triglyceride showed clinically significant variations. Especially, blood urea nitrogen levels has a variation up to 20-30%, total bilirubin, direct bilirubin, triglyceride and iron levels up to 40-50% within the day.

Conclusion: According to our study, the blood urea nitrogen, total bilirubin, direct bilirubin, triglyceride and iron concentrations has a significant variation within day and results of these tests should be interpreted according to these variations.

Keywords : Diurnal rhythm, fasting, postprandial period, biochemical tests

Hematology – Oncology

Status : Accepted - Poster Presentation

P-126

Abstract Reference : 350

Unnecessary Laboratory Test Requesting For The Diagnosis Of Iron Deficiency Anemia And Cost Effectivity

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Aim: Laboratory workload is increasing a lot nowadays. There are many reasons for this situation, but unnecessary test requesting has also significant effect. In our study, the unnecessary demand and the additional cost of the tests performed in the iron deficiency anemia were discussed through the anemia approach algorithm.

Materials and Methods: We retrospectively investigated patients who applied to our hospital, studied complete blood count (CBC) and iron parameters [serum iron (Fe), total iron-binding capacity (TIBC) and ferritin] simultaneously between 01.05.2017 and 01.06.2017. When the data were obtained; pregnancy, child and nephrology cases were excluded. Patients were divided into four groups; the first group had hemoglobin and iron parameters within the normal range, the second group had hemoglobin within normal range but iron levels were under the reference interval, the third group had hemoglobin under the reference interval but the iron parameters were within the normal range, the fourth group had both low hemoglobin and iron levels. The first group was described as unnecessary test requesting for the iron deficiency, the second group was described as the iron deficiency in the pre-latent or latent stage, the third group was the anemia due to other causes except iron deficiency and the fourth group was described as the clear iron deficiency anemia.

Results: A total of 566 cases were studied in which CBC and iron parameters were studied simultaneously. These cases were divided into four groups. In the first group, hemoglobin and iron levels were in the reference range and 301 (%53,1) cases were evaluated as unnecessary test requesting group. In the second group hemoglobin was within the normal range but the iron parameters were abnormal according to the reference interval, a total of 104 (%18,3) cases were present. The third group hemoglobin levels were under the reference interval and iron parameters were within the normal range, a total of 45 (%7,9) cases present. The fourth group hemoglobin and iron parameters were both abnormal, a total of 116 (%20,1) cases were present. According to the current prices of Health Communication Application; Fe: 1.21 TL (0,22 EUR), TIBC: 1.21 TL (0,22 EUR), Ferritin is 5.5 TL (1,01 EUR). A total payment of 7.92 TL (1,45 EUR) has been made for a single patient. The additional cost, which is paid for 301 patients in a month, is 2.383.92 TL (445,38 EUR).

Conclusion: The unnecessary test requesting may take place when the clinician is worried about the missing true diagnosis or when the patient have complicated clinical situation. If the number of requesting testing increases, the likelihood of test may be out of the normal reference range will also increase. For this reason, it is important that the clinician and the laboratory specialists have to prepare algorithms together and follow them. Especially reflex and reflective testing which can be applied in certain situation can be useful.

Keywords : Unnecessary test requesting, iron deficiency anemia, cost effectivity

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-127

Abstract Reference : 179

Comparing Diagon and Mindray Trademark Reactives' Results of MINDRAY BC 6800 Hematology Analyzer

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Aim: We aimed to compare Diagon and Mindray Trademark Reactives in MINDRAY BC 6800 Hematology Analyzer. In our study, correlation and bias between these two reactives were investigated and results were evaluated in terms of accuracy and precision.

Materials and Methods: Mindray and Diagon reactives were compared by using MINDRAY BC 6800 Hematology Analyzer at the same day. Three level "Diagon" control materials were used as internal quality control materials. By using Diagon reactives, three level internal quality control samples were analyzed ten times for pesicion. Right after, randomly chosen 50 patients' samples were analyzed. Reactives were changed to Mindray reactives and after that calibration and quality control processes were done. Three level internal quality control samples were run for ten times again. Finally, randomly chosen same 50 patients' samples were analyzed with this reactives.

CV% values were determined by using internal quality control results. Means of internal quality control analysis by using Diagon reactives were accepted as reference for calculating BIAS% [(reference mean/calculated mean)/reference mean*100=BIAS%]. (TEa)=1.65x(CV%)+BIAS% formula was used to calculate total allowable error with 95% confidence interval (1,3). By using this formula, TEa values for three levels were determined. Results of fifty patients obtained from both reactives were compared by using Pearson correlation analysis.

Results: Desirable total allowable error limits according to Westgard QC (2) were $\pm 4.19\%$ for Hgb, $\pm 15.49\%$ for WBC, $\pm 16.8\%$ for RBC, $\pm 2.42\%$ for MCV and $\pm 13.4\%$ for PLT. TEa values derived from our data for high internal quality control serum were $\pm 2.4\%$ for Hgb, $\pm 4.23\%$ for WBC, 3.93% for RBC, $\pm 0.94\%$ for MCV and $\pm 5.26\%$ for PLT; for normal internal quality control serum $\pm 2.8\%$ for Hgb, $\pm 4.64\%$ for WBC, 1.13% for RBC, $\pm 1.03\%$ for MCV and $\pm 5.33\%$ for PLT; and finally for low internal quality control serum $\pm 2.43\%$ for Hgb, $\pm 4.66\%$ for WBC, 1.99% for RBC, $\pm 1.36\%$ for MCV and $\pm 6.2\%$ for PLT. These values were below the total allowable error limits.

Fifty patient samples' results obtained from analysis both with Mindray and Diagon reactive were highly correlated (For Hgb $r=0.999$; WBC $r=0.997$;RBC $r=0.997$; MCV $r=0.999$; PLT $r=0.993$, respectively).

Conclusion: In this study, by using internal quality control serum, Mindray and Diagon reactives' Hgb, MCV, RBC, WBC and PLT parameters were evaluated for their accuracy and precision. For all tests, TEa values from our study were found to be below the proposed ratios. Additionally, patient samples

analyzed with both two different reactives were shown to be well correlated. These results indicated that hemogram analysis by using Mindray and Diagon reactives in Mindray BC6800 analyzer were compatible.

Keywords : Total allowable error, Mindray, Diagon, Correlation

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-128

Abstract Reference : 430

Internal Quality Control Interval Identification Study for Intraoperative Parathormone Testing

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Aim: Primary hyperparathyroidism is a disease caused by the direct pathology of parathyroid hormone (PTH) overexpression that affects one or more of the parathyroid glands, and the etiology is generally unknown. Primer hyperparathyroidism manifests itself in three forms; adenomas, hyperplasia and cancer. The most common cause is adenoma with 90%. Rapid PTH test is performed in peripheral blood sample in the fast PTH mode of autoanalyser, after 10 to 15 minutes of parathyroidectomy during parathyroid adenoma surgery. If the obtained PTH value is reduced more than half of the preoperative value, it is considered as a significant finding indicating that the removed patch is the pathological gland. The aim of this study was to define the reference interval to Beckman Coulter DXI-800 autoanalysers for intraoperative PTH testing.

Material and Method: The Sero Autonom Immunassay control material used in Beckman Coulter DXI-800 does not have a defined reference range for intraoperative rapid PTH testing. Bio-Rad Liquicheck Specialty Immunassay control materials level 1 and level 2 (Lot Number: 60220) and Sero Autonom Immunassay control materials level 1 and level 2 (Lot Number: 1608805-1609806, respectively) were measured for 2 months on two different Beckman Coulter DXI-800 autoanalyzers. The averages, the coefficient of variation and the standard deviations of the repeated measurement results on both devices were calculated.

Results: The mean, standard deviation and coefficient of variations for Bio-Rad Liquicheck Specialty Immunassay control Level 1 and Level 2 were 18.6, 1.78, 9.6 and 157.7, 8.6, 5.4, respectively. The same parameters stated in the Bio-Rad insert were 20.6, 1.8, 8.2 and 179.6, 15.7, 7.3, respectively. When the Bio-Rad control range was defined to the device, the measured values were within ± 2 SD. The mean, standard deviation and coefficient of variations for Sero Autonom Immunassay control Level 1 and Level 2 were 20.2, 2.3, 11.5 and 107.4, 11, 10.2, respectively.

Conclusion: The values measured in the Bio-Rad material was consistent with expected values. In conclusion, it was decided that the values of Sero control material were suitable for intraoperative rapid PTH study and it was decided to use the measured values in defining the internal quality control reference intervals for intraoperative rapid PTH test in Beckman Coulter DXI-800 autoanalyzers.

Keywords : Keywords : intraoperative parathormone, internal quality control, IOPTH

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-129

Abstract Reference : 208

Alert Revision Of Critical Values At The Emergency Laboratory.

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Aim: The results obtained in the emergency laboratory that require urgent action are the parameters called critical values, which may indicate an alarming and potentially lethal situation. The clinical analyst must communicate the critical values to the medical doctors by telephone and registering it in the computer program according to protocol.

The aim is to analyze what were the most frequent parameters that have been warned during the last two months at our emergency laboratory.

Material and Methods: The study was carried out from April 2018 to May 2018, the laboratory data base was used and the total number and percentage of notifications were calculated according to the parameter. The average age of the patients was 76 years with an age range between 0 and 95 years.

The following critical values were established for each parameter: Alanine aminotransferase (ALT): >1000 U/L; Calcium: <6 or >13 mg/dL; Creatinine: >7,4 mg/dL; Digoxin: >4ng/ml; Glucose: <45 or >500 mg/dL; Haemoglobin: <6 g/dL, International normalized ratio (INR): >7; pH: <7.20 or >7.60; Platelets: <30000/mcl; Potassium: <2.6 or >6.5 mEq/L; Sodium: <120 or >160 mEq/L; Total Bilirubin: >15 mg/dL and Urea: >250 mg/dL.

Results: A total of 237 alarms of critical values were recorded and reported to the physician. In regard to our results, the percentage of alerts per parameter:

Potassium: 19.41% (60.87% low values and 39.17% high values); Haemoglobin: 19.41% (low values); Glucose: 17.72% (38.10% low values and 61.90% high values); pH: 16.03% (73.32% low values and 23.68% high values); Sodium: 9.28% (45.45% low values and 54.55% high values); INR: 5.91% (high values); Creatinine: 4.64% (high values); Calcium: 3.38% (37.50% low values and 62.50 high values); Platelets: 1.27% (low values); Urea: 1.27% (high values); ALT: 0.84% (high values); Total Bilirubin: 0.42% (high value) and Digoxin: 0.42% (high value).

Conclusion: The four most frequently reported critical values were Potassium, Haemoglobin, Glucose and pH. Most of the Glucose reports were due to high values, however in the case of potassium and pH were due to low values.

The establishment of a protocol for immediate notification of critical values is essential for a rapid action by the physician.

The registration of critical values alerts is also important for the process because they are measurable and allow to implement improvement strategies if necessary.

Keywords : Critical, values, emergency, laboratory, protocol.

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-130

Abstract Reference : 243

A Preliminary Work For The Standardization Of The Rejection Criteria Of Coagulation Examples In Our Laboratory

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Aim: The coagulation parameters were measured by the tubes containing 9:1 anticoagulant substance (citrate). The whole blood should be mixed with enough citrate to have the total plasma and to do measurements more accurately. Therefore, samples should be taken right amount level shown on the tube, and it should be turned upside down gently without hemolysis. In this study, we aim to detect the effects of insufficient and hemolyzed samples on coagulation parameters and to determine their roles on clinical-based decisions. Additionally, we also target to standardize and to raise awareness for the rejection criteria of samples.

Materials and Methods: In our study, blood samples were provided from 30 volunteer patients at the same time, and each sample were divided into two different coagulation tubes. For the further analysis, the first tube contained enough blood samples according to citrate level(control), however, in the second tubes, blood samples were one centimeter lower than the normal level. We analyzed both tubes in the ACL TOP 700 (Beckman Coulter, ABD) equipment for PT and APTT parameters. Then, in the first tubes, the blood samples were mechanically hemolyzed with the help of injector, and the same analysis for the hemolyzed samples was conducted as it is mentioned above. We transferred the data to SPSS 25.0 package program, and the groups were compared by Paired t test, Pearson correlation analyses method.

Results: We obtained PT and APTT measurements from control, insufficient and hemolyzed plasma samples. PT values of normal group are statistically higher than insufficient group. Respectively; 11.73 ± 0.64 , 11.55 ± 0.65 sn ($p=0,001$). The APTT values are statistically higher in the insufficient sample group. 29.77 ± 2.06 sn in normal group, 32.13 ± 2.66 sn in insufficient samples group ($p<0,001$). Normal group PT values were statistically lower than hemolysis group. Respectively; 11.73 ± 0.64 , 12.31 ± 0.85 sn ($p<0,001$). APTT values were statistically higher in the hemolysed group. 29.77 ± 2.06 sn in normal group, 32.87 ± 2.37 sn in hemolysed group ($p<0,001$).

Conclusion: We saw statistically significant differences between insufficient and control plasma samples in PT analysis, we detected significant statistical differences in APTT analysis. There was a statistically significant difference in haemolysed samples. Although the differences for PT are statistically significant, their clinical significance should be assessed. But it seems to be appropriate for the APTT to cancel in hemolytic and insufficient samples as in our study.

Keywords : Coagulation, Insufficient Samples, Hemolyzed Samples

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-131

Abstract Reference : 254

Publication Rates Of The Scientific Presentations At The National Turkish Clinical Biochemistry Congresses In 2013, 2014 And 2015.

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Aim: The aim of the present study was to evaluate the publication rates of the scientific presentations at the national Turkish Clinical Biochemistry Congresses in 2013, 2014 and 2015.

Method: All scientific presentations at the National Turkish Clinical Biochemistry Congresses in 2013-2015 were included in the study. The electronic search engines PubMed and Google Scholar were used to determine whether a presentation was published as a full text article. Times from presentation to publication were also recorded.

Results: Publication rate of a total of 412 scientific presentations was 23.1 % (95). It was higher for oral presentations (30.8 %) when compared to poster presentations (22 %), however this difference was not statistically significant ($p=0.302$). Publication rates were 24.6, 29.0 and 16.4 % for presentations at annual meetings in 2013, 2014 and 2015, respectively. The differences between publication rates of scientific presentations in different years were also not statistically significant ($p=0.053$). Mean time from the meeting to publication was 14.5 ± 13.5 months. 86 out of 93 scientific presentations (92.47 %) were published within 3 years after the meetings.

Conclusion: The publication rates of the scientific presentations at Turkish national congresses of different medical sciences vary between 4.7 % and 57 % according to literature. Our results show that the publication rate of scientific presentations at the National Turkish Clinical Biochemistry Congresses is relatively high, which can be accepted as an indicator of high scientific quality of the meetings.

Keywords : scientific presentations, publication rate, national Turkish clinical biochemistry congress

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

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Abstract Reference : 255

A Verification Study Of A New Blood Collection Tube To Be Used For Emergency Testing

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Aim: The emergency departments (EDs) of the hospitals need short turnaround times for critical Clinical Biochemistry tests. A new lithium heparin blood tube from Becton-Dickinson, the Vacutainer® Barricor™ (Barricor) requires no clotting time and only a 3 minute spin time. Comparing emergency (STAT) test parameters of the samples collected in two different tubes, we aimed to evaluate whether the Barricor tubes had acceptable performance with a verification study before to use in our laboratory.

Materials and Methods: Blood was collected into Becton Dickinson Vacutainer® Rapid Serum Tubes (RSTs) and Barricor Plasma Blood Collection tubes under at the same preanalytical conditions from 63 adult subjects who had chest pain seen in ED. RSTs were used as comparative. Plasma samples were processed in tandem with the serum samples. The plasma results were not reported to ED. 16 analytes

using in emergency laboratory were measured. All specimens were analyzed on Roche Cobas e411 immuno analyzer and Cobas c501 biochemical autoanalyzer using the original reagents. We evaluated the analytes' trueness with systematic errors (SEs) obtained from linear-regression statistics by substitution X_c , the decision-level concentrations, for the predictor variables (x_i) in the equations. The standard error of the estimate ($S_{y,x}$) values were used in 'random error' determination. As a clinical acceptance criterion, total allowable error (TE_A) values were used from Clinical Laboratory Improvement Amendment (CLIA). If the SE value determined for the test was found lower than TE_A , it was assumed that the tube had acceptable performance. In addition, $S_{y,x}$ values was also compared to TE_A values.

Results : There was statistically no significant differences ($p>0.05$) between RST and Barricor groups according to paired-sample T test results for glucose, urea, creatinine, alanine aminotransferase, creatine kinase, lactate dehydrogenase, amylase, high sensitivity troponin T (hs-TnT), and creatine kinase-MB mass, while there were statistically significant differences ($p<0.05$) for aspartate aminotransferase, total bilirubine, direct bilirubine, calcium, sodium, potassium, and chloride. SE values were lower than TE_A values for all analytes. As for $S_{y,x}$ values were found lower than the TE_A values for all parameters except hs-TnT. However, after outliers were singled out using Horn's algorithm from hs-TnT data set (≥ 53 ng/L, $N_{\text{outliers}} = 13$), $S_{y,x}$ value was also lower than the TE_A value.

Conclusion: Clinical acceptance criteria are used to determine if the performance of a tube is acceptable for use in a clinical setting. Although there were statistically significant differences, since SE and $S_{y,x}$ values were lower than TE_A values for all assessed tests, Barricor tubes had acceptable performance. Using Barricor blood collection tubes having short interval of centrifugation and requiring no clotting time gives advantages to improve the turnaround time. One of the important criterions in preventing of preanalytical errors is verification of new blood collecting tubes before begin to use in the laboratory.

Keywords : Blood collection tubes, verification

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-133

Abstract Reference : 261

Reference Range And Method Comparison Study With New Roche Folate Assay

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¹Centro Laboratories

BACKGROUND: Raising evidence about folate and Vitamin B12 vitamins in public health has put more emphasize on laboratory handling of these nutrients. The aim of this study was to establish reference range for a newly developed Roche Folate assay and compare it with widely used two others; Beckman and Abbott.

METHODS: 133 patient samples (58 men, 75 women; age range 11-82 years) with normal levels of Vit B12, homocysteine, RBC and Hb were included in the study. Blood sampling and storage procedures were done according to manufacturer instructions and measurements were performed on the same day. Roche kit (cat. no:07559992190) analysis was performed on Hitachi Modular E-170, Beckman kit (cat no:A98032) on Unicel DXI 600 and Abbott kit (cat no:1P74-25) on Architect Plus i2000 analysers. Multiple group were compared by ANOVA. Reference ranges were calculated according to CLSI C28-A3 non-parametric percentile method; method comparisons were done by use of Bland Altman, Passing Bablock and Concordance Correlation statistics on MedCalc (version 18.2.1) licensed program. Roche folate reference range given in the kit was 3.89-26.8 ng/mL.

RESULTS: Mean age of patients was 51.1 (SD:13.9) years. Men and women groups were age matched ($p=0.232$) and no significant difference was observed between genders ($p=0.797$). The whole group was divided into 4 subgroups as <20, 20-40, 40-60 and >60 years of age and no significant difference was found ($p=0.441$). Reference intervals for Roche was 2.21 – 20.66, Beckman 3.56 – 26.66 and Abbott 2.57 – 16.20 ng/mL ($p<0.0001$). Percent difference (limits of agreement) between Roche and Beckman was -12.9 (-40.6 – 14.8), Roche and Abbott 12.9 (- 7.7 – 33.4), Abbott and Beckman -25.7 (-49.2 - -2.2). Roche vs Beckman assays showed the greatest systematic difference with an intercept (CI) of $fA=0.55$ (0.042-0.91), Abbott vs Beckman showed greatest proportional difference with a slope (CI) of $B=0.759$ (0.718-0.799) and also greatest random difference with a Residual SD (1.96 SD) of 1.17 (-2.30 – 2.30). Only Roche and Beckman assays showed an acceptable agreement with a CCC (CI) of 0.93 (0.907-0.947).

CONCLUSION: Reference range of our study population was different than manufacturer's. Besides a standardization seems not yet achieved in widely used folate assays. Laboratories should be aware of performance characteristics of their method.

Keywords : REFERENCE RANGE , METHOD COMPARISON, FOLATE

Laboratory Management and Quality Control

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Abstract Reference : 367

Comparison Of Serum And Plasma For 25-Hydroxyvitamin D Measurement

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Aim: The gel in separator tubes used for separation of serum from blood cells is widely known with its interferent effects on high-performance liquid chromatography (HPLC) systems. Therefore, plasma is the recommended sample type instead of serum obtained in gel separator tubes. However, serum is the commonly used sample type for most of the biochemical test analysis. In this study, plasma and serum were compared for 25-hydroxyvitamin D [25(OH)D] measurement.

Materials and Methods: From 29 adults, venous blood samples were collected into both plastic BD Vacutainer plain tubes (Becton Dickinson and Company, BD Plymouth, PL67 BP, UK) and into BD Vacutainer plastic plasma K2 EDTA tubes (Becton Dickinson and Company, Franklin Lakes, NJ, UK) for analysis on Ultimate 3000 HPLC systems. Comparison was performed statistically by parametric paired samples t-test and mean±SD values were used to calculate the bias following analysis of the distribution by Kolmogorov Smirnov test.

Results: Comparing the concentrations of 25(OH)D in both sample types, no significant differences were calculated ($p=0.071$). The bias was calculated as 2.56%. There was a positive strong correlation ($r=0.994$, $p<0.001$) between two variables.

Conclusion: Both serum collected into vacutainer tube without gel separator and plasma obtained from the tube with EDTA can be used interchangeably for 25(OH)D concentration determination with HPLC systems.

Keywords : evaluation, plasma, serum, 25-Hydroxyvitamin D

Laboratory Management and Quality Control

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Abstract Reference : 282

Unavoidable Problem; Specimen Rejection in a Core Laboratory Setting

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Aim: Preanalytical process is defined as the time between the test request and arrival of the specimens to the laboratory. Preanalytical process errors account for about 60% of the problems that arise in laboratory results. In this study, we aimed to evaluate the preanalytical problems through the analysis of rejected samples.

Material and Methods: Sample rejection causes were obtained from the laboratory information system retrospectively from January 2017 to December 2017 in Manisa Celal Bayar University Hafsa Sultan Hospital Core Laboratory Setting. The rejection causes were evaluated statistically according to the laboratory units and the department from which the sample came from.

Results: 15,228 samples (1.50%) were rejected among 1,010,569 samples arrived to our laboratory. Rejection causes for the samples starting from the most frequent were inadequate samples (41.2%), clotted samples (29.6%), hemolyzed samples (18.7%), inappropriate test requests (5.6%), and inappropriate tubes (3.9%).

When rejected samples were examined on a department-by-sample basis, it was seen that the samples which were rejected most frequently were from inpatient clinics (51.5%), intensive care units (23.3%), emergency rooms (15.2%), adult outpatient clinics (6.5%) and child outpatient clinics (3.5%).

A statistically significant difference was found between the departments in terms of rejection causes by chi-square statistical analysis ($p < 0.05$). Inadequate sample collection at the inpatient clinics and outpatient clinics was remarkable, while hemolytic and inadequate samples were found to be important rejection causes in the emergency rooms. The most common rejection causes of the samples which came from intensive care units were clotted and inadequate samples.

A statistically significant difference was found between rejection causes in terms of the laboratory units ($p < 0.05$). In the coagulation unit, inadequate sample (71.6%) was the most common cause of rejection. The most common causes in the biochemistry-hormone unit were hemolyzed (52.1%) and inadequate samples (22.3%). In the hematology unit, the most common cause for rejection was clotted sample (79.5%). It is noteworthy that, for blood gas unit whose results are critical for emergency rooms and intensive care units, the most frequent cause for rejection was clotted specimen (83.3%). For sedimentation unit, inadequate sample (41.2%) was the most common cause of rejection.

Conclusions: Among rejected samples, inadequate samples from inpatient clinics were the number one cause (24.6%). In order to reduce our total rejection ratio (1.50%); periodic trainings were given to staff about blood sample collection, and the importance of preanalytical process.

Keywords : rejection analysis, preanalytical process, inpatient clinics, inadequate sample

Laboratory Management and Quality Control

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Abstract Reference : 284

Sample Rejection Rates and Causes in a Clinical Laboratory Settings: Patient Safety

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Aim: One of the pre-analytical errors is sample rejection. It negatively affects patient safety. In this study, we aimed to evaluate sample rejection rates and the types of preanalytical errors in different collection areas in a university core laboratory.

Material and Methods: Sample rejection data in Manisa Celal Bayar University Hafsa Sultan Hospital Core Laboratory were obtained retrospectively from the laboratory information system and analyzed for frequency, cause and departments for the year 2017. Rejection causes were classified as clotted sample, inadequate sample, hemolyzed sample, inappropriate request, inappropriate tube and lipemic sample. Departments were categorized into five groups: Emergency rooms, Inpatient clinics, intensive care units (ICU), adult outpatient clinics, pediatric outpatient clinics. Sample rejection ratios were calculated by Microsoft Excel.

Results: Of the 393.185 received complete blood count (CBC), blood gas (BG), coagulation (COAG) specimens, 10026 (2.54%) were rejected.

Total specimen rejection ratios for CBC, BG, and COAG were 0.91%, 3.1% and 6.74% respectively.

The most common rejection causes from emergency departments for CBC specimens (n=268) were clotted samples, (n=180, 67.2%) and inadequate samples (n=62, 23.1%); for BG specimens (n=337) were clotted samples, (n=270, 80.1%) and inadequate samples (n=52, 15.4%); for COAG specimens (n=600) were inadequate samples (n=290, 48.3%) and hemolyzed samples (n=163, 27.2%).

The most common rejection causes from inpatient clinics for CBC specimens (n=1208) were clotted samples, (n=968, 80.1%) and inadequate samples (n=117, 9.7%); for BG specimens (n=755) were clotted samples (n=611, 80.9%) and inadequate samples (n=124, 16.4%); for COAG specimens (n=3465) were inadequate samples (n=2669, 77%) and hemolyzed samples (n=343, 9.9%). The most common rejection causes from ICU for CBC specimens (n=412) were clotted samples (n=367, 89.1%) and inadequate samples (n=21, 5.1%); for BG specimens (n=800) were clotted samples (n=697, 87.1%) and inadequate samples (n=79, 9.9%); for COAG specimens (n=1375) were inadequate samples (n=952, 69.2%) and clotted samples (n=202, 14.7%). The most common rejection causes from adult outpatient clinics for CBC specimens (n=166) were clotted samples (n=119, 71.7%) and inappropriate tube (n=19, 11.4%); for BG specimens (n=80) were clotted samples (n=65, 81.3%) and inadequate samples (n=13, 16.3%); for COAG specimens (n=366) were inadequate samples (n=265, 72.4%) and hemolyzed samples (n=40, 10.9%).

The most common rejection causes from pediatric outpatient clinics for CBC specimens (n=137) were clotted samples (n=107, 78.1%) and inadequate samples (n=21, 15.3%); for BG specimens (n=8) were clotted samples (n=6, 75%) and inadequate samples (n=2, 25%); for COAG specimens (n=49) were inadequate samples (n=18, 36.7%) and clotted samples (n=17, 34.7%).

Conclusions: The factors related with sample rejection may be ameliorated by training and quality assurance measures. Policies and procedures specific to specimen collection, transportation, and preparation should be rigorously followed. Periodic trainings should be given to staff about blood sample collection especially for drawing coagulation specimens.

Keywords : rejection analysis, complete blood count, blood gas, coagulation

Laboratory Management and Quality Control

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Abstract Reference : 317

The Relation of Serum Calcium Levels With Age and Month

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Objective: Since vitamin D has a seasonal variation the calcium levels might also be influenced by months. In this study we aimed to evaluate the relationship between serum calcium levels, age and months

Method: This study is a cross-sectional, retrospective study evaluating serum calcium data obtained from the biochemistry laboratory registry system of the medical faculty hospital of Akdeniz University. The patient's age, gender and month of the study were recorded from the database. The patients were divided into decades according to age. SPSS 16 was used for statistical study. Statistical significance was accepted as $p < 0.05$.

Results: 10456 (2200 male, 8436 female) patients were included in the study. The mean serum calcium level was 9.7 ± 0.47 mg/dL (male 9.73 ± 0.46 , female 9.69 ± 0.71) and the difference was statistically significant ($p < 0.05$) between male and female patients. The lowest calcium levels were in december and february, the highest were in october. The lowest calcium levels were in 4th decade (9.63 ± 0.45 mg/dL), the highest were in 6th decade (9.76 ± 0.47 mg/dL).

Conclusion: This study showed influence of months variation on serum calcium levels

Keywords : Calcium, age, month

Laboratory Management and Quality Control

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Abstract Reference : 332

Assessment Of The Interferences Caused By Hemolysis In The Determination Of Biochemical Parameters: Initial Study

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INTRODUCTION: Interferences are an important source of variability in analytical procedures. One of the most common is the interference produced by hemoglobin, which is mainly related to in vitro processes due to incorrect collection or transport of samples. This interference may cause an increase or decrease in the results of some parameters and this alteration may become clinically relevant. Therefore, it is necessary to establish protocols when working with hemolysed samples and to report the results to the clinician.

OBJECTIVES: To study the influence of hemolysis in the measurement of 10 biochemical parameters and to establish decision values to inform the existence of limitations in the assessment of the results.

MATERIALS AND METHODS: A hemolysate of erythrocytes was prepared by osmotic disruption, according to the Meites procedure, and was added to several aliquots of a pool of patient sera to obtain increasing concentrations of hemoglobin (hemolysis 0-1000). All aliquots were performed in duplicate. The determination of the biochemical parameters and the hemolysis indexes in each of the initial aliquots

and the hemolysed ones were carried out in cobas c701 and e602 analyzers (Roche Diagnostics, Switzerland).

RESULTS: The table shows the significant hemolysis values for each parameter according to the manufacturer's insert. In addition, the relative percentages of deviation of the concentration of each parameter are presented with respect to the initial value for the different grades of hemolysis evaluated. Bold indicates the value from which the desirable analytical quality specifications are exceeded. Positive interferences are observed in lactate dehydrogenase (LDH), folate, aspartate aminotransferase (AST), creatine kinase (CK), potassium and alanine aminotransferase (ALT); negative interference in direct bilirubin (BD), alkaline phosphatase (ALP) and gamma-glutamyltransferase (GGT); no interferences in proteins are observed.

CONCLUSIONS: In view of the results, we can verify that the significant values of hemolysis established in the insert of the manufacturer of the analyzer correspond mostly to the interferences observed in this study. Therefore, they can be used to create computer rules in the Laboratory Information System (SIL) that indicate to the clinician the existence of limitations in the assessment of the analytical results. In addition, it would be necessary to continue the study to specify the clinical relevance of these interferences.

Keywords : Hemolysis, significant, value, rules,

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Abstract Reference : 17

Adapting New Lots Of Controls: Intermediate Precision Including Four Instruments

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Aim: We aimed to share our experience of adapting new lots of the immunoassay control materials confidently via four instruments of the same model (DxI800, Beckman Coulter Inc., USA).

Materials and Methods: First we achieved (April 2017) serial test results of the new lots of internal quality control materials showing difference in lots of calibrator and reagent, although the product was in use eight months later. We got all the test results of a vial via all the four instruments simultaneously (December 2017); preparing a new vial each day, we showed analytical variations sourced from instruments and calibrations during three days. For each test parameter, we daily picked up the possible mean value when the coefficient of variation (CV) of the four instruments was less than 7%. Comparing the achieved mean values (of the three days, independently) with figures proposed in the inserts, we set up the values of the mean and the standard deviation (SD) for the new lots of control materials, in 2 different levels. When the difference between the two figures was less than 5%, we preferred the figure established in the insert for each level.

Results: Sixteen of the 29 mean values in level-1, and 18 of the 29 mean values in level-2 altered, and the figures risen from the instruments were accepted as valid mean values. According to the CV value of the analyte, we multiplied the SD by 1.5, 2.0 or 3.0 in order to find acceptable interval for the internal quality control process. The previous data (April 2017) was also within the valid intervals. In the following four months, reproducibility was monitored and confirmed by acceptable scores of the external quality control programme.

Conclusion: By using four instruments of the same model in the same laboratory, fast determining the acceptable limits for the new lots can be confident and time consuming.

Keywords : analytical variation, immunoassay, laboratory medicine, total quality management.

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Abstract Reference : 26

Establishing the Reference Values of Some Biochemical Parameters in the Biology Laboratory of the UHC of Blida

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Purpose: The interpretation of biochemical analyzes results in Algeria is done for the majority of the time in comparison with reference values of European population, which do not necessarily reflect those of the Algerians, various studies carried out in France and in Ivory Coast reinforce this concept. Thus we thought to conduct this study in order to define the reference values of certain biochemical parameters in Blida's and surroundings population

Material and methods: We conducted a prospective study of a series of cases on a sample of 235 individuals of Algerian nationality, living in the region of Blida and around and presumed healthy at the biology laboratory of the university hospital center of Blida, during the period from 10/ 2016 to 06/2018.

A Selectra Pro M machine was used for the different biochemical routine assays and the statistical study was done by Excel 2013 and the Open Epi software version 3.01. Constituents were studied according to sex and age, while comparing with Western reference values.

Results and discussion: The comparison of results obtained between the man and the woman also between the adult and the child obtained revealed significant differences for several parameters studied.

In addition, it is noted the existence of significant differences between the reference values of these parameters in the Algerian subjects and the others, which could be related to the environment and food habits.

Conclusion: This study shows that each laboratory must provide its own reference values that vary with the population of a given region.

Keywords : significant differences - reference values - biochemical parameters

Laboratory Management and Quality Control

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Abstract Reference : 39

Verification Of Cardiac Markers Analysis

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Purpose: Troponin, myoglobin and CKMB-mass levels in serum are used in diagnosis of myocardial injury .Validation and verification of measurement methods are procedures that aim to establish realistic expectations with the analyst and confidence with the end user that the methods are fit for their intended purposes.

Materials and methods: All three cardiac markers were analysed on an immunoassay analyser with a sandwich chemiluminiscence immunoassay. Controls with levels chosen at two clinically relevant concentrations for each cardiac marker were assayed six times over a 6-day period on two analytical

systems. Within-run, between-run, and total CV results were compared with the manufacturer test performance results. All results were exported in to a modified and verified Excel template from ACBLM.

Results: Measurement precision and accuracy were tested. If a result did not meet the criteria, we added an additional verification step, bias calculation by CLIA or Kallner criteria. In our case, comparison between the maximum observed between-run CV and manufacturer test performance result were for troponin 6,3% (5,1%), myoglobin 2,9% (2,6%), and CKMB-mass 2,6% (2,5%). All the results were summarised in the verification plan report.

Conclusions: Verification in the medical laboratory according ISO15189 is not simple; each step must be planned in detail, documented, and reviewed. In our experience clinical laboratories are in need of generally accepted and cost-effective protocols for validation, as they are increasingly being accredited or certified according to ISO17025, ISO15189 or other similar quality systems.

Keywords: Cardiac markers, troponin, myoglobin, CKMB-mass, precision, control material, verification, validation

Acknowledgments : I would like to thank all the authors and laboratory staff who were included in the verification process. Especially I would like to thank M.Sc Petra FINDERLE for all advices and support during verification and abstract preparation.

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Abstract Reference : 46

An Example Of Compliance Between Experience And Application Of Technology

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Aim: During the laboratory testing, the most errors occur in the pre-analytical phase 50 – 75%. By introducing information system in health system, especially LABIS, work was made easier for employed staff in the laboratory, but in spite of this relief, certain percent of mistakes is unavoidable.

Material and Methods: Patient Ivan M. (male), with his doctor's order came to laboratory for scheduled control. On reception, medical worker gave him an ID number. Laboratory technician on venipuncture, took blood from patient and delivered it on further treatment. In validation procedure, specialist of medical biochemistry, who knew that Ivan M. (male) would come in laboratory, perceived that on laboratory report was written name Ivana (female). Values for certain parameters (urea, creatinine, K, Ca, P, proteins in urine ..), completely corresponded with patient Ivan M. (male), because Ivan M. (male) has very rare illness – Dent syndrome.

Results: In whole procedure, four mistakes were made in pre-analytical phase: 1. The chosen doctor wrote the wrong patient name and date of birth on the order. 2. The patient didn't check identification date on his order. 3. The medical worker in the laboratory didn't check if the patient (male) who had given order addressed to Ivana (female) was waiting an ID number for himself (Ivan-male), or for Ivana (female). 4. The laboratory worker on venipuncture checked only the surname, but not the first name of the patient.

Conclusion: Thanks to experience of a specialist who administrates validation of laboratory reports and a huge help of LABIS, enormous mistake was avoided.

Keywords : laboratory information system, experience, mistake

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Abstract Reference : 85

Unnecessary Bilirubin Test Requesting in a University Hospital

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Unnecessary Bilirubin Test Requesting in a University Hospital

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Aim: The routine use of laboratory testing has been increased in recent years. It makes rationalist test request more important. In healthy individuals, requesting bilirubin tests without jaundice clinic symptoms may be an example for this intervention. In this study, we aimed to evaluate whether bilirubin test requests were unnecessary within one month period in Pamukkale University Training and Education Hospital.

Material- Methods: In June 2018, 9629 total and direct bilirubin results from the Laboratory Information System were examined. Total bilirubin and conjugated bilirubin cut-off values assigned respectively 1 mg/dl and 0.3 mg/dl. All patients' data were evaluated with Microsoft Office 2013 packet Excel program.

Results: 9629 patients' samples were evaluated. We also divided results into two groups as total bilirubin <1 mg/dl and >1 mg/dl. We determined 8086(82.86) total bilirubin results' < 1mg/dl; in the first group, while 70610 (72.36%) conjugated bilirubin test results were < 0.3 mg/dl, 1026 (10.5%) conjugated bilirubin test results were >0.3 mg/dl. In the second group 1543 (%17.14) total bilirubin test results were > 1 mg/dl associated with 1476 (16.26%) conjugated bilirubin test results > 0.3 mg/dl.

Conclusions: We assessed only 1543(17.14%) total bilirubin and 1476 (16.26%) conjugated bilirubin test request were significant. 7060 test request was unnecessary. As a result, physicians should enter patients' provisional diagnosis into the LIS systems while ordering test requests. Without clinical icterus or jaundice symptoms, bilirubin test requests should be limited for cost-effectiveness.

Keywords : Unnecessary test, bilirubin; total bilirubin, conjugated bilirubin, test requesting

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Abstract Reference : 408

Use Of Ready Nutrient Mediums As Instrument Of Increase Economic Efficiency Of Microbiological Laboratory.

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Relevance: In the present time, laboratory diagnostics, the so-called In Vitro Diagnostics (IVD), are one of the most high-tech and dynamically developing branches of medicine. Along with such global trends in IVD as the widespread introduction of modern, high-cost diagnostic technologies into clinical practice, there is a clear-cut focus on improving the effectiveness of research, searching for indicators of the quality of the laboratory process, as well as reducing costs.

Goal: To calculate the cost of preparation of growth medium in the laboratory and compare it with the cost of commercial ready-made growth medium.

Materials and methods: The cost of preparation most popular of growth medium in a bacteriological laboratory (5% -blood agar (BA) and Müller-Hinton agar (MHA)) was calculated. Comparative analysis of the cost of ready-made growth medium was carried out. All operations on preparation and spill of nutrient mediums are carried out manually.

For a month, personnel time was measured during all stages of preparation, control of growth medium and maintenance of relevant documentation. The quality control procedure consisted of checking the germination and sterility, and for MHA- quality control of sensitivity testing to antibacterial drugs using a set of recommended control strains.

According to clinical recommendations "Intra laboratory quality control of nutrient mediums" (2014 year) calculation of costs of quality control for KA was made for clinical microbiological trials on party of 91-150 cups and included control of environments on check of growth properties and control of sterility.

Costs of quality control of the MHA include check of growth properties, control of sterility and control of statement of sensitivity to antibacterial drugs (ABP).

Results: Estimated cost of one dish of BA with bovine blood, prepared in laboratory of - 94,3 rubles, and taking into account monitoring procedure of quality – 138,68 rubles.

Estimated cost of one dish of MHA, prepared in laboratory - 73 rubles, and taking into account monitoring procedure of quality – 128,7 rubles.

The price of one dish the BA commercial environments is, on average 95,5 rubles, the MHA - 53,2 rubles

Conclusions:

1. The nutrient mediums prepared in laboratory are considerably more expensive.
2. Using ready-made growth medium can significantly reduce costs and increase economic efficiency.
3. When using ready mediums there is an economy of operating time of personnel and remission of personnel of labor-intensive manual process of preparation of mediums in large volumes.

Keywords : Microbiology, LEAN-technologies, economical production in laboratories, ready nutrient mediums, quality control

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Abstract Reference : 240

Integrated External Quality Assessment Schemes: First Experience

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BACKGROUND. ISO 15189 Standard “Medical laboratories – Requirements for quality and competence” have been widely accepted throughout the world by medical laboratories for developing quality management systems and accreditation bodies assessing their competence. It states that “interlaboratory comparison programmes chosen by the laboratory shall, as far as possible, provide clinically relevant challenges that mimic patient samples and have the effect of checking the entire examination process, including pre-examination and post-examination procedures”. ISO 15189 also requires the laboratory to develop criteria for acceptance or rejection of samples and add necessary comments to the report if the sample quality might compromise test results.

AIM OF THE STUDY. The aim of the study was to evaluate the initial results of integrated EQA schemes with particular emphasis to awareness of different professional groups of extra-analytical interferences.

METHODS. Labquality has developed the integrated external quality assessment (EQA) service – a completely new approach to external quality assessment which targets participants in both laboratories and point-of-care sites. The new schemes were launched in May 2017. First integrated EQA schemes included traditional specimens and written pre-analytical cases related to the scope of the scheme.

RESULTS. 12 different groups of laboratory professionals have been involved in the EQA rounds: experts, physicians, clinical chemists, assistants, technicians, phlebotomists, nurses, students, etc. Number of participants in each group varied significantly. It makes comparison of different groups rather difficult. Experts, nurses and phlebotomists were the best performing professionals in identification of pre-analytical errors in most cases (expected results were received from 81 to 55% of respondents respectively), while the worst performing professionals were clinical chemists, microbiologists, assistants and students (expected results were received from 16 to 31% of respondents respectively). Despite the difficulties in detection of pre-analytical errors some professional performed better in the selection of the appropriate corrective action. The best results were given by experts (81% of expected results), following by students and phlebotomists ending with assistants and quality managers (43 and 35% of expected results respectively). The best combined results have again been provided by the experts (68% of combined expected results, no totally wrong results). Only 11% of combined expected results were provided by clinical chemists. In general slightly more than half of the cases were solved in the correct way by all the participants.

CONCLUSIONS. Results clearly prove the need for more efforts to educate members of different professional groups in order to achieve better quality of extra-analytical phases in total laboratory testing. Integrated EQA schemes serve as an appropriate tool to achieve this goal.

Keywords : EQA, pre-analytical phase, integrated EQA, ISO 15189

Laboratory Management and Quality Control

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Abstract Reference : 354

Sample Rejections In Hematology Laboratory

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Aim: Preanalytical phase errors have been found at the majority of the total errors (46-68.2%) in laboratory and research medicine. These errors influence 70% of medical diagnoses. In this study, we aimed to calculate the rate of rejected specimens received in hematology laboratory stratified by area of collection and reason of rejection.

Materials and methods: Retrospective study conducted at Pamukkale University Hospitals in Denizli, Turkey, for two years period. Data on rejected hematological specimens in the laboratory information system from July 2016 to July 2018 were analyzed.

Results: Rejection ratio was 1.98% (17443/880036) among all the samples sent to hematology laboratory. Rejection ratios were 3.15% (5236/166005) for coagulation tubes, 2.75% (3830/139165) for sedimentation tubes and 1.46% (8377/574866) for whole blood tubes for CBC. The most frequent rejection reasons were clotted specimen (64.06%), insufficient volume (22.88%) and hemolyzed specimen (4.53%) for coagulation tubes; clotted specimen (48.36%), insufficient volume (30.08%), and excessive sample volume (14.44%) for sedimentation tubes; and clotted specimen (78.3%), insufficient volume (8.98%) and hemolyzed specimen (4.55%) for CBC tubes. The areas of collection as well as the

reason of rejection were recorded and the results were as follows: The overall rejection rate ranges from 0.51% to 28.0%. Highest rejections seen from Neonatal Intensive Care (28.0%) followed by Inpatient Pediatric Surgery (6.79%), Inpatient Pediatric Services (5.89%), Inpatient Oncology Services (5.80%), Emergency Unit (5.12%), Inpatient Medical Services (4.14%), Medical Intensive Care (3.76%), Inpatient Hematology Services (3.11%), Surgery Intensive Care (2.97%), Inpatient Surgery Services (2.62%), Psychiatry Departments (1.41%), Outpatient Pediatric Services (0.78%), Outpatient Hematology Services (0.72%) and Outpatient Phlebotomy Services (0.51%).

Conclusion: The most reasons of rejection of specimens in the hematology laboratory were mainly related to phlebotomy technique. In the phlebotomy trainings given to the blood samples drawing units, circumstances for each tube type must be highlighted.

Keywords : Hematology, Rejection rate, Preanalytical errors

Laboratory Management and Quality Control

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Abstract Reference : 251

Does The Prostate Specific Antigen Has A Diurnal Variation?

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Objective: Prostate specific antigen (PSA) is an important tumor marker for following of patients with prostate cancer who underwent radical prostatectomy. Many laboratory tests have some variations at different time intervals in a day. In order to make a correct and reliable decision on the follow-up of patients, we investigated the diurnal variations of PSA.

Materials and Methods: Blood samples were taken from 11 healthy males volunteers between the ages of 18-50 at 09.00, 12.00, 15.00, 18.00 and 24.00 hours. Volunteers' blood was taken at 09.00, 12.00 and 18.00 hours before breakfast, lunch and dinner. The samples taken at 09.00 were accepted as basal. The results of PSA in blood samples obtained at 12.00, 15.00, 18.00 and 24.00 were statistically and clinically compared with the results at 09.00.

Findings: There was no statically and clinically significant variations in PSA during the day. PSA had a variation up to 1.56%-3.13% in a day and these variations were less than desirable bias.

Conclusion: In our study, PSA concentrations in healthy men did not showed significant variations in the day.

Keywords : Diurnal rhythm, fasting, postprandial period, biochemical tests

The Importance of C-Reactive Protein in Treated as Outpatients

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Aim: C-reactive protein (CRP) is an acute phase protein precursor. Serum levels are increased in response to inflammation, infection and trauma. Also, smoking, older age, obesity, plasma triglycerides and increase of various cardiovascular markers. CRP is also used in assessing the course of acute clinical disease and response to treatment. White blood cell count (WBC) increase is an important indicator in the diagnosis of infection. However, it cannot determine the treatment approach alone. The aim of our study was to investigate the diagnostic efficacy of C-reactive protein (CRP) in adult patients who applied for distant therapy and to demonstrate a change in the number of WBC.

Materials and Methods: A total of 6091 adult patients, 2041 males and 4050 females who applied to the SAUM Antalya Training and Research Hospital Internal Medicine polyclinic, participated in this study. We measured CRP levels and WBC counts. The Beckman Coulter AU5800 analyzer was used for CRP and the Beckman Coulter LH780 was used for the WBC. Data were calculated as mean \pm SD.

Results: The normal level of CRP was 4032, of which 2672 were female and 1360 were male patients. The high level of CRP was 1459, of which 1359 were female and 670 were male patients. The mean normal CRP levels were 2.2 ± 1.36 mg / L in women and 2.1 ± 1.28 mg / L in men. The mean high CRP levels were 9.1 ± 4.2 mg / L in women and 10.8 ± 11.3 mg / L in men. Although the greater the number of female patients CRP levels in male patients were higher compared to female patients. Low WBC count were found in 180 (124 women, 56 men) (3.89 ± 0.52 10³ / mm³ in female 3.92 ± 0.52 10³ / mm³, 3.82 ± 0.52 10³ / mm³ in male) patient. Normal WBC count were found in 5331 (3571 women, 1760 men) (7.43 ± 1.51 10³ / mm³ in female and 7.44 ± 1.49 10³ / mm³ in male) patient. High WBC count were found in 580 (359 women, 221 men) ($13,61 \pm 7,60$ 10³ / mm³ in female and $13,06 \pm 3,010$ 10³ / mm³ in male) patient. WBC has been found to be mildly high in female patients. It observed an increase of WBC correlate with CRP.

Conclusions: As a result, CRP level and WBC increase were seen in patients who applied to internal medicine polyclinic. Recent studies indicate that CRP is not only an inflammatory biomarker but also an important risk factor for cardiovascular disease, hypertension, diabetes mellitus, and kidney disease and age. As the causes of CRP and WBC elevation are among the leading causes of infection, preventive health services should be given more importance in order to protect public health, reduce the burden of health institutions and prevent unnecessary spending on health.

Keywords : CRP, WBC, Infection, Inflammation

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Comparing The Immunoassay And High-Performance Liquid Chromatography Methods For 25 Hydroxyvitamin D Assessment

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Aim: 25-hydroxyvitamin D [25(OH)D] is already being analyzed with immunometric method and with high-performance liquid chromatography (HPLC). The aim of this study was to compare these two methods for 25(OH)D assessment. The plasma and serum were also compared for the immunometric assay.

Materials and Methods: Blood samples were collected from 28 patients into BD Vacutainer plastic plasma K2 EDTA (Becton Dickinson and Company, BD Plymouth, PL6 7BP, UK) tubes to compare two methods for 25(OH)D measurement. All samples were studied with both HPLC and immunometric methods on Ultimate 3000 HPLC Systems and Abbott Architect i2000 Systems, respectively. The results of 25(OH)D with two methods were analyzed with linear regression analysis and Pearson correlation coefficient (r), statistically.

To compare the plasma and serum, 24 samples were analysed with the immunometric method. The venous blood was collected into both BD Vacutainer plastic plasma K2 EDTA and BD Vacutainer plastic plain tubes for 25(OH)D measurement. Kolmogorov Smirnov test was used to check the variables for normality. For those Gaussian distributed data, mean \pm SD values were used for comparison. Paired samples t-test was used statistically.

Results: Comparing the plasma levels of 25(OH)D, the correlation between two measurements with two methods were acceptable ($r=0.985$; $p<0.001$). The two sample types, plasma and serum 25(OH)D concentrations determined immunometrically, were found as acceptable ($p=0.137$), and the bias was calculated as 2.22%.

Conclusion: Both of the methods can be used for evaluation of 25(OH)D and also both serum and plasma are available for measuring 25(OH)D with immunoassay method.

Keywords: 25 hydroxyvitamin D, high-performance liquid chromatography, immunoassay, serum, plasma

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Gene Polymorphisms In Overactive Bladder Women

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Aim: In human urinary bladder, β_3 adrenergic and muscarinic 3 receptors play an important role in voiding physiology. Single nucleotide polymorphisms might have phenotypic consequences influencing their metabolic function or may contribute to the pathophysiology of several disorders like overactive

bladder (OAB). We aimed to determine the impact of gene polymorphisms on detrusor contraction-relaxation harmony in women with OAB syndrome.

Materials and methods: In this study 60 women with idiopathic OAB and age-matched control women without OAB were enrolled. Genomic DNA was isolated from all patients and subjected to PCR for amplification. The Trp64Arg polymorphism in ADRB3 gene, Arg338Thr polymorphism in ARGHEF10 gene and Thr431Asn polymorphism in ROCK2 gene related with muscarinic receptors were detected by quantitative Real Time Polymerase Chain Reaction.

Results: The mean weight, height and body mass index in the OAB group were not significantly different from those in the non-OAB group and also we found no statistically significant difference in the genotype and allele frequencies between the patients and controls for all three SNP.

Conclusion: Genotypic distribution of ADRB3, ARHGEF10 and ROCK2 genes in OAB patients is not different from the control group. Although the polymorphism of gene in the adrenergic pathway did not significantly differ the severity of clinical findings, OAB patients also have a heterozygous polymorphic structure of the ROCK2 gene which increases OAB symptom score in muscarinic pathway. As a result of our study, we found that the polymorphisms of the β -adrenoceptors and related proteins of muscarinic receptor genes were present in both OAB group and healthy subjects, but the polymorphisms were not associated with OAB syndrome.

Keywords : Polymorphism, Overactive bladder

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P-150

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Determination Of Median Values Of Test Used In Double Screening

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Aim: In prenatal screening the risk calculations are based on multiples of median (MoM) values so, it may be important to determine regional median values. The aim of this study is to determine the regional median values of biochemical parameters which are used for calculation of risk in the double prenatal screening.

Materials and Methods: 2058 singleton pregnant women who were admitted to Eskisehir Osmangazi University Hospital between January 2014 and May 2018 for prenatal double screening test were included in the study. Free Beta-human chorionic gonadotropin (β -hCG) and pregnancy-related plasma protein-A (PAPP-A) values were examined retrospectively and new median values of these parameters were calculated. The difference between the MoM values were statistically evaluated with calculated using the existing median values in the computer program and the new values which were calculated with regional median values.

Results: The median values suggested by the Roche Diagnostics to β -hCG in 11-14 weeks are respectively 57.3; 42.8; 34.5; 29.5 mIU/mL and the new calculated medians were 36.6; 31.5; 28.9; 25.5 mIU/mL. The median values suggested by the Roche Diagnostics to PAPP-A in 11-14 weeks are respectively 1144; 1647; 2664; 4349 ng/mL and the new calculated medians were 2108; 2951; 3931; 6287 ng/mL. We noticed that the computer th program doesn't use the medians of weeks, it uses medians of days. In every weeks there was a significant difference between the MoM values calculated by the new weekly median values of β -hCG and PAPP-A and the MoM values calculated by the median values of the program ($p < 0.001$).

Conclusion: In this study it is found that the use of regional median values in the risk calculation of diseases such as chromosomal anomalies and neural tube defects affected the performance of prenatal screening tests.

Keywords : f β -hCG, PAPP-A, MoM, double screening test, Eskisehir

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The Significance Of Staff Training In Reducing Specimen Rejection

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Aim: Assessment of specimen rejection rates is an important laboratory quality measure for clinical laboratories because of its negative impact on patient care. In order to reduce the rejection rates ,we planned phlebotomy trainings for the pediatric emergency rooms (PER) and internal medicine inpatient clinics (IMIC) on 01 February 2018. The purpose of this study was to evaluate the effect of training on the specimen rejection rates between pre and post training periods.

Material and Methods: Phlebotomy trainings were given to the IMIC and PER staff. Data of rejected samples from both departments were retrieved from the laboratory information system (LIS). We compared the change in specimen rejection ratios between pre (February- July 2017) and post (February-July 2018) training periods .

Results:

Regarding IMIC, in the pre-training period, 25.504 specimens were received and 1.281 (5.0%) were rejected. In the post-training period, in 28.831 specimens received from IMIC 1.880 (6.5%) were rejected.

As for PER, in the pre-training period, from 11.424 specimens 250 (2.2%) were rejected. In the post-training period, 12.024 specimens were received and 248 (2.06%) were rejected.

In IMIC specimens, hemolyzed specimens rejection ratio was 0.8% and 0.57%; incorrect tubes rejection ratio was 0.17% and 0.03 % in the pre and post-training periods, respectively. Likewise, in PER specimens, incorrect tubes rejection ratios were 0.12% and 0.008 %, respectively. A statistically significant difference was found between the periods in terms of rejection causes by chi-square statistical analysis (p <0.05). In addition , in the pre and post-training periods in the specimens of both IMIC and PER, the rejection rates of coagulation specimens were 15.7% and 27.4%, the rates of rejection of biochemistry and hormone samples were calculated as 2.7% and 1.7%, respectively. A statistically significant difference was found between the periods in terms of collection sides by chi-square statistical analysis (p <0.05).

Conclusions: Phlebotomy training significantly reduced specimen rejection rates observed in biochemistry-hormone units due to hemolysis. The incidence of incorrect tubes in both IMIC and PER decreased significantly. In order to reduce specimen rejection rates, a biochemistry specialist should establish professional phlebotomy teams. All staff should periodically go through standardized practical trainings in small groups.

Keywords : phlebotomy training, rejection ratios, phlebotomy teams

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Evaluation Of Family Screening Results In The Patients With FMF Genotypes AS M680I/M680I, M694V/M694V, M694V/0, M680I/0, M694V/M680I/R202Q, M694V/E148Q/R202Q, M694V/R202Q, E148Q/0.

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Summary : Familial Mediterranean fever (AAA) is an autosomal recessive genetic disorder. This disease especially occurs in populations originating in the Mediterranean region as Armenian, non-Ashkenazi Jews, Turks and Arabs. Usually attacks last 1-3 days and commonly keeps on the knees, wrists and elbows, fever attacks at certain times and accompanying with inflammation of serous membranes; peritonitis, arthritis, pleuritis and acute synovitis and these symptoms are lack in the absence of attacks. In patients with the same mutations having a different clinical picture in addition to a different patient carrying the same mutation no clinical picture can be seen. In our study starting from these clinical features in patients with carrying M694V, M680I, E148Q and R202Q mutations subjected were screened of their family and clinical signing was investigated. For this purpose patients who previously carried these mutations (mutations of E148Q and R202Q in exon 2 and M60I and M694V mutations in Exon10 were examined) were identified as blood was collected from 12 patients and 44 relatives of patients. As a result, relatives of patients with the same mutation there is no clinical indication it is clearly seen in this study. Individuals carrying with same FMF mutations have different clinical manifestations it is possible to say that may be related to (penetrance) effected mutant gene region.

Keywords : MEFV gene, family screening, E148 Q, M680I, M694V, R202Q

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Can JC Polyomavirus Be One Of The Causes Of Idiopathic Male Infertility?

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Infertility is a common medical condition, with a prevalence of around 15% in couples worldwide. After varicoceles, the most common diagnosis of male infertility is idiopathic, accounting for 25% of cases. Worldwide, infections are another important cause of infertility. Bacteria that affect the reproductive system can cause infertility by a number of methods (1,2). However viral infections as a cause of male infertility have been less well-studied. An impact on fertility is suggested, but not well understood. Many viruses are frequently present even in asymptomatic males, and they are often associated with poor sperm quality (3, 4). The present study aimed to investigate whether BK polyomavirus (BKV) and JC polyomavirus (JCV) are associated with male infertility. A long-term prospective study was undertaken in infertile men and a control group of healthy males. Between 2014 and 2016, 80 semen and 80 urine samples were collected from infertile males who were attending the infertility clinic with low sperm concentration, decreased motility and abnormal sperm morphology. Controls samples were 60 semen and

60 urine from healthy males who had fathered children. Inclusion criteria were man aged 25-45 years living in rural and urban centers of Konya in the Internal Anatolia region of Turkey, who were non-smokers and who had not had previous urinary tract surgery. Men who were in the other age groups, from different geographical regions, or who had malignancy or were receiving immunomodulatory or immunosuppressive treatment were excluded. All patients in the study group had a diagnosis of idiopathic infertility; none had sexually transmitted infections, epididymitis, prostatitis, urinary tract infections or male accessory gland infection. The presence of BKV and JCV was investigated by real-time polymerase chain reaction on clinical samples. To detect JCV and BKV; a kit LightMix® polyomaviruses JC and BK (Roche Diagnostics, Tibmolbiol), multiplex PCR in real-time was performed. JCV positivity was 62.5% (50/80) for urine and 40% (32/80) for semen in the infertile group. In control group, JCV positivity was 38.3% (23/60) for urine and 35% (21/60) for semen. Only one patient of control group had BKV positivity in urine and semen. The difference of JCV positivity in urine between infertile males and control group is statistically significant. Mean viral DNA load of JCV was found significantly higher value compared to control group in urine and semen samples. In conclusion, the role of chronic viral infections as an etiologic factor of male infertility is believed to be underestimated. We detected an unexpectedly high prevalence of JCV from asymptomatic infertility patients compared to the control group and these results can be an important finding in elucidating the etiology of idiopathic infertility. The study was approved by our university ethical committee and supported by Necmettin Erbakan University, Scientific Research Project Coordinator.

Keywords : Polyomavirus; male infertility; PCR; BK virus; JC virus.

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The Three-year Rates of Influenza Virus Types at a University Hospital, in Konya, Turkey

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Introduction: Influenza is an acute respiratory illness caused by influenza viruses, attacking mainly the upper and infrequently the lower respiratory tract. The aim of the present study is to determine the rates of influenza viruses at a university hospital in Konya between September 2015 and May 2018.

Material and Method: A total of 3623 nasopharyngeal swab specimens from the patients with acute respiratory symptoms, who consulted to Meram Faculty Hospital between September 2015 and May 2018 were retrospectively included to the study. The specimens were investigated using Seeplex RV12 ACE Detection multiplex PCR (Seegene, South Korea) and FTD Respiratory pathogens 21 (Fast-track Diagnostics, Luxembourg).

Results: Influenza viruses were detected at the rates of 21.5%, 10.7%, and 38.4% during the influenza seasons in 2016, 2017, and 2018, respectively. In 2016, influenza A, B, and C were detected at the rates of 23.1%, 56.3, and 20.6%, respectively. While influenza A and B were detected as 35.8% and 64.2% in 2017, the detection rates shifted to 89.6% and 10.4%, respectively.

Conclusion: There were alterations in the rates of the circulating influenza viruses from 2015 through 2018, at the university hospital in Konya, Turkey. Also, it was shown that there was an influenza A outbreak during 2018. Although detecting the rates and types of the influenza viruses are not sufficient to prevent severe complications and minimize economic burden due to labor loss, the data is useful to emphasize the yearly alterations seen in different geographical areas.

Keywords : Influenza A, influenza B, influenza C, outbreak, multiplex PCR

Association Of Pro-Ghrelin Gene Polymorphism With Obesity, Metabolic Syndrome, Serum Ghrelin And Obestatin Levels In A Tunisian Population

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Background: Obesity is considered as a chronic disease by the World Health Organization (OMS). The ghrelin gene GHRL is a candidate in several studies focusing on the genetic variations involved in obesity and associated comorbidities. This gene encodes the preproghrelin which is cleaved to give two peptides, ghrelin and obestatin. It was reported that some polymorphisms of GHRL might influence their concentrations and/or activities. Our objective is So to study the possible relationship between genetic polymorphisms of GHRL, plasma levels of obestatin and ghrelin obesity.

Methods: We recruited 197 obese and 229 healthy controls. Genotyping of the GHRL polymorphisms: rs26802, rs696217 and rs4684677 was performed by RFLP-PCR. Ghrelin and total plasma obestatin were assayed by a quantitative sandwich enzyme immunoassay: ELISA. The statistical study was carried out on SPSS v20 software haplotype analysis was performed by SNP analyzer2.

Results: The study of the variation of the plasma levels of ghrelin and obestatin according to the genotypes does not show a significant difference of their concentration between obese and normal weight subjects nor between the different genotypes of the gene polymorphisms of the GHRL ($P > 0.05$).

We have shown that both SNPs rs696217 and rs4684677 mutation are probably risk factors of obesity. According dominant model we noted that T allele of rs696217 and rs4684677 increase the risk of obesity with adjusted OR of 6.47 [2.18-19.23] $p < 0.001$ and 2.16 [1.41-3.31] $p < 0.001$ respectively. While the mutated allele C of rs26802 gives either an increased risk or a lower risk of metabolic syndrome depending on the haplotype on which it can be found. The SNP combination within the GHRL respectively: rs26802,rs696217 and rs4684677 was marginally associated and the haplotype CGT was found to be a risk of obesity with OR of 5,138 [1,457-17,89] and $p=0,004$ also was found to be a risk of metabolic syndrome with OR of 2,066[1.157-3.690] and $p=0.012$. On the other side the haplotype CGA was found protective for metabolic syndrome with OR 0,632 [0.417-0.956] and $p=0,029$.

Conclusion: Ghrelin and obestatin concentrations don't show a significant difference according to the genotypes. But mutant allele of rs4684677 and rs696217 increases significantly the risk of the obesity. Only rs4684677 increase significantly the risk of metabolic syndrome. A GHRL haplotypes was also associated with an increased risk of obesity and metabolic syndrome except only one protective association was observed in our study.

Keywords : Ghrelin, Obestatin, SNPs, Obesity, metabolic syndrome

Innovative Predictive Factors For Endometrioma Recurrence

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Study Objective: To investigate the expression factors of proliferation and apoptosis (ki-67, bcl-2), inflammation factors (NF-k β p65, COX-2), adhesion factors (b-catenin), estrogen (ER- α) and progesterone (PR- α) receptors in ovarian endometrioma from patients with recurrence of ovarian endometrioma using immunohistochemical analysis.

Design: The case-control study.

Patients: Patients were divided into two groups depending on the course of the disease during the follow-up period of 1.5 years after surgical treatment: 19 patients with recurrent ovarian endometrioma and 29 patients without recurrence ovarian endometrioma. The diagnosis of endometriosis was confirmed histologically.

Interventions: In this study histological and immunohistochemical methods were used. Histological analysis was carried out according to a standard procedure. Immunohistochemical analysis of ovarian endometrioma was carried out using the Tissue-Tek Quick-Ray kit, which allows the preparation of paraffin blocks with a large number of tissue samples (tissue microarray). Antibodies to ki-67 (clone 30-9), bcl-2 (clone 124), NF-k β p65 (clone p65), COX-2 (clone CX-294), b-catenin (clone 14), ER- α (clone SP1) and PR- α (clone 1E2) were used. Statistical analysis was carried out using Statistica 10.0 and MedCalc.

Measurements and Main Results: Increased PR- α (p=0,028) and decreased ki-67 (p=0,044) expression in epithelial component, decreased NF-kb p65 (p=0,0082) and COX-2 (p=0,0025) expression and increased b-catenin (p=0,017) expression in stromal component of ovarian endometrioma were found in recurrent group. ER- α and bcl-2 expression in ovarian endometrioma is not significantly different between the study groups. The area under ROC curve for PR- α , NF-kb p65, COX-2 and b-catenin was 0.769 (p=0,0125), 0.773 (p=0,0006), 0.815 (p<0,0001) and 0.752 (p=0,0036), respectively.

Conclusion: PR- α , NF-kb p65, COX-2 and b-catenin are promising predictive factors for recurrence of ovarian endometrioma. The immunohistochemical analysis of the PR- α , NF-kb p65, COX-2 and b-catenin expression in ovarian endometrioma will allow to define patients with high risk of a recurrence of ovarian endometrioma and to individualize postoperative treatment.

Keywords : endometrioma, NF-kappa-beta, COX2, Ki-67, bcl-2, beta-catenin, ER,PgR, recurrence

Liquid-Based Cytology Of Fallopian Tube Smears In Intraepithelial Precancerous Lesions Diagnostics

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Objective of the study: evaluate the possibilities of diagnostics of benign and precancerous lesions of the tubal epithelium by comparison of liquid-based cytology sampling and histological specimens.

Materials and methods: 23 fallopian tubes from 14 patients (mean age $47,3 \pm 13,3$ years) with ovarian high-grade serous carcinoma (HGSC) (n=6), serous borderline ovarian tumors (SBOT) (n=7), benign ovarian tumors (n=10) were analysed using liquid-based cytology, histology, immunocytochemistry (ICC) (bcl-2 expression) and immunohistochemistry (IHC) (p16 and Ki-67 expression). A chi-square test for a contingency table was used for statistical analysis.

Results. Hypocellular smears were revealed in 48% of cases, normocellular in 32% of cases, and hypercellular - 20%. Marked anysonucleosis were revealed in 16% of cases, moderate - in 24%, and slight - in 40%. Marked irregularities of the nuclear membrane were found in 8% of cases, moderate - in 16%, slight - in 40%, and were absent in 28% of cases. Nuclear chromatin was hyperchromic in 32% of cases, mixed - in 44% and hypochromic - in 24%. Varied nuclear shape was found in all groups, but most often it was detected in patients with HGSC (in 83% of cases) and less often - in patients with benign tumours (in 30% of cases). The nucleoli were multiple in 48% of cases, single - in 24% and were absent in 28% of cases. Statistically significant differences were found for two studied parameters only: nuclear polymorphism and irregularities of the nuclear membrane, which significantly more often were found in patients with HGSC ($p < 0.05$). In HGSC group histology of resected fallopian tubes revealed serous tubal intraepithelial carcinoma (STIC) in all cases (in 43% of cases in combination with invasive fallopian tube carcinoma), and in all cases there were more than 10 SCOUTs (secretory cell outgrowths) of 30 or more adjacent secretory cells. In borderline tumors group the papillary tubal hyperplasia was found in 72% of cases, normal tubal epithelium - in 28%, and more than 10 SCOUTs were found in 60% of cases. In benign ovarian tumors group more than 10 SCOUTs were found in 20% of cases, and normal tubal epithelium was detected in the rest of cases. Therefore, STIC and more than 10 SCOUTs significantly more often were found in HGSC, whereas papillary tubal hyperplasia - in borderline ovarian tumors ($p < 0.01$).

Conclusion: Our study has demonstrated that liquid-based cytology can be used for the determination of fallopian tube epithelial malignant and benign cells and verification such precancerous intraepithelial lesions such as SCOUT and STIC. Thus, this method can play a leading role in ovarian cancer screening.

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Keywords : STIC, serous ovarian carcinoma, liquid-based cytology

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Erythropoietin And Hecpidin In The Blood Of Pregnant Women With Anemia Of Chronic Disease After Ferrotherapy

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Aim: the main goal of our investigation was to detect the erythropoietin and hepcidin concentration in blood plasma of pregnant women with anemia of chronic disease before and after ferrotherapy.

Materials and Methods: there were 110 pregnant women divided into 2 groups. 1-st group (80 ones) was represented by pregnant women with anemia of chronic disease. The control group consisted of 30 healthy pregnant women. The erythropoietin and hepcidin were measured in blood plasma before and after ferrotherapy using ELISA assay.

Results: the results demonstrated decreasing of erythropoietin (by 1.3 times, $p < 0.05$) and increasing of hepcidin (by 1.74 times, $p < 0.05$) concentrations in plasma of 1- st group patients in comparison with control ones. After ferrotherapy we observed significant decreasing of erythropoietin and increasing of hepcidin in comparison with the same parameters before treatment (by 1.39 times and by 2.1 times, correspondingly, $p < 0.05$).

Conclusion: our results demonstrated the ferrotherapy to promote hepcidin increasing that led to decreasing the iron absorption in intestine. In combination with progressive declining of erythropoietin it contributed the development of severe anemia and pregnant complications, including nephropathy.

Keywords : erythropoietin, hepcidin, pregnant women, anemia of chronic disease, ferrotherapy

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Retrospective Evaluation of MEFV Gene Distribution in Individuals with Familial Mediterranean Fever Referred to Mustafa Kemal University Application and Research Hospital

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Aim: Familial Mediterranean fever (FMF) is a hereditary disorder characterized by episodes of fever and serosal inflammation. The FMF is common in Sephardic Jewish, Armenian, Turkish, Greek, Italian and Arabic descent. Our country is a health problem with a frequency of 1/1000 in our province and 1/5 in the carrier. In this study, it was aimed to retrospectively investigate the distribution of demographic data, types of genetic mutations and mutations of familial Mediterranean fever patients in Hatay region between 2010-2017.

Materials and Methods: A total of 2639 patients who were diagnosed with FMF between the years of 2010 and 1717 and who required genetic mutation analysis (3009) were included in the study. The demographic data of the patients were collected via the Hospital Information Management System (HBYS). Mutation analysis revealed mutations in exon 2, exon 3, exon 5 and exon 10. Genomic DNA was isolated from whole blood. Four different forward and reverse primers for Exon2, Exon3, Exon5 and Exon10 MEFV gene regions were used in PCR amplifications. Amplification examples were sequenced according to the ABI PRISM BigDye Terminator Cycle Sequencing Ready Reaction Kit instruction. Sequence reactions were analyzed by automated fluorescence-based sequencing reader. The mutations were confirmed by the sequence of antisense DNA strands. The data were analyzed statistically with SPSS 21.0.

Results: Of the 2639 samples that participated in the study between 2010-2017, 1374 (52%) were female and the mean age (year) was $16,5 \pm 14,2$. The number of male specimens is 1265 (48%) and the average age (year) is $16,5 \pm 14,1$. 1793 (67.9%) were younger than 18 years old while 846 (32.1%) were over 18 years old. In our study, there was no significant difference in mutation frequency distribution among children (<18) and adult (≥ 18) except for E148Q heterozygote. E148Q was significantly higher in the 18-year-old group ($p < 0.05$). 225 different alleles (complex alleles, compound heterozygotes, heterozygotes, homozygotes) were detected in the patients. There were 8 homozygotes, 32 heterozygotes, 42 compound heterozygotes, 143 complex alleles. The most common cases were the G138G Heterozygote / A165A Heterozygous / R202Q Heterozygous complex allele ($n = 605$, 22.63%). In the second case, G138G heterozygote / A165A heterozygote was found ($n = 365$, 14.68%). The total number of mutations was 6748, 1235 (18.3%) homozygotes and 5513 (81.7%) heterozygous mutations. The major mutations were M694V Heterozygote 5,1% ($n = 346$), M694V Homozygous 1,4% ($n = 93$), M680I Heterozygous 1.7% ($n = 116$), M680I Homozygote 0,3% A744S Heterozygous 0,7% ($n = 48$), M694I Heterozygous 0,3% ($n = 22$), M694I Homozygous 0,2% ($n = 13$), V726A Heterozygous 2,1% ($n = 143$), V726A Homozygote E08Q Heterozygote% 6,0 ($n = 447$), E148Q Homozygous 0,4% ($n = 29$), R202Q heterozygous 16,7% ($n = 1126$), R202Q homozygote 2,9% $n = 193$).

Conclusion: Our study is 2639 patients and 54 different genotypes have been included constitutes the highest number reported from Turkey until now.

Keywords : FMF, MEFV, Hatay

Molecular Diagnostics and Genetics

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P-161

Abstract Reference : 239

Significance of HLA-DQA1 Gene Polymorphism on Tuberculosis Susceptibility in West Chinese Population

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Objectives: *HLA-DQA1* gene is essential to the function of the immune system. It mainly plays a central role in the T cell costimulation and T cell receptor signaling pathway by presenting peptides derived from extracellular proteins. Compelling studies have implicated that *HLA-DQA1* is an important gene candidate for tuberculosis susceptibility and its polymorphism is related to immunological response change, notably the specific defense. However, there is little literature addressing the relationship between *HLA-DQA1* gene polymorphism and tuberculosis susceptibility. Therefore, The aim of the study was to preliminarily explore the possible association of single nucleotide polymorphisms (SNPs) in *HLA-DQA1* gene with clinical phenotypes and TB susceptibility in West Chinese population.

Methods: A total of 3 SNPs in the *HLA-DQA1* gene were genotyped in 476 tuberculosis patients and 475 healthy controls from West China by using MassARRAY method through a candidate gene association study. A comprehensive analysis of single locus including the genotypic, genetic models and the allelic frequencies as well as haplotypic construction was carried out to explore the relationships between SNPs and TB.

Results: Genotype frequency of rs2187668 within *HLA-DQA1* gene was significantly different ($p=0.034$) between tuberculosis group and control group. Subjects carrying T allele for rs2187668 indicated a remarkably increased risk in tuberculosis susceptibility (OR = 1.36, 95% CI = 1.03–1.81, $p = 0.003$), whereas individuals carrying A allele for rs9272346 showed a decreased tuberculosis risk (OR = 0.83, 95% CI = 0.70–0.99, $p = 0.046$). In genetic model analysis, the recessive models of rs2187668 and rs9272785 were related to increased susceptibility to tuberculosis (p all <0.05), while genetic model analysis showed that no dominant models of SNPs are associated with tuberculosis susceptibility. There was an increased tuberculosis risk in association with the haplotype TT of rs2187668 and the haplotype AA of rs9272785 within *HLA-DQA1* (OR = 3.27, 95% CI = 1.19–8.99, $p = 0.022$; OR = 1.54, 95% CI = 1.05–2.26, $p = 0.028$, respectively). Further stratification analysis indicated that TB patients with genotype CC for rs2187668 were associated with higher CRP concentrations, and heterozygous patients (GA genotype) of rs9272785 tended to have higher ESR levels.

Conclusion: Our data manifest that SNPs rs2187668 and rs9272785 of *HLA-DQA1* gene were remarkably associated with tuberculosis susceptibility and might influence the expression levels of inflammatory markers of tuberculosis patients in West Chinese population. Further epidemiological and functional studies in larger populations should be conducted to verify our results. *HLA-DQA1* gene polymorphism may become a new biomarker for the diagnosis and treatment of tuberculosis.

Keywords : HLA-DQA1 gene, Single nucleotide polymorphisms (SNPs), Tuberculosis, Biomarker

Nephrology

Status : Accepted - Poster Presentation

P-163

Abstract Reference : 404

The Relationship Between Serum Magnesium Levels, Glycemic Regulation and Proteinuria in Patients with Type 2 Diabetes

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Aim: Magnesium is one of the trace elements with many important functions in the body. One of the most common clinical problems with magnesium deficiency is insulin resistance. Magnesium deficiency is common in diabetic patients and has been shown to be associated with diabetic complications. Diabetes is the most common cause of end-stage renal disease. In this study, it was aimed to investigate the relationship between serum magnesium level, glycemic regulation and proteinuria in diabetic patients.

Material and Methods: 189 Type 2 Diabetes Mellitus (DM) patients were included in this cross-sectional study. Demographic and clinical characteristics of patients and blood pressures were recorded. Glucose, Hemoglobin A1c (HbA1c), BUN, creatinine, electrolytes, lipid profile, magnesium, calcium levels and whole blood counts were studied from serum samples taken from patients. Whole blood samples were collected with EDTA containing tubes and hemogram parameters were assayed by complete blood count analyzer. Urine protein levels were measured in 24-hour urine samples. Patients' estimated glomerular filtration values (eGFR) were calculated using the CKD-EPI formula using creatinine levels.

Results: Hypomagnesemia (<1.7 mg / dl) was detected in 64 patients (34%). Demographic data and laboratory results of the patients are given in Table 1. Serum glucose, HbA1c levels and urine protein levels were significantly higher in patients with hypomagnesemia. There was a weak and negative correlation between serum Mg levels and HbA1c, glucose and urine protein values ($r = -0.187$, $p = 0.011$, $r = -0.152$, $p = 0.039$, $r = -0.149$, $p = 0.044$, respectively). There was no relationship between serum magnesium level and age, body mass index, eGFR diastolic and systolic blood pressures.

Conclusion: Hypomagnesemia is common in Type 2 DM patients. There may be a weak or significant association between serum magnesium levels and glycemia regulation and proteinuria in patients with Type 2 DM. It is important to control serum magnesium levels in diabetic patients with impaired glycemic regulation.

Keywords : Proteinuria, Diabetes Mellitus, Hypermagnesemia, Hypomagnesemia

Nephrology

Status : Accepted - Poster Presentation

P-164

Abstract Reference : 397

The Effects Of Heme Oxygenase 1 On Gentamicin-Induced Experimental Nephrotoxicity

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Aim:Gentamicin (GM) is an aminoglycoside antibiotic utilized to treat gram-negative bacterial infections. The toxic effect on the kidneys limits its clinical use. Heme oxygenase (HO) is the rate-limiting enzyme that catalyzes the breakdown of heme. This enzyme can be induced by various stimuli, including hypoxia, oxidative stress, endotoxin, and is believed to be an important defense mechanism against such injuries. HO-1 induction has also been suggested to play a healing role in acute and chronic renal failure.

The aim of this study was to investigate whether induction of HO-1 through hemin treatment could protect against GM-induced renal toxicity in rats.

Materials and Methods:Gentamicin (100mg/kg/day; i.p.) administered to rats for two weeks with or without hemin (20 mg/kg/48 hours; i.p.). Blood urea nitrogen (BUN) and creatinine levels were measured. The levels of 4-Hydroxynonenal (4-HNE), glutathione and the activities of myeloperoxidase (MPO), superoxide dismutase, glutathione peroxidase and glutathione transferase were measured in the kidney. Histopathological examinations of tissue were carried out.

Results:GM treatment raised BUN and creatinine levels. It also caused an increase in MPO and 4-HNE levels and a decrease in antioxidant enzyme activity in kidney. Histological examination of the kidney showed that GM resulted in tubular inflammation, degeneration, and minimal necrosis. Hemin co-treatment remarkably restored the GM-induced increments in 4-HNE levels and MPO activity while no altering the increase in BUN and creatinine levels. It also caused a remarkably reduction in GM-mediated renal inflammation histologically.

Conclusion:As a result, any therapeutic approach that elevates HO-1 levels may allow more reliable use of this antibiotic in a clinical setting.

Keywords : oxidative stress, gentamicin, heme oxygenase 1

Nephrology

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P-165

Abstract Reference : 295

MDR-1, CYP3A and NR3C1 Polymorphisms in Pediatric Idiopathic Nephrotic Syndrome: Impact on Susceptibility and Response to Steroids (Preliminary Results)

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Background: Following initial glucocorticoid (GC) treatment, the clinical course in children with nephrotic syndrome (NS) is highly variable(1). Intrinsic sensitivity to glucocorticoids might be a determinant of this variability(2). The aim of this study was to investigate the role of SNPs of genes involved in the glucocorticoid pathway in steroid sensitivity in patients with primary NS.

Methods: the study was conducted after getting the local medical ethics committee approval. All patients were recruited from the pediatric department of Sahloul hospital-Tunisia. The study group was composed of 75 children with NS, classified according to their initial response to steroids therapy: High steroid sensitivity (n=16) was defined as a complete remission within four weeks of steroid treatment without presenting relapses. Impaired steroid sensitivity (n=59) was defined as presenting either a dependence or a resistance to steroid therapy. We genotyped the single nucleotide polymorphisms (SNP) of MDR-1 [C1236T (rs1128503), G2677T/A (rs2032582), and C3435T (rs1045642)], the CYP3A [CYP3A5*3 (rs776746), CYP3A5*6 (rs10264272), and CYP3A4*1b (rs2740574)] and the NR3C1 genes [BCII (rs41423247), TthIII-1 (rs10052957) and GR-9b (rs6198)]by PCR-RFLP. We performed statistical analysis on SPSS v.20 and haplotype study on SNP analyser 2.0.

Results: According to the dominant model and after adjustment to potential confounding factors MDR1 variant alleles carriers seem to be associated with impaired steroid sensitivity compared with normal allele carriers. In fact G2677T/A A allele carriers have three times more risk of having an impaired steroid sensitivity (OR=2,9, IC [1,08-38,3], p=0.046). No significant associations were found between the three studied CYP3A's SNPs and glucocorticoides responsiveness. Two polymorphisms of the glucocorticoid receptor gene NR3C1 have been relatively associated with either an increased risk (GR-9beta) or decreased risk (BcII) of an impaired glucocorticoid sensitivity without reaching the significance level (OR= 1.9., IC [0,6-5.9], p=260 , OR= 0,6., IC [0,2-1.8], p=0.322) respectively.

Haplotype study showed synergic effect between studied polymorphisms (C3435T, C1236T, G2677T/A, CYP3A5*3, CYP3A5*6, CYP3A4*22, CYP3A4*1b, BCII,TthIII-1,GR-9b). In fact, carriers of the following genotypic combination CCGGGGCA had a significantly low risk of presenting an impaired steroid sensitivity (OR=0,29 IC [0,01; 0,854] p=0,029)

Conclusions: Studying specific SNPs involved in glucocorticoides pathway may be a promising research field. Our findings could be considered a small step into settling an individualized patient centered approach of steroid therapy in children with NS.

Keywords : Pediatric nephrotic syndrome, steroid sensitivity, genetic polymorphisms

Nephrology

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P-166

Abstract Reference : 309

Evaluation of the Performance of Semi-Quantitative and Quantitative Urinalysis Results with Urine Culture Results Reference

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Objective: Urine analysis and urine culture are frequent examinations for the diagnosis of urinary tract infections. In this study, it is aimed to evaluate the performance of semiquantitative and quantitative urine analysis results based on urine culture positivity.

Materials and Methods: In our retrospective cohort study, between January first, and January thirty first, 2018; all patients who had simultaneous urinalysis and urine culture sample were evaluated. Samples with culture determined to be contaminated were excluded from the study. In the sample of clean voided midstream urine, the presence of 10⁵ Colony Forming Unit (CFU)/mL and above; sample from urine catheter, the presence of 10² Colony Forming Unit (CFU)/mL and above bacteria, was defined as culture positivity. The performance of leukocyte count, leukocyte esterase and nitrite positivity was assessed in a fully automated urine analyzer (iQ 200 ELITE, U.S.A), considering the urine culture positivity as the gold standard.

Results: A total of 1503 patients were enrolled in the study. Positive cultures were yielded in three hundred thirteen of the patients. For distinguishing culture-positive patients from culture negatives; when the cut point was determined as 200, 100, 50, 20, 10 and 5 cell / High Powerfield (HPF), the specificity of leukocyte count was 98.0%, 96.6%, 93.5%, 83.3%, 72.8%, 61.5%, respectively and sensitivity was calculated as 17.8%, 26.9%, 36.7%, 52.0%, 61.8% and 69.1%, respectively. The specificity, sensitivity and negative predictive value of nitrite results were calculated as 99.0%, 23.1% and 82.8%, respectively. Specificity, sensitivity and negative predictive value of leukocyte esterase results were calculated as 58.6%, 64.0%, 85.9%, respectively. Positive predictive value of nitrite (+) and (++) result were 75.8%, 83.3%, respectively; Positive predictive value of leukocyte esterase (+), (++) and (+++) was calculated as 24.4%, 31.1% and 43.9%, respectively.

Conclusion: Clinicians may interpret the results more sensitively if they know the percentages of sensitivity and specificity of semiquantitative positivity of routine urine tests in situations where rapid decision is needed. The leukocyte count of 20 cell/High Powerfield (HPF) is the most valuable with 72.8% specificity and 61.8% sensitivity. Nitrite has been determined to be beneficial, because of its high specificity 99.0% and high negative predictive value 82.8%. It has been reported in the European urine analysis guideline that urine strip analysis should reach 80-90% of leukocyte esterase sensitivity. However, due to the low sensitivity of leukocyte esterase we have calculated, the clinician should not exclude the diagnosis with presence of leukocyte esterase negativity.

Keywords : Urinary tract infection, urine culture, urinalysis, sensitivity, specificity, negative predictive value.

Urine URIT 11F Dipstick Proteinuria Testing: Comparison of Quantitative Protein Assay and Evaluation of Diagnostic Accuracy for Proteinuria in Outpatients Population.33

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Aim: The urine dipstick is widely used as an initial screening tool for the evaluation of proteinuria. The purpose of this retrospective study was to evaluate the test performance of URIT 11F urine dipstick assays for the detection of proteinuria. Also we evaluated its diagnostic accuracy using quantitative methods of protein/creatinine ratio (PCR) in proteinuria.

Materials and Methods: 5743 urine test results data were collected from outpatients with various clinical conditions. Urine dipstick, spot urine protein and creatinine were all available, and the PCR (mg/g) was calculated. The correlation between the URIT 11F urine dipstick and quantitative protein assay was examined. As are reference standard to evaluate the accuracy of urine dipstick for proteinuria, we used two different criteria: PCR ≥ 200 mg/g or PCR ≥ 150 mg/g. We calculated the sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of urine dipstick analysis for proteinuria using two cut off values (negative, trace or more)

Results: A negative dipstick result was obtained in 73.4% of tests and trace positive in 7.8%, 1+ in 6.8%, 2+ in 5.7%, and 3+ in 6.3%. Dipstick test results (negative, trace, 1+, 2+, 3+) were allocated to five levels of urine protein concentration (<14, 14-30, 30.1-100, 100.1-300, >300) respectively. There was a correlation with $r=0.341$ and $p<0.001$. The diagnostic accuracy of a dipstick test result “> negative” in identifying PCR ≥ 200 mg/g was determined. The sensitivity and specificity of the dipstick method were 59.8% and 91.7% respectively; the positive predictive value (PPV) was 79.8%, and the negative predictive value (NPV) was 80.6%. If we set the cutoff value for the dipstick result as trace or greater, the sensitivity decreased to 47.3%, the specificity increased to 96.9%, PPV increased to 89.2% and NPV decreased to 77%. When PCR ≥ 150 mg/g was set as the reference standard and “trace or more” was set as a positive dipstick result, we obtained 36.8% sensitivity, 97.3% specificity, 92.5% PPV, 63.3% NPV. If we set the cutoff value for the dipstick result >negative, the results are as follow: sensitivity, 48.1%; specificity, 92.7%; PPV, 85.5%; NPV, 66.6.

Conclusion: The findings of our study showed that a very good correlation between URIT 11F dipstick and quantitative method. But our results show a high false negative value of dipstick testing. While subsequent laboratory testing can eliminate false positive, but false negative could result in the delay of beneficial early treatment of nephropathy. For this reason, more sensitive proteinuria screening test for patients with potential early stage renal diseases is needed.

Keywords : proteinuria, dipstick, protein/creatinine ratio

Nephrology

Status : Accepted - Poster Presentation

P-168

Abstract Reference : 161

The Relationship Between Fetuin A And Graft Function In Renal Transplant Recipients

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BACKGROUND: Serum fetuin A is a multifunctional glycoprotein which is exclusively secreted from hepatocytes in human. It has been considered to play a crucial role in the protection from vascular calcification by solubilizing calcium and phosphorus in serum. Low serum fetuin A levels are associated with inflammation, vascular calcification and consequently cardiovascular mortality in renal diseases. Due to the reduction of serum fetuin A levels during inflammation and its inhibitory role in calcification and fibrosis, fetuin A serum levels may be considered as a marker of graft function. Therefore we aimed to evaluate the relationship between fetuin A and graft function in renal transplant recipients.

METHODS: In this single-center prospective study, 30 recipients who had undergone living-donor kidney transplantation in Akdeniz University Medical Faculty Organ Transplantation Center were included. Age of patients was 40.30 ± 12.86 years (mean \pm SD, age range: 19-70). There were 20 (66.7%) male and 10 (33.3%) female patients. 12 patients received hemodialysis (HD), 5 patients received peritoneal dialysis (PD) treatment before transplantation. The preemptive kidney transplantation was carried out for 13 patients. Blood samples were collected before and 6 months after transplantation. Serum creatinine and fetuin A levels were measured. Estimated Glomerular Filtration Rates (eGFR) were calculated by "Chronic Kidney Disease Epidemiology" (CKD-EPI) formula.

RESULTS: Serum fetuin A levels showed a significant increase due to the improvement of kidney function after transplantation (mean \pm SD; 767.79 ± 119.55 vs 897.69 ± 155.05 , $p < 0.01$). Although we did not observe any significant correlation between fetuin A and creatinine levels before transplantation, a significantly negative correlation was found after transplantation ($r = -0,341$, $p < 0.05$). Correlation between fetuin A levels and eGFR ($r = 0.447$, $p < 0.05$) was also considered significant after transplantation.

CONCLUSIONS: There are limited data available concerning fetuin A and graft function in renal transplant recipients. In our study, we observed that serum fetuin A levels increased and exhibited time-dependent changes after transplantation. Since fetuin A appears to be a negative acute phase reactant, it can be expected that improvement of renal function and inflammation is associated with increased serum levels of fetuin A after kidney transplantation. Further investigations with larger sample sizes are required to evaluate the association between serum fetuin A levels and allograft outcome.

Keywords : fetuin A, graft function, renal transplantation

Nephrology

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P-169

Abstract Reference : 217

The Comparison Between Creatinine Clearance And CKD-EPI Equation For Estimating Glomerular Filtration Rate In Kidney Transplant Patients

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Aim: The Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) estimated glomerular filtration rate (eGFR) is widely used into clinical practice. The aim of this study was to evaluate the performance of CKD-EPI eGFR in comparison to 24-hour creatinine clearance in kidney transplant (KT) patients.

Materials and Methods: In this retrospective study, we analysed the CKD-EPI formula in comparison to the 24-hour creatinine clearance in stable adult patients after renal transplantation, who applicant to the Pamukkale University Central Laboratory. Creatinine clearance was calculated by 24-hour urine and serum creatinine concentrations measured with the Jaffe method. GFR is estimated by using CKD-EPI formulas.

Results: Sixty seven (n=67) patients were included the study. 52.2% were male, the mean age was 46.9±11.4 years and mean serum creatinine was 1.46 ± 1.00 mg/dL. According to creatinine clearance formula of patients, average GFR values were measured as 58.97±23.69 mL/min/1.73 m², and with CKD-EPI equation as 62.71±23.23 mL/min/1.73 m² (p>0.05). There was a significant positive correlation (r= 0.811, p<0.001) between creatinine clearance and CKD-EPI.

Conclusion: Glomerular filtration rate is important and frequent monitoring test in kidney transplantation. There was a significant correlation between these two parameters and CKD-EPI equations is practical to use for patients, clinicians, and laboratory professionals.

Keywords : Glomerular filtration rate, creatinine clearance, CKD-EPI, kidney transplantation

Nephrology

Status : Accepted - Poster Presentation

P-170

Abstract Reference : 234

Evaluation of Mac 2 Binding Protein, Endocialin and Transforming Growth Factor Beta-1 Levels in Chronic Renal Failure Disease

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Diabetes, glomerulonephritis, hypertension, and polycystic kidney disease are the major etiology of chronic renal failure (CRF) and are a major health problem worldwide. CRF is characterized by ischemic, toxic or metabolic damage and non-recycling loss of nephrons. End-stage renal disease (ESRD) develops in 90% of CRF and fibrosis plays an important role in ESRD pathophysiology. The definitive diagnosis of fibrosis is established by invasive biopsy. However, the only marker that has been accepted as a noninvasive method is serum TGF-β1. In many cases other than fibrosis, the search for new markers is ongoing. In recent years, M2BP and endosialin have been shown to be associated with fibrosis. However,

there are no studies that study serum M2BP and endosialin levels in CRF. Our study consisted of 60 patients with CRF and 30 healthy subjects. TGF- β 1, M2BP and endosialin levels were studied by ELISA method from all subjects. In our study, TGF- β 1, M2BP and endosialin levels were significantly higher in the patient groups than in the control groups ($p = 0,024$ $p = 0,018$ $p = 0,000$ respectively). Serum TGF- β 1, M2BP and endosialin levels of stage V CRF patients were significantly higher than stage I ($p = 0,000$, $p = 0,000$, $p = 0.002$). A positive correlation between TGF- β 1, M2BP and endosialin was observed in the coronary analysis of the CRF patient group ($p = 0,000$ $p = 0,000$ $p = 0.009$). According to the results of linear regression analysis, M2BP and endosialin were found as independent factors affecting TGF- β 1 levels. M2BP and endosialin may be a good indicator for the presence of fibrosis in chronic renal failure.

Keywords : Chronic renal failure, Mac2 binding protein, Endosialin, Fibrosis

Nephrology

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P-171

Abstract Reference : 253

Association of Dyslipidemia, Inflammation and Angiogenesis Common Genetic Variants with Diabetic Nephropathy

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Purpose: Diabetic nephropathy (DN) is a leading cause of end-stage renal disease (1). It occurs as a result of interaction between both genetic and environmental factors. Genetic susceptibility is an important factor for the development and progression of DN (2,3). Numerous genetic variants of lipid metabolism (4-7), inflammation and angiogenesis (7,8) pathways genes, have been found to play a major role in genetic susceptibility. Their identification could help the detection of individuals at high risk for DN which could be helpful for the treatment, diagnosis and early prevention of the disease. In this study, we aimed to determine which of APOC1 rs4420638, CCR5 rs1799987, IL8 rs4073, MMP9 rs17576, EPO rs1617640 and VEGFA (rs833061 and rs3025039) are significantly associated with the development of DN in type 2 diabetes in Tunisian population.

Materials and methods: The study included 236 type 2 diabetic patients: with nephropathy (DN+ = 47) and without nephropathy (DN- = 189). Genotyping was performed by PCR-RFLP. Allelic combinations and statistical analysis were realized using SNP Analyzer2.0 and SPSS20, respectively.

Results: Genotype frequencies were in Hardy-Weinberg equilibrium. After adjustment for potential confounding factors, an increased risk for DN was associated with mutated alleles of rs4420638 (OR = 2,58 [1,006-6,63], $p = 0,048$) and rs4073 (OR = 2,658[1,062-6,651], $p = 0,037$). Adjusted ORs of APOC1-IL8 allelic combination (GT) was 3.43[1,084-10,8] , $p = 0.036$ and of the APOC1-IL8-MMP9-VEGFA allelic combination (GTAC) was 14,9[2,25-50], $p = 0.006$.

Conclusion: The present study highlights that APOC1 rs4420638 and IL8 rs4073 exert an effect on risk of DN and a combination of risk alleles confer a substantial increased risk of nephropathy in type 2 diabetes among Tunisian population.

Keywords : Diabetic Nephropathy, Type 2 Diabetes, Dyslipidemia, Inflammation, Angiogenesis, Single Nucleotide Polymorphisms

Nephrology

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P-172

Abstract Reference : 274

Quantitative Label-Free Proteomic Analysis Of Human Urine And Urinary Exosomes In ANCA – Associated Vasculitis Patients

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Aim: ANCA-associated vasculitides (AAV) are a group of relatively rare, systemic necrotizing small-vessel vasculitis, most commonly affecting kidney, lungs or ENT organs (1). If untreated, most of the patients with AAV die of active disease, including alveolar hemorrhage or renal involvement rapidly progressing into end-stage renal disease. If diagnosed early, the disease can be effectively treated. Urinary exosomes contain proteins and nucleic acids including microRNAs which specifically reflect physiological and pathological conditions of cells from distinct parts of the kidneys (2). Determination of their cargo as potential biomarkers, especially in longitudinal monitoring of patients and their treatment, can allow monitoring the activity of the process, the response to the treatment and the prognosis. In our study, changes in urinary proteome were monitored in patients with AAV by isolation directly from urine or urinary exosomes to determine specific biomarkers.

Materials and Methods: The optimized protocol using carboxylate-modified paramagnetic microparticles at conditions of hydrophilic interaction chromatography (HILIC) was applied for the preparations of urine/exosomes samples (3). After elution by on-bead trypsin/Lys-C digestion, urinary peptides were separated and detected using nano-HPLC-MS label-free quantitative analysis. Statistically significant differentially expressed proteins were evaluated using the bioinformatics "gene ontology" classification analysis.

Results: Over 2000 proteins were identified by the label-free proteomic analysis and around 200 of them were significantly changed. These altered proteins were evaluated in terms of Biological Process, Cellular Component, Protein Class, and Pathway. It was found that the identified proteins are mostly involved in processes of cell communication, metabolic, energetic and cellular transport processes. The role in the neutrophil degranulation seems to be biologically important considering the AAV pathogenesis. The platelet degranulation, proteolysis, and cell adhesion can have similar importance.

Conclusion: The results from the classification analysis of this proteomic study are consistent with the results of our ongoing miRNA study on the same samples. Several potentially significant biomarkers in relation to ANCA disease will be selected and results will be correlated with laboratory and histological findings in disease development for later use in clinical biochemistry.

Work was supported by Ministry of Health of the Czech Republic, grant no. 15-31662A, by Charles University grant Progres Q26 and RVO - VFN64165.

Keywords : Biomarkers, Proteomics, Chronic Kidney Disease, Urine Exosomes, Urine

Platelet And Serum BDNF Level And Response To rTMS Treatment; A Nested Prospective Cohort Study In Croatia

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Purpose: Transcranial magnetic stimulation (TMS) is indirect and non-invasive methods used to induce an electric current in the motor cortex generating a magnetic field that passes through the scalp. Several research were shown higher serum or plasma BDNF level after rTMS treatment but in some there were no connection between serum or plasma BDNF and rTMS treatment in depressed patients. The objective of this study was to examine whether the outcome of rTMS treatment of MDD (major depressive disorders) can be predicted by platelet or serum BDNF concentration levels.

Materials and Methods: This prospective cohort study was nested within the randomized controlled trial conducted at Psychiatric Hospital Sveti Ivan, Zagreb, Croatia during 2017, on the sample of 15 patients, median (IQR) age of 56 (46-63), male 10/female 5 (Table 1.). Outcome was the change in Hamilton Depression Scale (HAM-D17) after four weeks treatment with rTMS. The serum and platelet BDNF concentration has been determined by enzyme-immunoassay method. The content of platelet BDNF is referred to ng/ 10⁹ platelets. The main analysis was done by robust regression.

Results: After four weeks treatment with rTMS, platelet and serum BDNF concentrations were not significantly changed (Table 2). Baseline concentration of platelet BDNF was univariately significantly associated with the absolute change of HAM-D17 result adjusted for the baseline HAM-D17 values ($R^2=0.32$; $p=0.045$). This association strengthened after the adjustments for age and sex ($b=0.51$, $\beta=0.95$, $t=3.89$, $p=0.006$).

Conclusions: Platelet BDNF baseline concentration is a promising biomarker of TMS efficacy in treatment of MDD.

Keywords : Platelet BDNF, Transcranial magnetic stimulation, Major depressive disorder

Cerebrospinal Fluid And Serum Neudesin Concentrations As Potential Novel Biomarkers Of Primary Brain Tumor

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Introduction: Neudesin has neurotrophic abilities and takes part in neuron differentiation and development [1]. It was found that this protein may have also a role in cancer development, as over-expression of Neudesin was revealed in malignant lymphoma, breast, uterine cervix, lung, colon, and skin cancers as well as leukemia and breast MCF-7cell lines [2, 3].

Aim: The aim was to evaluate cerebrospinal fluid (CSF) and serum Neudesin concentrations in primary brain tumor patients compared to non-tumoral individuals.

Material and methods: The study group consisted of 28 patients with previously untreated primary brain tumor divided into: patients subgroup with astrocytic brain tumor and patients subgroup with meningeal tumor. The comparative group was composed of 11 non-tumoral subjects. Neudesin concentrations were tested by means of ELISA method.

Results: The total group with brain tumor had statistically lower serum Neudesin concentration (Me=1.16 ng/mL) compared to non-tumorals (Me=1.47 ng/mL) (P=0.037). Both, astrocytic brain tumor (Me=1.24 ng/mL) as well as meningeal tumor (Me=1.07 ng/mL) subgroups had lower serum Neudesin concentrations compared to controls, but significant difference was found only for meningeal tumor subgroup vs. control group (P=0.012). The total brain tumor group had higher CSF Neudesin concentration (Me=1.18 ng/mL) compared to control group (Me=0.98 ng/mL), but it was not significant. Astrocytic brain tumor subgroup had statistically higher CSF Neudesin concentration (Me=1.31 ng/mL) compared to the non-tumoral group (P=0.046). In contrary, meningeal tumor group showed lower CSF Neudesin concentration (Me=0.66 ng/mL) compared to control, but it was not significant.

Conclusions: In astrocytic brain tumor CSF Neudesin concentration was significantly increased, while in meningeal tumor serum Neudesin concentration was significantly decreased compared to non-tumorals, which may indicate that Neudesin could play a different role in particular brain tumor development, and moreover for the quantitative evaluation the material aspect is important.

Keywords : brain tumor, biomarker, cerebrospinal fluid, Neudesin

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P-175

Abstract Reference : 226

The Three Sisters of Fate in Multiple Sclerosis: Klotho (Clotho), Fibroblast Growth Factor-23 (Lachesis), and Vitamin D (Atropos)

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The klotho (Klt)-fibroblast growth factor-23 (FGF-23)-vitamin D axis is the main component of calcium (Ca) and phosphorus (P) metabolisms; on the contrary, it is also secreted from the choroid plexus (CP). This study is aimed at evaluating serum soluble Klt (sKlt), FGF-23, and 25-(OH)-vitamin D levels in multiple sclerosis (MS) patients. Thirty-two relapsing-remitting MS patients (11 males and 21 females; mean age 38.3 years) and 31 age-sex matched healthy controls (12 males and 19 females; median age 38.5 years) were included in this study. All patients were diagnosed with MS according to the criteria of McDonald. Serum sKlt, FGF-23, and P levels were significantly higher in MS patients compared to the control group ($p < 0.01$, $p < 0.01$, and $p = 0.02$, respectively). Serum 25-(OH)-vitamin D and Ca levels were significantly lower in MS patients ($p < 0.01$ and $p = 0.04$, respectively). Klt, which is secreted from CP, could be a response to the inflammatory condition in MS. Elevated FGF-23 levels suppress 1 α -hydroxylase and upregulates 24 α -hydroxylase, which results in a decrease in 1,25-(OH)₂D₃ levels. Thus, the neuroprotective and immunomodulatory effects of vitamin D might not be seen in MS patients.

Keywords : Klotho, Fibroblast growth factor, Vitamin D, Calcium, Phosphorus

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Nitric Oxide and C-Reactive Protein Levels in Cerebrovascular Infarction

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Purpose: Nitric oxide (NO) is one of the important substances that are synthesized to keep the blood vessels dilated enough to provide adequate flow and to maintain cerebrovascular homeostasis. C-reactive protein (CRP), which is an acute phase reactant, is a highly sensitive indicator of inflammation and tissue damage. High CRP concentrations are thought to have effects such as dysfunction of vascular endothelium and decreased NO release. The purpose of this study was to investigate the levels of CRP and NO and to see the correlation of these markers in acute cerebrovascular infarction.

Method: Fifty patients with cerebrovascular infarction and healthy control group of 31 individuals were included in this study. The patients blood samples were taken initially on admission to the emergency department before any treatment was given. A commercial kit using sandwich ELISA method was used to determine serum NO levels. Serum CRP levels were measured on Beckman Coulter AU 680 autoanalyzer. SPSS 21.0 program was used for statistical analysis. Statistical significance level was taken as $p < 0.05$.

Results: The mean serum NO concentration of the patients was 6.52 $\mu\text{mol/L}$ and the control group was 20.48 $\mu\text{mol/L}$ and there was a statistically significant difference between them ($p < 0.01$). In the

comparison of serum CRP levels, the mean value in patients (13.47 mg/L) was significantly higher than the control group (1.98 mg/L) ($p < 0.01$). There was no significant correlation between NO and CRP levels ($p > 0.05$).

Conclusion: Although we found decreased NO levels and increased CRP levels in the patients, there was no correlation between these two. The results of this study show NO's possible role in neuroprotection and increased levels of CRP may be associated with cerebrovascular infarction. Further studies are necessary to assess the functional interactions between CRP and NO and their contribution to the pathophysiology of cerebral ischemia.

Keywords : cerebrovascular infarction, c-reactive protein, nitric oxide

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Microglia Receptors Polymorphisms And Alzheimer's Disease

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Aim: Microglia, the predominant cells of the central nervous system, express a wide range of receptors acting as molecular sensors. In addition to their classical immune cell functions, microglia are involved in the clearance of amyloid-beta (A β) peptides. In fact, the majority of Alzheimer's disease (AD) risk genes are highly expressed by microglia in the brain. We aimed to evaluate the association of 10 single nucleotide polymorphisms (SNP) from six genes encoding microglia receptors, and AD risk.

Materials and methods: We enrolled 117 AD patients (diagnostic criteria: DSM-IVTR and NINCDS-ADRDA) and 313 controls. Data concerning clinical and biological parameters and life style were collected. Genotyping of the 10 studied polymorphisms (CR1-rs6701713 A>G, LRP1-rs1799986 C>A, CD33-rs3865444 C>A, RAGE-rs2070600 G>A, RAGE-rs1800625 T>C, CD36-rs1358337 G>A, CD36-rs3211938 T>G, VDR-rs2228570 A>G, VDR-rs7975232 A>C and VDR-rs731236 A>G) were performed by PCR-RFLP. Haplotypes and allelic combinations were estimated using SNPAnalyzer 2.0 software and biostatistical analysis were conducted on SPSS 20.0.

Results: After adjustment for potential confounding factors by binary logistic regression, we noted a significantly increased AD risk associated with smoking (OR=2.63; $p=0.010$), diabetes (OR=3.15; $p < 0.001$), hypertension (OR = 2.11; $p = 0.010$), chronic kidney disease (OR=3.64; $p=0.026$) hypocalcemia (OR=3.41; $p=0.001$), hypercholesterolemia (OR=6.80; $p < 0.001$), hypovitaminosis B12 (OR=12.51; $p < 0.001$) and hypovitaminosis D (OR=16.90; $p < 0.001$) whereas high education level (OR = 0.34; $p = 0.036$) and a formally active professional life (OR = 0.15; $p < 0.001$) seemed to be protective.

Our results suggest that among the studied polymorphisms seven were significantly associated with AD. In fact, CR1-rs6701713 G (OR= 1.45; $p = 0.003$), LRP1-rs1799986 A (OR= 1.85; $p=0.016$), RAGE-rs2070600 A (OR= 2.71; $p < 0.001$), CD36-rs3211938 G (OR= 4.96; $p < 0.001$) and VDR-rs2228570 G (OR= 3.76; $p=0.028$) alleles may contribute to AD risk, whereas CD33-rs3865444 A (OR=0.41; $p=0.007$) and VDR-rs731236 G (OR=0.21; $p=0.039$) alleles seemed to have a protective effect.

Haplotypic and allelic combination analysis showed that RAGE AC (OR=2.98; $p=0.014$), RAGE AT (OR=2.45; $p=0.009$), CD36 TA (OR=0.35; $p=0.001$), CD36 GG (OR=2.01; $p < 0.001$) and CD36 GA diplotypes (OR = 3.66; $p < 0.001$), VDR GAA haplotype (OR=5.74; $p=0.010$) as long as four allelic

combinations GACACGGGAA (OR=9.14; p=0.001), GAAATGGGAA (OR=6.83; p=0.030), ACAACATGCG (OR=0.20; p=0.015) and GCAACGTGCA (OR=0.51; p=0.005) were significantly associated to AD.

Furthermore, we noted a significant antagonistic association between CD36 polymorphisms, glycemia, cholesterol and HDL-c level. While CD36-rs3211938 G allele was associated with low HDL-c levels and high cholesterol and glycemia levels (p<0.005), CD36-rs1358337 A allele was associated with high HDL-c levels low cholesterol and glycemia levels (p<0.005). No significant association was observed between VDR polymorphisms and vit-D levels.

Conclusion: The association between the studied SNPs and AD risk support the “amyloid cascade” and the “inflammatory” theories since the genes in question are involved in several AD pathophysiological processes such as A β transport and clearance, inflammation, metabolic syndrome etc... According to our results, a healthy and active life style is recommended to prevent AD, especially for risk alleles and haplotypes carriers.

This study was supported by grants from the Tunisian Ministry of Higher Education, Scientific Research and Technology, and the Tunisian Ministry of Health (LR12SP11)

Keywords : Alzheimer's Disease, Microglia, Polymorphism, Risk factors, CR1, RAGE, LRP1, CD33, CD36, VDR

Neurology and Neurodegenerative Diseases

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Abstract Reference : 89

The CXCL8 Index As The Marker Of Unruptured Intracranial Aneurysm.

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Background: Inflammation may play an important role in the formation and rupture of cerebral aneurysms. Chemokines act as chemoattractants for leukocytes directing them toward sites of tissue inflammation. CXCL8 is one of the first chemokines identified as a chemoattractant and activating factor for inflammatory cells, mainly for neutrophils. Literature data demonstrated high plasma CXCL8 concentrations in the lumen of human cerebral aneurysms. Quantitative data based on biochemical analysis of CXCL8 in cerebrospinal fluid (CSF) and/or serum in unruptured intracranial aneurysm (UIA) patients is still lacking [1,2].

Aim: The evaluation of CSF and serum concentrations of CXCL8 in patients with unruptured intracranial aneurysm (N=25) as compared to control group without UIA (N=10). To exclude possible fluctuations of the blood brain barrier and the blood-CSF barrier, we also calculated the Index for chemokine tested by referring obtained results in CSF to values in serum.

Methods: CXCL8 concentrations were measured using ELISA method.

Results: CXCL8 concentrations were statistically higher in CSF compared to values obtained in serum in both studied groups, UIA patients as well in control group (P<0.0001, respectively). Median CSF CXCL8 concentration in UIA patients (31.25 pg/ml) was higher compared to control (26.50 pg/ml); in contrary, median serum CXCL8 concentration was lower in UIA group (10.89 pg/ml) compared to control group (16.46 pg/ml), however both differences were not statistically significant. The CXCL8 Index was statistically higher in UIA patients (2.83) compared to control group (1.55, P<0.047). The area under the receiver operator characteristic curve (AUC) for CXCL8 Index equaled 0.72, and it was statistically

higher than AUC=0.5, which indicates its diagnostic usefulness in differentiating patients with UIA from individuals without UIA.

Conclusions: Our results indicate that the concentrations of CXCL8 chemokine should be analyzed in both cerebrospinal fluid and serum to calculate the CXCL8 Index, which showed to be the most diagnostically useful in differentiating patients with unruptured intracranial aneurysm from patients without UIA.

Keywords : marker, chemokine, CXCL8, unruptured intracranial aneurysm (UIA)

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P-179

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Determination of Serum Ischemia Modified Albumin Levels in Multiple Sclerosis

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Aim: Multiple sclerosis (MS) is a chronic inflammatory demyelinating disease of the central nervous system in which the inflammatory environment in demyelinating lesions leads to oxidative stress by the generation of oxygen and nitrogen free radicals. It is thought that oxidative stress takes part in the development of brain damage and is one of the contributing factors in the pathogenesis of MS. Albumin is a major determinant of the antioxidant capacity of human serum and ischemia modified albumin (IMA) is presented as a marker of ischemia and oxidative stress. Our aim was to determine the IMA levels in MS patients before and after methylprednisolone therapy during relapses.

Materials and Methods: Thirty two MS patients presented with acute attack were enrolled in the study with 36 controls. MS patients were assessed using the Expanded Disability Status Scale (EDSS) before and after treatment. All the patients were treated with 1000mg/day intravenous methylprednisolone. Blood samples for IMA measurements were collected before and one month after the treatment. IMA levels were determined by a colorimetric method and the mean IMA levels were compared between patients and controls, as well as before and after steroid treatment in the patient group.

Results: The mean serum IMA levels between patient (0.170 ± 0.071 ABSU) and control group (0.105 ± 0.041 ABSU) were significantly different ($p < 0.05$). There was a statistically significant difference in IMA levels before and after the steroid treatment (0.170 ± 0.071 vs 0.244 ± 0.056 $p < 0.05$).

Conclusion: Our data show that oxidative stress is high in the relapse period of MS and it remains surprisingly higher after methylprednisolone treatment. Whether the reason is the therapy or the disease itself, it is concluded that oxidative stress in MS patients still exists soon after the treatment. Therefore factors in the pathogenesis of MS and therapeutic targets should be investigated in larger clinical trials.

Keywords : Multiple sclerosis, ischemia, oxidative stress, methylprednisolone

Ischemia Modified Albumin Levels in Cerebrovascular Infarction

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OBJECTIVE: Cerebrovascular infarction includes diseases in which a region of the brain is temporarily or permanently affected by ischemia. Free radicals resulting from ischemia lead to modifications in plasma proteins. These modifications reduce the cobalt binding capacity of albumin and the resulting new molecule is called Ischemia Modified Albumin (IMA). The increase in IMA may be a marker of oxidative stress. The aim of our study was to investigate changes in IMA levels in ischemic cerebrovascular disease.

METHODS: Forty-seven patients with ischemic cerebrovascular infarction and healthy control group of 31 individuals were included in the study. The serum IMA levels of the patients were measured twice: initially on admission to the emergency department and 24 hours later in neurology clinic. Serum IMA levels were determined spectrophotometrically at 470 nm as absorbance units (ABSU) by colorimetric albumin cobalt binding method which was described by Bar-Or et al. Adjusted IMA (A-IMA) levels were calculated using the formula [A-IMA = IMA x (Albumin / Group's Albumin Median)]. SPSS 21.0 program was used for statistical analysis. Data were presented as mean ± standard deviation. A p value of <0.05 was accepted as statistically significant.

RESULTS: The mean A-IMA of the patient group was 0.507 ± 0.098 ABSU in the first measurements and 0.531 ± 0.073 ABSU at 24th hour. There was no statistically significant difference between them ($p = 0.173$). In the control group, the mean A-IMA was 0.449 ± 0.087 ABSU. IMA levels were significantly different between the patients initial and the following samples compared with the control group ($p < 0.01$).

CONCLUSION: It is thought that the reactive oxygen species that are formed together with free radicals during oxidative stress in acute cerebral ischemia are associated with IMA formation. The detection of significant IMA elevation in patients with respect to the control group supports the diagnostic value of IMA and in the future IMA may be used as a new marker for the ischemic cerebrovascular infarction.

Keywords : cerebrovascular infarction, ischemia modified albumin, oxidative stress

Total Oxidant, Antioxidant Status and Oxidative Stress Index of Children and Adolescent Patients with Obsessive-Compulsive Disorder and Related Disorders

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Child and adolescent obsessive-compulsive disorder (OCD) is a psychiatric disorder defined as the presence of obsessive thoughts and repetitive compulsive actions. Various psychological, social, genetic, and biochemical factors are thought to be involved in the etiology of child and adolescent OCD. Oxidative processes which cause inflammation and dysfunction in neurotransmitters may play an important role in the etiology of OCD and some other neuropsychiatric disorders. Therefore, the aim of this cross-sectional study was to evaluate total oxidant status (TOS), total antioxidant status (TAS) and oxidative stress index in children and adolescents with OCD and related disorders (body dysmorphic disorder, hoarding disorder, trichotillomania and skin picking disorder).

Study group consists of 40 patients (20 girls and 20 boys) with OCD and related disorders whom diagnosed according to DSM-V criteria in Child and Adolescent Psychiatry outpatient clinic of Balcali Hospital of Cukurova University Medical Faculty. Fifty healthy children were included to the study as control group. TOS and TAS levels of sera were measured with automated colorimetric method. Oxidative stress index was calculated with the formula TOS/TAS*100.

There were statistically significant difference between TOS levels of patients and healthy group (Mean±SD: 12,8 ± 10,5 µmol/L; Median:7,9 µmol/L), (Mean±SD: 4,7 ± 2,1 µmol/L; Median:4,4 µmol/L) (p<0.05). Besides there were no statistically significant differences between TAS levels of patients and controls (Mean±SD: 1,9 ± 0,3 nmol/L; Median:1,9 nmol/L) (Mean±SD: 1,8 ± 0,3 nmol/L; Median: 1,8 nmol/L) (p>0.05). There were also statistically significant differences between the oxidative stress indexes of patients and controls (Mean±SD: 675,3 ± 540,2; Median:401,6) (Mean±SD: 279,2 ± 172,4; Median: 243,7 µmol/L) (p<0.05).

Previous studies have shown that oxidative stress plays a vital role in pathophysiology of OCD and related disorders. The reason why oxidative stress is increased in patients with these disorders is still debatable. Although it is assumed that oxidative stress may affect on developing brain especially in hippocampus region via glucocorticoids, glutamate/GABA and inflammation.

However there are only a few studies that show the oxidant status of OCD in child and adolescent age group. In the present study an attempt was made to find out the efficacy of measuring TOS and calculating oxidative stress index markers in patients with child and adolescent obsessive compulsive disorder. In future, clinical treatment studies may focus on antioxidant molecules to helpfull reduce symptoms beyond understanding etiopathogenesis in these age group patients.

Keywords : Oxidative process , Obsessive-compulsive disorder , Etiopathogenesis

Pediatric Laboratory Medicine

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P-182

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The Report Of Some Element (Na⁺, Cl⁻, K⁺, Fe⁺², Mg⁺², Ca⁺², Cu⁺², Zn⁺²) Levels Of Vernix Caseosa.

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A natural product produced by the human fetus “Vernix Caseosa” (VC) secreted in the last three months. This product protected baby from harmful agents, by providing lubrication during normal delivery it also carries a substance feature that facilitates birth and it has some useful features. Fiftytwo babies VC were taken with sterile soft-tipped apparatus. Na⁺, Cl⁻, K⁺, Fe⁺², Mg⁺², Ca⁺², Cu⁺², Zn⁺² levels were investigated from VC samples., Element levels per gram tissue were determined according to these values. In addition, those who are below and upper 35 years old and with multiparas and nulliparas baby’s VC were examined separately. Homogenised samples were measured with Siemens ADVIA 1800 Chemistry analyser and Atomic Absorbtion Spectrophotometer flame unit (Perkin Elmer Analyst 800). Element results were given as mean and standart error; *Na⁺: 12,09±0,58, *Cl⁻: 10,27±1,08, *K⁺:1,84±0,54, **Fe⁺²:72,39±4,84, **Mg⁺²:67,07±3,31, **Ca⁺²:864,51±32,61, **Cu⁺²:12,98±2,01, **Zn⁺²: 11,00±1,55 (*:mg/g tissue, **: ug/ g tissue). With as much as we know until now there is no report on about the VC elements levels. Protein and lipid contents were investigated and it was found that fetal skin VC has an important role in protecting from external factors, infections and there are studies reporting that is contributing to wound healing . Besides these, protection of amniotic fluid from maceration and the prevention of fluid and electrolyte losses of skin is mentioned . It is thought that this research could be a source for other researches to be done.

Keywords : Vernix Caseosa, elements, newborn.

Endocrinology and Metabolism

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P-183

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Hyperinsulinism and SCHAD: Case Report

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Aim: Congenital hyperinsulinism is a primary defect of the pancreatic β-cell leading to an inappropriate secretion of insulin. Hyperinsulinism (HI) may be due to channelopathies, enzymes anomalies or a transcription factor defect. Hyperinsulinism in infancy is a condition characterized by severe hypoglycemia related to inappropriate insulin secretion in neonatal period or infancy. A mutation in *HADH*, the gene encoding the mitochondrial enzyme short-chain 3-hydroxyacyl-CoA dehydrogenase (SCHAD) is associated with HI. SCHAD-HI is characterized by fasting hypoglycemia due to insulin dysregulation. The biochemical markers, in addition to those of increased insulin action, are increased levels of plasma 3-hydroxybutyryl-carnitine and increased levels of 3-hydroxyglutaric acid in urine.

Material and Method: A male patient with no characteristics in routine postnatal screening tests, has had episodes of jitteriness, cyanosis, apnea, hypothermia, poor body tone, poor feeding, lethargy and seizures in the first 8 months of life. Hypoglycaemia was detected in his analysis. When insulin was detected, it was found that the levels were high, and the expanded neonatal acylcarnitine screening and urine organic acid analyzes were also studied.

Results: C4-OH (3-OH butyryl-carnitine) level in acylcarnitine screening and the levels of 3-OH glutaric acid, 2-ketoglutaric acid, 2-OH-3-methyl caproic acid, 2-OH isocaproic acid, 3-OH butyric acid, lactic acid and pyruvic acid were high in urine organic acid assays. Hypoglycaemia was also accompanied by hyperinsulinemia. The patient referred to the genetic counseling and the diagnosis was confirmed as SCHAD with mutation in the *HADH* gene.

Conclusion: When all these laboratory results and the patient's clinic were taken into consideration, it was decided that the patient's hypoglycemia was due to SCHAD-related HI. Diazoxide and protein-restricted dietary therapy was initiated and blood glucose and insulin levels returned to normal. The acylcarnitine assay with Tandem MS should be kept in mind in cases of hyperinsulinemic hypoglycemia because SCHAD is a diagnosable and excludable disease

Keywords : Keywords : SCHAD, Hyperinsulinism, SCHAD-HI, 3-OH Butyryl-Carnitine

Personalized Medicine

Status : Accepted - Poster Presentation

P-184

Abstract Reference : 412

Association Of The SNPs of SLCOB1, IMPDHI and UGT1A9 With The Efficiency And Safety Of Mycophenolate Mofetil Therapy After Kidney Transplantation

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Aim : A considerable interindividual variability in response to mycophenolate mofetil (MMF), the most used immunosuppressive drug for the prophylaxis of rejection in renal transplantation was reported. So we aimed to study the implication of pharmacogenetics (SNP of SLCOB1, IMPDHI and UGT1A9) and of non-genetic factors in this variability

MATERIAL & METHODS : After ethic committee approval, we recruited 223 renal transplant patients under MMF. Genotyping was performed by PCR-RFLP. Blood MMF level was measured by chemiluminescence immunoassay and, Area Under Curve (AUC) was estimated by a bayesian method. Statistical analysis was realized using SPSS20.

RESULTS : Genotype frequencies were in Hardy-Weinberg equilibrium. MMF AUC₍₀₋₁₂₎ was significantly higher in women and in carriers of variant allele of SLCOB1-rs2306283 (p=0.03) and of SLCOB1-rs4149056 (p=0.03) and was lower in men and smokers. After adjustment for potential confounding factors, a significant increased risk for acute rejection seems to be associated with wild alleles of SLCOB1- rs2306283 (OR=3.26, p=0,025) and with mutated alleles UGT1A9- rs17868320 (OR=12, p=0.04). Only variant alleles of UGT1A9- rs17868320 was associated with increased risk of chronic rejection (OR=10, p=0.01). All these alleles were associated with lower MMF AUC and seem to require higher MMF dose. Mutated alleles of SLCOB1-rs4149056 was associated with higher MMF AUC₍₀₋₁₂₎ and with the occurrence of adverse effects (OR=1.64, p=0.02) so lower MMF dose will be required

CONCLUSION : Dosage Adjustment of MMF in function of Gender, smoking and SLCO1B1-rs2306283 ; SLCOB1-rs4149056 and UGT1A9- rs17868320 appear to be useful in renal

Keywords : pharmacogenetics, immunosuppressive drugs, kidney transplantation, MMF, graft rejects

Therapeutic Drug Monitoring and Toxicology

Status : Accepted - Poster Presentation

P-186

Abstract Reference : 129

Lithium, Acetylsalicylic Acid, And Paracetamol Interference In Spectrophotometric Analyses And Immunoassays

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Aim: In vitro interferences originating from the complex matrix of biological fluids within different limitations that may be influenced on quantitative measurement of an analyte in spectrophotometric analyses and immunoassay, are noteworthy. These fluids contain many different types and number of components, such as therapeutic drugs. These components may mimic the physical, chromatographic, or spectral properties of the assayed analyte, as well as the chemical groups of these components may react with the test reagents. There are limited data on interference effects of drugs used in medical practices on laboratory test results, despite the identification of accuracy of drug analysis results in therapeutic drug monitoring. The aim of this study was to investigate the possible interferences of lithium carbonate, paracetamol, and acetylsalicylic acid in subtherapeutic, therapeutic, and toxic concentrations on serum measurements of some medical laboratory tests.

Materials and Methods: Laboratory tests were conducted with the Cobas[®] 8000 series of modular analyzers (Roche Diagnostics, USA) to investigate the interfering effects of drugs. Cobas c 702 and Cobas c 502 modules were used to analyze glucose, urea, creatinine, total protein, albumin, aspartate aminotransferase, alanine aminotransferase, gamma glutamyl transferase, total cholesterol, triglyceride, high density lipoprotein-cholesterol, total bilirubin, uric acid, alkaline phosphatase, lactate dehydrogenase, and creatine kinase. In addition, Cobas e 602 module was used to analyze thyroid stimulating hormone, free triiodothyronine (fT3), free tetraiodothyronine (fT4), vitamin B12, and folate.

Results: In our study, the lower confidence limits of the calculated interferences for fT3 and fT4 (+0.372 pg/mL and +0.143 ng/dL, respectively) at toxic concentrations of 3.3 mmol/L, which are consistent with mild intoxication of acetylsalicylic acid, were above the upper values of the determined total allowable error ranges for these two parameters (+0.368 pg/mL and +0.103 ng/dL, respectively). No significant interference exceeding the determined total allowable error ranges for different concentrations of these three drugs were found except for the proved interferences for these two parameters.

Conclusion: From these results, in vivo and in vitro drug interference studies are required for parameters such as cortisol, testosterone, estradiol, ionized calcium, which are bind to serum proteins and which free forms are important in clinical evaluation.

Keywords : acetylsalicylic acid; immunoassays; interference; lithium carbonate; paracetamol; spectrophotometric analyses

Therapeutic Drug Monitoring and Toxicology

Status : Accepted - Poster Presentation

P-187

Abstract Reference : 402

Adalimumab Mitigates Ovarian Ischemia-Reperfusion Injury in Rats by Regulating Oxidative Stress, Apoptosis and Resolution of Inflammation

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Aims: Ovarian torsion is a rare but an important reason of acute lower abdominal pain in women and associated with serious morbidity and mortality, if not treated promptly. In order to prevent potential necrosis, infertility and life-threatening sequels of this entity, early diagnosis and prompt institution of adequate treatment may be life-saving. In this study, we aimed to evaluate the therapeutic effect of Adalimumab (ADA) on ovarian injury that is induced by ischemia-reperfusion (I/R) in an experimental rat model. Furthermore, we aimed to shed light on the possible mechanisms by which ADA could protect rat against I/R induced ovarian injury.

Methods: Forty female Wistar Albino rats were used in the present study. The rats were randomly divided into four groups: group I (sham), group II (I/R), group III (I/R+isotonic saline) and group IV (I/R+adalimumab). The I/R model was induced by torsion of both ovaries. Immunohistochemical staining for IL-1 beta, NF- κ B and inducible nitric oxide (iNOS) were performed. Tissue and serum oxidative stress markers in conjunction with apoptotic index (AI) with TUNEL method was also calculated.

Results: Tissue total oxidant status (TOS), oxidative stress index (OSI), and nitric oxide (NO) values were significantly decreased and tissue total antioxidant status (TAS) were found to be increased in group IV (Figure 1). Inflammation, vascular congestion, and hemorrhagia were significantly lower in ADA treated group (Table 1). Serum oxidative stress markers and tissue malondialdehyde (MDA) levels did not differ in study groups. The AI was significantly increased in groups 2 and 3. ADA treatment significantly decreased the AI. I/R (group II) caused a significant increase in ovarian expression of IL-1 β (2.40 ± 0.69), NF- κ B (2.40 ± 0.69), and iNOS (2.80 ± 0.42) compared with sham group. Significant reductions in these parameters were observed in ADA treated group in comparison with both group II (I/R) and group III (IR+saline group) ($p < 0.05$).

Conclusions: ADA therapy attenuated I/R induced ovarian injury, possibly due to suppression of inflammation, blockade of oxidative stress and alteration of apoptotic pathways. Our results indicate substantial new aspects of this field and highlight the therapeutic potential of ADA for treating ovarian damage induced by I/R injury with providing the rationale for its use.

Keywords : Ovarian torsion, adalimumab, oxidative stress, immunohistochemistry, apoptosis

Therapeutic Drug Monitoring and Toxicology

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Abstract Reference : 183

Calculation of Measurement Uncertainty of Tacrolimus

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Objective: Tacrolimus, a major immunosuppressant used after transplantation, is associated with large interindividual variation involving genetic polymorphisms. Therefore, therapeutic drug monitoring is essential for tacrolimus to optimize dosage and prevent adverse reactions. Measurement uncertainty (MU) is a quality parameter of measurement results, and characterizes the dispersion of the values attributed to a measured quantity. However, no studies have calculated the MU for tacrolimus. The aim of this study was to estimate the measurement uncertainty (MU) of Tacrolimus.

Methods: Tacrolimus analysis was measured by Siemens Viva-ProE System which work EMIT principle in our laboratory. MU calculations were made according to the Nordtest manual using internal and external quality control values. Laboratory reproducibility bias (uRw^2), laboratory and method bias measurement uncertainty (u_{bias}), uncertainty of calibration (u_{Cref}), combined measurement uncertainty (U_c) and extended measurement uncertainty (U) were calculated.

Results: As a results of calculations; $uRw^2=34.69$; $u_{bias} = 3.36$; $u_{Cref}= 0.44$; and $U_c= 6.78$ were determined. The extended measurement uncertainty for Tacrolimus was $\pm 13.56\%$ within 95% coverage probability ($k=2$).

Conclusions: Therapeutic drug monitoring for tacrolimus was essential for dosage optimization in patients with renal transplantation. The individual measurement uncertainty result for each test should be given to the clinician and the patient together with the test results. Therefore, reporting Tacrolimus results with the estimation of the MU is important to illustrate the true limits and the level of confidence. The tacrolimus measurement uncertainty of other methods should also be known.

Keywords : Measurement uncertainty, Tacrolimus

Therapeutic Drug Monitoring and Toxicology

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P-189

Abstract Reference : 186

Analysis Of Therapeutic Drug Levels And Effective Drug Use

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Aim: In clinical laboratories, it is the responsibility of the laboratory specialist from the appropriate test request until the results are used for patient benefit. For this reason, the laboratory specialist could examine the laboratory data and, if necessary, share this information with the clinician and contribute patient care by using these results. For this purpose, we aimed to analyze the results of therapeutic drug levels studied in our laboratory and contribute to the more efficient use of these tests in this regard.

Materials and Methods: Therapeutic drug monitoring tests measured in our laboratory between July 2017 and July 2018 were reviewed by LIS. Lithium, carbamazepine, phenytoin and valproic acid levels were analyzed by using PETINIA (particle enhanced turbidimetric inhibition immunoassay,

carbamazepine, valproic acid, phenytoin) and spectrophotometric endpoint method (lithium) in Siemens Dimension EXL200 model analyzer.

Results: Within a year, it was found that 1,330 lithium test results (60.1%) out of 2,213 were within the therapeutic range of 0.6 - 1.2 mmol / L, 89 test results were high levels (even 25 of them in toxic levels) and 794 results were below the therapeutic level. In the same period, 48 phenytoin levels out of 208 (23.1%) were within the therapeutic range (10 - 20 µg / mL); 2,311 (%68.9) valproic acid test results out of 3,355 were within the therapeutic range (50 – 100 µg/mL); 695 (%74.2) carbamazepine test results out of 937 were within the therapeutic range (4 – 12 µg/mL). In total, the percentage of drug monitoring tests that were within the mean therapeutic ranges was 65.3% and, approximately 35% was out of the therapeutic range.

Conclusion: The causes of this inconvenience may be preanalytical factors, errors in analysis or patient-caused factors. By sharing this information with clinicians, more appropriate and effective therapeutic drug levels could be obtained. Besides, by consulting with clinicians, we could find the causes of this inappropriate levels which were outside of the therapeutic range and contribute to reaching the target values as much as possible.

Keywords : Keywords: Phenytoin, valproic acid, carbamazepine, lithium, therapeutic drug analysis

Therapeutic Drug Monitoring and Toxicology

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P-190

Abstract Reference : 370

Carnosine Protects Acetaminophen-Induced Liver Injury Via Activation Of The Nuclear Erythroid-Related Factor-2 /Heme Oxygenase-1

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Aim: Acetaminophen (APAP) is an antipyretic and analgesic drug. APAP overdose causes severe hepatic injury. Its hepatotoxic potential result from the generation of a toxic metabolite N-acetyl-p-benzoquinone imine (NAPQI). Excessive NAPQI depletes hepatic glutathione (GSH) and then binds covalently to cellular proteins. Depletion of GSH and excessive production of NAPQI creates oxidative stress, which leads to hepatic necrosis. Nuclear erythroid-related factor 2 (Nrf2) is a transcription factor that regulates cellular defences by inducing the expression of various detoxification and antioxidant genes, such as heme oxygenase (HO-1). Nrf2 deficient mice exhibit increased sensitivity to APAP. Therefore, Nrf2 activation may serve as a shield for the prevention of APAP hepatotoxicity by combating oxidative stress. Carnosine (β-alanyl-L-histidine; CAR) is a dipeptide having anti-inflammatory and anti-oxidant properties. CAR pretreatment was found to decrease lipid peroxidation, inflammation and improve antioxidant system in APAP-treated rats. This study was aimed to investigate the role of CAR posttreatment in APAP-induced acute liver injury by activating Nrf2/HO-1 system. The efficiency of CAR was also compared with N-acetylcysteine (NAC) which is widely used in the treatment of APAP hepatotoxicity.

Materials and Methods: Sprague-Dawley rats were injected with APAP (500 mg/kg) intraperitoneally. One hour after APAP, CAR (250 mg/kg) or NAC (300 mg/kg) were administered to rats, intraperitoneally. Liver samples were collected 8 and 24 hours after APAP. Hepatic malondialdehyde (MDA) levels, Nrf2 and HO-1 mRNA and protein expressions were determined.

Results: APAP increased serum transaminases and hepatic MDA levels, CAR and NAC treatment decreased these elevated levels at 24 h after APAP injection. CAR and NAC caused activation of Nrf2 and HO-1 mRNA and protein expressions after APAP treatment.

Conclusion: Our results indicate that activation of Nrf2 /HO-1 system may play a role in improvement of liver injury due to NAC and CAR treatments in APAP-treated rats.

This study was supported by the Istanbul University Scientific Research Projects (Project No: 2971).

Keywords : Carnosine, acetaminophen, liver injury, oxidative stress

Therapeutic Drug Monitoring and Toxicology

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P-191

Abstract Reference : 326

Elevated Symmetric Dimethylarginine Levels In Manganese-Exposed Welders

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Aim: SDMA, as an indirect inhibitor of NOS, has been demonstrated to act as a impotent molecule for neuronal NOS.Homoarginine (HArg) blocks the endogeneous NO synthesis via competing with arginine (1).The aim of this study was to determine the relation between serum symmetric dimethyl arginine levels and manganese exposure.

Methods: Serum SDMA was analyzed with the Shimadzu LC-20AD system coupled with Applied Biosystems MDS SCIEX (USA) API 3200 mass spectrometry (2). 100 microliters (µL) of internal Standard (d7-ADMA) in methanol were added to 200 µL of serum and centrifuged at 13.000 rpm for 10 minutes to remove the precipitated proteins. The supernatant was collected and dried under a nitrogen gas flow at 60°C. The derivatization step was performed dissolving the dried extract in 200 µL of a freshly prepared butanol solution containing 5% (v/v) acetyl chloride and kept at 60°C for 20 minutes. The solvent was removed by evaporation under nitrogen flow at 60°C. The derivatized samples were dissolved in 100 µL of water-methanol (90:10, v/v) containing 0.1% (v/v) formic acid and 40 µL was injected into the ultra pressure liquid chromatography (UPLC) analytical column.

Results: Serum symmetric dimethylarginine (SDMA) levels (0.33 ±0.07 µmol/L vs 0.22±0.04 µmol/L, p<0.001) were found to be statistically higher in welders compared to controls.

Conclusions: This result suggest that some of the oxidative stress-producing molecules may suppress the activity of the dimethylarginine dimethylaminohydrolase (DDAH) enzyme that metabolizes SDMA. Serum symmetric dimethylarginine levels might be in a relation with cardiovascular effects of manganese exposure.

Keywords : Symmetric dimethylarginine, Manganese toxicity, Cardiovascular risk, Welder

Therapeutic Drug Monitoring and Toxicology

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Abstract Reference : 97

Interest Of Drug Screening In Aeronautical Field

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Aim: Drug addiction is rising in Tunisia especially after revolution, affecting younger people, easy prey to temptation. It constitutes a reel preoccupation in aeronautical medicine because of the possible danger that it can generate on passengers safety. Tunisian pilots undergo drug testing during admission and periodic visits.

In our work, we tacked stock of the current toxicological situation, often unknown, among civilian Tunisian air navigators.

Materials and Methods: We conducted a retrospective study over 12 months (year 2017) involving 544 civil pilots divided as follow: 72 pilot candidates (CPN), 375 pilot students (EPN) and 97 pilots (P) aged lower than 35 years. This population benefited from an urinary drug screening: 4 parameters in revisional visits for EPN and P: Cannabis (THC), Cocaine (COC), Morphine (MOP), Ecstasy (MDMA) and 10 parameters for CPN in admission including in addition: Amphetamines (AMP), Benzodiazepines (BZO), Barbiturates (BAR), Tricyclic-Anti-depressors (TCA), Methadone (MTD) and Buprenorphine (Bup).

Urinary drug screening was realized by rapid test devices based on an immune-chromatographic-technique. Positives or doubtful tests were confirmed by a semi-quantitative dosage (COBAS INTEGRA), positive threshold was 20ng/ml for THC and 300ng/ml for COC.

Results:Seven positives cases (1, 28%) were detected (1 CPN and 6 EPN): 1 case of THC, 3 cases of COC, 2 cases of MOP and one case of BZO, the average age was 28,14ans (18-33ans).

Three cases (1 THC and 2 COC) were declared definitely unable to fly after confirmation, whereas one doubtful case of COC, negative by confirmatory test, was considered after negative control able to fly. MOP or BZO cases were consuming medication (Klipal, Librax) and benefited from their ability to fly after negative controls.

Conclusion: Drug screening among pilots is essential and of major interest hence it guides expert decision on flight ability preventing thereby possible catastrophic incident. It is a delicate topic requiring the mobilization of adequate diagnostic tools and an updating and precision of the legal texts.

Keywords : Drug screening- Pilots- Tunisia- flight ability

Comparison Of Immunochemistry Method For Determination Of Carbamazepine Concentration With Liquid Chromatography Tandem Mass Spectrometry Method

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Background-Aim: Carbamazepine is an anticonvulsant used in the treatment of epilepsy. It metabolizes into the carbamazepine-10,11-epoxide that has pharmacological effect similar to carbamazepine. Comedication and several pathophysiological conditions affect metabolism of carbamazepine. Routine monitoring of carbamazepine concentrations is recommended and is carried out by immunoassays and by chromatographic methods. These techniques differ in many aspects.

The aims of this study were: I) to assess the effect of comedication on percentage of epoxide metabolite; II) to compare the chemiluminescent microparticle immunoassay (CMIA) for determination of carbamazepine concentrations with the liquid chromatography-tandem mass spectrometry (LC-MS/MS) method.

Materials and Methods: This study comprised of 54 patients with a median age 30 years (range 10-74) referred to the Institute of Clinical Laboratory Diagnostics, Osijek University Hospital for carbamazepine monitoring. Venous blood samples were taken in fasting state, before taking the next dose of the drug, using a 6 ml tube containing a clot activator (Becton-Dickinson, Franklin Laes, NJ, USA, Ref 368815). Serum samples were analyzed using the CMIA on the Arhitect i1000_{SR} (Abbott Laboratories, Lake Forest, USA) analyzer and by chromatographic technique using LCMS/MS-8040 (Shimadzu, Kyoto, Japan) analyzer. Informations about patient's comedication were collected. Statistical analysis was performed using MedCalc for Windows, version 12.4.0.0. (MedCalc Software, Marikerke, Belgium). The t-test test was performed for group comparisons (35 patient with comedication vs 19 patients who received only carbamazepine). Passing-Bablok regression analysis and Bland-Altman analysis were performed for methods comparison. P=0.05 was considered statistically significant.

Results: The average level of carbamazepine-10,11-epoxide in patients with comedication was 14 %, while in patients who received only carbamazepine was 12%. Statistically significant difference in epoxide percentages between those groups was obtained using t-test (P=0.020; 95%CI -5.14 to -0.46). Passing-Bablok regression analysis showed proportional differences between the measured values obtained by two methods [$y = -0.52(95\%CI -2.59 - 1.57) + 0.89(95\%CI 0.82 - 0.98)x$]. The results of the Cusum test show no significant deviation from linearity (P=0.92). Bland and Altman analysis showed that all measurement results, except one, were within the ± 1.96 SD range. The mean difference between the two measurements was $3.5 \pm 1.41 \mu\text{mol/L}$. Results of carbamazepine concentrations measured by LCMS/MS were higher than those obtained with the CMIA method.

Conclusion: Comparison study showed that CMIA on Arhitect i1000_{SR} and LCMS/MS method cannot be used interchangeably. Comedication influences the epoxide percentage, so it's monitoring along the carbamazepine is useful in such patients. LCMS/MS is preferred method in such cases since it fulfills the requirements for epoxide measurement. However, the simplicity of analysis performing and the ability of performing random access testing using CMIA on Arhitect i1000_{SR} are advantages over LCMS/MS method which makes it suitable for urgent diagnostics.

Keywords : carbamazepine, carbamazepine-10,11-epoxide, immunoassay, LCMS/MS

Therapeutic Drug Monitoring and Toxicology

Status : Accepted - Poster Presentation

P-194

Abstract Reference : 210

The Performance evaluation of Snibe Maglumi 4000P for therapeutic drug monitoring – Cyclosporine and Tacrolimus-

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Aim: The monitoring of immunosuppressive drugs is essential for successful organ transplantation. In this study, the purpose was to evaluate the analytical performance of Maglumi 4000P in the assessment of cyclosporine and tacrolimus, and to compare with the results of Thermo Scientific Indiko Plus.

Material-Method: Fifty-two patients who admitted to Istanbul Faculty of Medicine Central Laboratory for therapeutic drug monitoring were included in the study. The cyclosporine, and tacrolimus results obtained from Snibe Maglumi 4000P were compared with the results of Thermo Scientific which is currently installed in our laboratory. While Maglumi 4000P is using chemiluminescence method for drug analysis, Thermo Scientific uses immuno turbidimetric methods. The Clinical Laboratory Standards Institute guidelines were performed for analytical evaluation studies.

Results: The inter-assay and intra-assay precision results of Maglumi 4000P for cyclosporine and tacrolimus were found between 1.1% to 4.5%. Carry-over results were minimal, and comparison results of the Maglumi 4000P and Thermo Scientific for both tests showed good agreement with a considerable bias, and gave the following results; for cyclosporine, $y=10.0485 + 1.0892x$, mean bias: -16.8; for tacrolimus, $y=-2.6913+ 1.2653x$, mean bias: 12.7.

Conclusion: Our results demonstrated good agreement with a significant bias between the two analyzers for both immunosuppressive drugs. The results of cyclosporine and tacrolimus obtained from the Maglumi 4000P should be interpreted with clinical relevance and accordingly reported.

Keywords : Maglumi 4000P, Thermo Scientific Indiko Plus, Analytical performance, Cyclosporine, Tacrolimus

Therapeutic Drug Monitoring and Toxicology

Status : Accepted - Poster Presentation

P-195

Abstract Reference : 428

The Calcium Oxalate Crystals In Urine Of Drug Abusers

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Aim: The drug abuse is a phenomenon that is very common among young people. The medical complications of drug abuse have become increasingly apparent and these include many of urological complications. The aim of this study is to detect the presence of crystals in the urine and to anticipate the formation of kidney stones in drug abuse.

Materials and Methods: Urine analysis of drug abusers, between 18-65 years old and applied to Psychiatry Clinic of Pamukkale University Hospital, was retrospectively examined between January 2017 and March 2018. The urine results of 551 drug abusers and 564 individuals known to not use drug were

evaluated. The level of amphetamines, benzodiazepines, cocaine or metabolites, opiates and cannabinoids in urine detected on otoanalyzer (Roche Cobas 6000 c702 Modular Analyzer, Mannheim Germany) with photometric method. Microscopic urinalysis, analyzed on an Iris Diagnostic IQ200 instrument with laminar flow digital imaging technology, was examined for crystals. "SPSS 20.0 for Windows" (SPSS Inc., IL, USA) program was used for recording data and statistical evaluations.

Results: Opiates, benzodiazepines, amphetamines, cannabinoids and cocaine or metabolites positive results were 198 (35.9%), 152 (27.5%), 123 (22.3%), 67 (12.1%), 11 (1.9%), in all the drug abusers, respectively. While the calcium oxalate crystals were positive in 5 of the control patients (0.8%), were positive in spot urine of 118 drug abusers (%21,4) ($p < 0.001$). The incidence of calcium oxalate crystals in urine were 43 (36%), 32 (27.1%), 28 (23.7 %), 12 (10.1%), 3 (2.5 %) respectively, for opiates, benzodiazepines, amphetamines, cannabinoids and cocaine abusers.

Conclusions: The calcium oxalate crystals are frequently seems in in urine of drug abusers. The reason for the formation of calcium oxalate crystals in the urine may be unbalanced nutrition in drug abusers. By early diagnosis of these patients, kidney stone problems can be prevented.

Keywords : calcium oxalate crystals, drug abuser

Therapeutic Drug Monitoring and Toxicology

Status : Accepted - Poster Presentation

P-196

Abstract Reference : 296

Pharmacokinetics Of Methotrexat In Patients With Renal Insufficiency

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Background: Methotrexate (MTX), in low dose is one of the most frequently used antirheumatic drugs in patients with rheumatoid arthritis (RA), because of its benefit and risk profile. Glomerular filtration is the dominant pathway of MTX elimination. Our study wants to determine the effects of impaired renal function on the pharmacokinetics of MTX in RA patients and possible hepatotoxicity. Methods: 38 RA patients were included in this study. MTX was administered intramuscularly (7.5-15mg). Subjects were divided into three groups, according to their creatinine clearance (CLCR); group 1: CLCR lower than 45 ml/min; group 2: CLCR between 45 and 80 ml/min and group 3: CLCR higher than 80 ml/min. Blood samples were collected from each subject, 2, 12 and 24 hours after drug administration. We determined concentrations of MTX and transaminase liver enzymes. Results: MTX concentrations were 1.2 to 1.5-times higher in group 1 than in groups 2 and 3. Total MTX t_{1/2} eliminations were 23h in group 1, 12.8 hours in group 2 and 10.5 hours in group 3. Linear regression revealed good correlations between clearance values of MTX and creatinine clearance. Elevated ALT/AST levels occurred in 30% patients, 12 hours after MTX therapy in group 1, 10% and 7% of patients in group 2 and 3. Highest level of ALT is 96 IU/L, AST 62 IU/L. Conclusions: Eliminations half life was significantly increased and total clearance was significantly reduced with the degree of renal impairment. Longer elimination half life induced increased chance of liver dysfunction.

Keywords : methotrexat, renal insufficiency

Evaluation Of Measurement Uncertainty And Test Performance In Drug Substance Analyzes

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Aim: Measurement uncertainty is a parameter that must be given together with any measurement result in the patient report, it reflects the limits of the actual measurement value and the confidence level. We want to determine uncertainty for kannabinol test, which we mostly report on top of the threshold,

Materials and Methods: The samples selected in this study were positive samples according to threshold value 50 ng / ml for the 11 nor delta 9 THC -9-COOH test among the stored urine samples in İzmir Katip Çelebi University Atatürk Training and Research Hospital Medical Biochemistry laboratory and also negative samples. All sample selected randomly from within the last six months. Urine creatinine value was considered to be between 20-300 mg / dl.

When the methods used in various researches for the measurement uncertainty were analyzed, it was seen that different approaches exist. Among these, the most easily understandable method was the conclusion that the precision value obtained from the internal quality control results is% CV values and the bias value obtained from external quality control reports is% bias values, as suggested in the Nordest guide.

First, combined uncertainty and extended uncertainty were obtained after calculating the uncertainty values, the patients studied with the calculated extended uncertainties were re-examined.

Our samples which were positive according to our initial studies were frozen at -80 ° C, then our uncertainty was calculated, the samples to be recalculated according to this value and the chromatographic data were selected and solved in the same conditions and analyzed once again on the same day and same working set.

Results: According to the results of these analyzes, 19 samples were reported above the first study outcome threshold value, but were found to be at the threshold value again on the collective study day after being solved.

In other words, four samples values below the threshold in the first study were found to be above the threshold on the collective working day. So there was a doubt that it was given as false negative.

Conclusion: The use of measurement uncertainty allow the laboratory 'responsibilities for analytes. And this is help of decision-making, especially in drug analysis for administrative restriction.

On the other side knowing the value of the uncertainty will help laboratory and the clinician to identify that which samples should be send to the validation analysis

Keywords : drug abuse, tetrahidrokannabinol, measurement uncertainty

Allergy and Immunology

Status : Accepted - Oral Presentation

P-198

Abstract Reference : 339

Stability of samples from HIV patients for immunophenotyping

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Aims: T lymphocytes play important role in acquired cellular immunity and constitute the majority of the circulating lymphocytes (about 80%). T lymphocytes have two main subtypes; Killer (cytotoxic) T lymphocytes (CD8 positive) and helper T lymphocytes (CD4 positive) Normally the CD4 / CD8 ratio is 1.5 / 1. This is followed by the progression of immunologically related diseases. Flow cytometry analysis is a widely used method for immunophenotyping. The aim of this study is to investigate the inter-day variation of flow cytometric measurements of total CD3, CD4 and CD8 T cells.

Materials and Methods: Fifteen patients with human immunodeficiency virus (HIV) virus infection who were being followed in our clinic for infectious diseases were included in the study. Venous blood samples were collected into vacutainer test tubes containing EDTA. First immunophenotyping analyses were performed on the day of samples collection. Samples were kept +4 degrees and the analyses were repeated after 5 days. Flow cytometric analyses were performed in accordance with manufacturer's instructions. The samples were incubated in the dark at room temperature for 20 minutes, analyzed using flow cytometer (Beckman Coulter Navios) Statistical significance level was determined as 0.05. Analyzes were performed using the MedCalc Statistical Software version 12.7.7 (MedCalc Software, Belgium).

Results: Lymphocyte, CD3, CD4, CD8 levels between Day 0 and Day 5 did not differ statistically ($p>0.975$, respectively; 0.124; 0.875; 0.469). Monocyte measurements were significantly different between days ($p<0.010$).

Conclusion: According to the results of the study, blood specimens stored at +4 can be measured for T lymphocytes and subgroups, but sample proceeding and analysis on the day of samples collection is preferred. Differences in the monocyte percent may be related to decreasing of the total cell percent according to cell death through the 5 day.

Keywords : lymphocytes

Endocrinology and Metabolism

Status : Accepted - Poster Presentation

P-199

Abstract Reference : 360

Diagnostic Performance of HbA1c For Detecting Prediabetes and Diabetes

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Background: Oral glucose tolerance test (OGTT) is a traditional diagnostic tool for diabetes. Hemoglobin A1c (HbA1c) is a recently recommended test for diagnosis. We evaluated the diagnostic performance of HbA1c and determined optimal cutoff points for detecting prediabetes and diabetes.

Methods: This retrospective study included 1099 patients: 160 males (14.6%) and 939 females (85.4%) who had undergone simultaneous OGTT and HbA1c testing at our institute between 2014 and 2018. Subjects were diagnosed with diabetes (fasting glucose ≥ 7.0 PubMed mmol/L; 2-h plasma glucose (2-h PG) ≥ 11.1 mmol/L) or prediabetes (fasting glucose 5.6–6.9 mmol/L; 2-h PG; 7.8–11.0 mmol/L). The diagnostic performance of HbA1c for prediabetes and diabetes was determined using the area under the receiver operating characteristic curve (AUC).

Results: At diagnosis, 725 (65.9%) subjects had normoglycemia, 309 (28.1%) had prediabetes, and 65 (5.9%) had diabetes. The kappa coefficient for agreement between OGTT and HbA1c was 0.414. The optimal HbA1c cutoff points were 35.5 (AUC, 0.894(0.874-0.911 CI), with a sensitivity of 92.31% and a specificity of 69.63% for diabetes and 35.5 mmol/mol (AUC, 0.668 (0.638-0.697CI) with a sensitivity of 49.51% and a specificity of 77.79% for prediabetes. Positive predictive value (PPV) and negative predictive values (NPV) of a HbA1c of ≥ 47.5 PubMed mmol/mol to diagnose diabetes were 88.42% and 89.07% and for HbA1c of ≥ 38.8 PubMed mmol/mol to diagnose prediabetes were 19.8% and 94.5% respectively.

Conclusion: In conclusion, use of HbA1c criteria for diagnosis of prediabetes and diabetes remains controversial, owing to disparities between the results of OGTT and HbA1c-based tests. The recommended cut offs for HbA1c as a diagnostic test should be reconsidered.

Keywords : Keywords : Diabetes Mellitus, Diagnosis, Glucose Tolerance Test, Glycated Hemoglobin A

Endocrinology and Metabolism

Status : Accepted -Poster Presentation

P-200

Abstract Reference : 294

Serum Neutrophil Gelatinase-Associated Lipocalin levels in neovascularization

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Aim: Neutrophil gelatinase-associated lipocalin (NGAL) has been reported to be involved in biological functions such as apoptosis, the innate immune response, and impaired glucose metabolism. The aging of the vascular system includes age-related changes in the microcirculation, loss of vein structural integrity and gradual development of endothelial dysfunction. We aimed to investigate serum glycated serum protein (GSP) and NGAL levels in diabetic retinopathy (DRP) or wet type age-related macula degeneration (AMD), in accordance with laboratory and clinical findings.

Materials and Methods: Cases were investigated in four groups; group 1: healthy individuals (N=37); group 2: diabetics without DRP (N=40); group 3: diabetics with DRP (N=40); group 4: patients with wet type AMD (N=40). Serum samples were stored at -80°C. In addition to the routine biochemistry tests, serum levels of GSP (Diazyme Laboratories, USA) and NGAL (BioPorto, Denmark) were measured by immunoturbidimetric method via AU 5800 (Beckman Coulter Inc., USA).

Results: Although we found statistically no difference in NGAL among all groups (p=0.427), the values seemed lower in both group 3 and group 4. NGAL levels (ng/mL) were as follows; group 1: 138.7 (105.4-178.6), group 2: 127.4 (102.7-151.0), group 3: 120.5 (81.1-158.1), group 4: 122.9 (101.5-160.1). Also there was no difference in GSP between group 1 and group 4. There were significant differences among

the groups in white blood cells ($p=0.016$), neutrophils ($p<0.010$), lymphocytes ($p=0.032$), and GSP levels ($p<0.0001$).

Conclusion: In contrast to our findings, increased serum levels of NGAL were reported in DRP. It was also found decreased in aqueous humor samples after neovascular therapy in AMD. We used GSP levels to show diabetic status of the groups, but found no difference in serum NGAL levels in DRP or AMD.

Keywords: Neutrophil Gelatinase-Associated Lipocalin, neovascularization, age related macula degeneration, diabetic retinopathy.

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-201

Abstract Reference : 30

Evaluation of the Agreement Between “Twin Analyzers” Located In Same Laboratory Environment

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Background: To cope with the increasing number of tests in high-volume laboratories, it is necessary to have more than one autoanalyzer. Since follow-up tests may ordered even in the same day from a patient, samples accepted at different times can measured on any of these analyzers. The aim of the study was to evaluate agreement between analyzers in terms of intra-individual biological variation (CVI) by using internal quality control (IQC) data.

Methods: Creatinine analyses were made by Jaffe kinetic method on two separate AU640 analyzers where located in same laboratory environment. Two different levels of IQC materials (Beckman Coulter Control Serum 1 (IQCL1) and 2 (IQCL2)) were prepared and analyzed in the beginning of each running day at almost same time by the same technician in each device. TE was determined as follows: “ $TE=bias+1.65.SD$ ”. To evaluate agreement between analyzers, concordance correlation coefficient (ρ_c) was calculated (MedCalc Inc; USA). The bias values calculated from a year IQC data were displayed as exponentially weighted moving average (EWMA) chart by using Minitab software (Minitab Inc., USA). EWMA chart was updated according to creatinine CVI value (5.95%).

Results: CV%^s of creatinine for IQCL1 and IQCL2 were 3.0 and 2.1 in both analyzers, respectively. TEs of analyzer-A and -B were calculated as 8.7% and 10.1%, respectively and both were within TE_a limits according to CLIA (15%). The ρ_c value was 0.998 (95% CI: 0.997-0.998). EWMA chart showed that even in the case of high agreement between two analyzers, bias over the CVI might still occur.

Conclusion: Using EWMA-like quality control charts might be useful to show the possibility of a laboratory-based error that may adversely affect the patients before it emerges, especially in tests that require follow-up in case of having multiple analyzers perform the same analysis.

Keywords : agreement, concordance correlation, EWMA, internal quality control

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-202

Abstract Reference : 5

Evaluation Of The Analytical Process On Tumour Markers By Using Six Sigma Methodology

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Aim: Tumour markers are widely used following the treatment of cancer patients, and reliable laboratory results are important in patient management. Six Sigma methodology is a quality measurement method to evaluate laboratory performance. The analytical performance of our laboratory was analyzed using internal quality control data of tumour markers and by calculating process sigma values.

Materials and Methods: Total allowable error values were obtained from published studies. Sigma values were calculated from the coefficient of variation (CV) and the bias resulting from the Internal Quality Control (IQC) outcomes for three consecutive months. Quality was assessed on the sigma scale using a benchmark for minimum process performance of 3 sigma as 'unacceptable', between 3 and 6 sigma as 'good', and 6 sigma as a goal for 'world-class' quality. Both normal (IQC1) and pathological (IQC2) levels of IQC materials were assayed for each parameter.

Results: A sigma value >6 was found for carbohydrate antigen 19-9 (CA 19-9) for the IQC1 for 3 months. IQC2 sigma values for CA19-9 and *carcinoembryonic antigen (CEA)* were found to be >6 sigma only for November. When the sigma values were analyzed by calculating the mean of IQC1, carbohydrate antigen 125 (CA-125), and carbohydrate antigen 15-3 (CA 15-3), in October; CA-125, CA 15-3, CEA in November and CA-125 in December were found between 3 and 6 sigma. CA19-9 in October and CA-125 in November were found between 3 and 6 sigma of IQC2. However, alpha fetoprotein (AFP) produced sigma values <3 for three consecutive months.

Conclusion: The analytical performance of tumour markers was evaluated according to Six Sigma levels. Some markers were evaluated as acceptable. Based on the results of these evaluations, improvement studies should to be performed by evaluating the external quality results of the unacceptable tests.

Keywords : Tumour markers; six sigma; coefficient of variance; bias; total allowable error

Laboratory Management and Quality Control

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P-203

Abstract Reference : 11

Evaluation of uncertainty for pancreatic amylase and lipase

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Aim: Pancreatic alpha-amylase and lipase assays are suitable for monitoring acute pancreatitis and acute attacks during chronic pancreatitis. In this study, uncertainty of Pancreatic alpha-amylase and lipase were calculated for give true value interval of these parameters to clinicians.

Materials and Methods: Pancreatic alpha-amylase and lipase activities were analyzed enzymatic colorimetric method with Beckman Coulter AU 5800. Long term internal quality control (IQC) data at two levels as normal and high were used for the evaluation of within-laboratory reproducibility (n=117 for pancreatic alpha-amylase; n=118 for lipase). Five-shipment external quality assessment (EQA) data were used for the evaluation of bias (September 2017 to January 2018). Uncertainty of reagent, calibrator

and calibrator slipping were added and expanded uncertainty (Ue) was calculated for pancreatic alpha-amylase and lipase according to Guide to the Expression of Uncertainty of Measurement and Eurachem guidelines. The level of IQC normal and high were 89,5 and 252 for pancreatic alpha-amylase. While the level of IQC normal was 63,7 and IQC high was 171 for lipase.

Results: Ue=15.32% for IQC normal level (pancreatic alpha-amylase). Ue=15.82% for IQC high level (pancreatic alpha-amylase). Ue=24% for IQC normal level (lipase). Ue=25.24% for IQC high level (lipase).

Conclusion: The dispersions of results could add the laboratory test reports through calculation uncertainty of pancreatic alpha-amylase and lipase. We believe that it will be useful for clinicians especially at diagnostic levels to manage the pancreatic diseases.

Keywords : Pancreatic amylase; lipase; uncertainty; internal quality control; external quality control

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-204

Abstract Reference : 297

Condition Assessment Study For More Effective Medical Biochemistry Education

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Aim: The medical biochemistry lectures are processed within the first 3 years of the whole period of our University's faculty of medicine. On the other hand, regarding to our opinion, it will be more effective if the relations between diseases and biochemistry are reviewed once again during the clinical rotation period in the medical education. The survey which includes questions about the relations with preanalytic phase, diseases and biochemistry is aimed to be carried out in the group of the students who has his own specialization in different clinics in our hospital in order to be able to determine the requirements about this topic.

Materials and Methods: The study designed as a cross-sectional. Data collection instrument prepared by the researchers themselves. The instrument included 24 items and multiple choice options. The data collected from the specialization students were entered into a standard data base by the researchers. The questionnaire has been directed into 33 Family Practice specialization student, 20 Emergency Medical Service specialization student, 11 General Surgery Service specialization student in Izmir Katip Celebi University Atatürk Education and Research Hospital. For the analysis of the study data, descriptives statistics, Student t-test, One-way ANOVA were used. Data analysis performed using PASW statistics for Windows (SPSS, Inc. IBM) version 21.0.

Results: The half of the participants don't have the knowledge related with the required sample type of the coagulation correctly. The same amount of the participants don't have the correct knowledge that how much the blood glucose unit would be reduced if the sample is made to be hold on in non-centrifuged status either. The urine collection method of 24 hours and urine sample type for special analysis couldn't be known by the students in Family Practice Service. %33 of the attendees couldn't determine the correct tube for blood drawing process, especially the analysis for erythrocyte sedimentation rate and coagulation. Thus, it can be seen that if they carry out the blood drawing and examination of the patients processes on their own, the samples will be rejected directly by the laboratory. %40 of the students couldn't determine the correct tumor claim in different type of cancer. %50 of the students didn't have the knowledge about the blood sample should be drawn from mother in order to carry out the prenatal analysis. There was no %50 awareness about the change of sodium, potassium and calcium ranges in the blood samples drawn into EDTA tube. %45 of the students didn't have the awareness about the mistakes

which takes place at pre-analysis phase that causes the greatest reason of the faulty outcomes or rejection of the samples.

Conclusion: In order to be able to enable the correct examination process, to minimize the preanalytic failure range, to evaluate the analysis outcomes more accurate after the graduation period, it will be very effective if the medical biochemistry education is added into the rotation programme before the graduation. It is so important that this training should be carried out practically such as; the students should examine the patients and ask for the analysis in addition to this, biochemistry lecturers and clinicians should collaborate more than ever to detect the missing parts of this training programme.

Keywords : medical biochemistry education, awareness of preanalytical error

Neurology and Neurodegenerative Diseases

Status : Accepted - Poster Presentation

P-205

Abstract Reference : 343

Levels Of Interleukins In The Serum Of Patients With Or At Risk Of Alzheimer's Disease.

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Aim: Alzheimer's disease (AD) is the most common multifactorial neurodegenerative disorder which is the main cause of dementia and it is characterized by a progressive loss of memory and executive function. To date, there are no definitive diagnostic tests that can predict or assess onset and progression of AD. This study aimed to identify alterations of interleukins in AD and in conditions at risk of AD.

Materials and Methods: we evaluated the serum levels of different interleukins (IL)-1 family members and their inhibitory mediators in patients with AD, mild cognitive impairment (MCI), subjective memory complaints (SMC) and healthy subjects (HS). Two hundred and forty participants were divided into four groups: 60 individuals with probable AD, 45 with MCI, 61 with SMC and 74 HS. The cytokines of the IL-1 family (IL-1 α , IL-1 β , IL-33, IL-18), their soluble receptors (sIL-1R1, sIL-1R2, sIL-1R3, ST2 / sIL-1R4) and the antagonists (IL-1Ra and IL-18BP) were measured in the serum of all subjects by ELISA test. The differences between the 4 study groups were assessed by uni- and multivariate analysis of covariance (ANCOVA) using as covariates: age, sex, education, body mass index, comorbidity and drug therapy. For the multiple comparisons was used Bonferroni's correction.

Results: results of the experiments showed no significant differences between groups with respect to IL-1 α (p = 0.666), IL-1 β (p = 0.324), IL-18 (p = 0.163) and IL-33 (p = 0.255) levels. For the remaining inflammatory mediators, the differences were highly significant (p <0.001), except for IL-1Ra (p = 0.022). Multiple comparisons revealed that the levels of soluble receptors in the IL-1 family were significantly increased in AD patients compared to the other groups (MCI, SMC and HS), with the exception of sIL-R2 increased in MCI subjects in relation to the other groups (p <0.001).

Conclusion: the finding of the present study could be useful to better understand the role of inflammation in the development of AD and in the identification of biomarkers for early diagnosis in the subjects at risk.

Keywords : Alzheimer's disease, interleukins, biomarkers

Laboratory Management and Quality Control

Status : Accepted - Poster Presentation

P-206

Abstract Reference : 363

An Example Of A Scale Study About The Preanalytical Period: How Much Do Our Staffs Know?

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Aim: Laboratory results have a crucial role in clinical decision. At the same time, incorrect laboratory results are also an important source of medical errors. Several studies have shown that more than 70% of the laboratory errors are due to preanalytical faults. In this study, it was aimed to determine whether the staffs are lacking information about the preanalytical process and to raise awareness about this period in our hospital. At the same time, creating a scale that measures the knowledge of healthcare personnel about preanalytical period, reveals the need for education, and evaluates the effectiveness of preanalytical training was aimed.

Materials and Methods: The scale was generated from twenty short and clear questions. It included true/false provisions that covering pre-analytic factors such as blood/urine sampling procedure, transportation of the samples, fasting and use of drugs. The scale questions were applied to the volunteers working in ESOGU Medical Faculty Hospital who were responsible for taking blood / other laboratory samples from the patients and the technicians working in the laboratory. After the questionnaire was applied, an education was given at the hospital. The same scale was repeated to a group of trained volunteers. The total scores of the volunteers were calculated according to their correct answers and evaluated using the SPSS 20.0 program.

Results: A total of 249 volunteers (195 females, 54 males) participated in the study (141 nurses, 49 intern doctors, 22 intern nurses, 9 assistant doctors and 28 laboratory technicians). 81 of the participants were from internal medicine, 52 were from surgical units, 34 were from intensive care unit, 24 were from emergency unit and 30 were from central blood sampling unite. Before the education participant responded correctly to 67.3% of questions (min: 25% -max: 100%). The highest mistake rate was observed in the question related to the conditions of sample storage (right answer ratio: 21.3%). Total score of laboratory technicians was higher than all other units ($p < 0.001$). There was no difference between genders, occupations (except laboratory technicians) and different hospital units in terms of total scores ($p > 0.05$). After the training the total score of nurses increased significantly ($p < 0.001$). Total score did not correlate with age and seniority in any occupation group ($p > 0.05$). The Cronbach's alpha reliability coefficient of the scale was found 0.66.

Conclusion: With the scale applied in our study, it became clear which topics needed to be focused on during the preanalytical training in our hospital. Such scales can be used regularly to decide how often the sampling units should be trained about the preanalytical period.

Keywords: preanalytical errors, preanalytical period scale, preanalytical survey, preanalytical questionnaire

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