Cardiovascular disease

Cod: 0302

LEPTIN, FREE FATTY ACIDS AND INSULIN RESISTANCE MARKERS IN MYOCARDIAL INFARCTION

O. Gruzdeva[1], E. Uchasova[1], Y. Dyleva[1], E. Belik[1], E. Shurygina[1], V. Karetnikova[1], O. Barbarash[1]
[1]*Research Institute for Complex Issues of Cardiovascular Diseases under the Siberian Branch of the Russian Academy of Medical Sciences, Kemerovo, Russia*

BACKGROUND: The role of leptin, the adipokine, which has an important role in maintaining energy and metabolic homeostasis in myocardial infarction (MI) and its complications, has been of great interest.

METHODS: 95 patients with MI (group 1) and 60 patients (group 2) with MI and associated T2DM were included in the study; the control group consisted of 30 healthy subjects. Serum glucose, leptin, free fatty acids (FFA), C-peptide and insulin levels were measured on the 1st and 12th days of the study. MI was diagnosed according to the 2007 National Scientific Cardiology Society. The study design was approved by the Institutional Review Board. The statistical analysis was performed using Statistica 6.1.

RESULTS: Blood glucose level increased in the group 1 and on the 1st day after myocardial infarction onset. An elevation of glucose level was noticed in the group 2 during the whole follow-up period. Fasting serum insulin and C-peptide level tended to increase in both groups on the 1st and 12th days. At day 1 FFA concentrations in the both group patients were 7- and 11-fold higher than those in the controls. By day 12 FFA levels decreased but were still 3.0- and 4.7-fold higher than those in the controls. The both groups had increased leptin concentrations both at day 1 and 12 as compared to the healthy subjects, the group 2 had higher leptin concentrations during the entire hospital stay. The correlation analysis showed that the both patient groups had positive correlations between leptin concentrations and FFA levels (R=0.38 p=0.0001 group 1, and R=0.46 p=0.01 group 2); leptin concentrations and basal insulin levels (R=0.4 p=0.0001 group 1, and R=0.52 p=0.03 group 2).

CONCLUSIONS: Apparently, leptin can be regarded as an additional IR marker in MI and one of the important links in the chain of lipid and glucose metabolic derangements, which accompany acute coronary events. This field of study is promising because the obtained data can form a basis for new diagnostic and therapeutic strategies of metabolic derangements correction in coronary disease patients.

Cardiovascular disease

Cod: 0303

THE QUALITY OF LABORATORY ASPECTS OF TROPONIN TESTING IN CLINICAL PRACTICE GUIDELINES AND CONSENSUS DOCUMENTS NEEDS TO BE IMPROVED

K.M. Aakre[6], M.R. Langlois [2], J.H. Barth[1], S. Misra[3], J. Watine[4], W.P. Oosterhuis[5]

[1]*The European Federation of Clinical Chemistry and Laboratory Medicine and European Union of Medical Specialists joint working group on Guidelines and Clinical Blood Sciences, St George's Hospital, London*

[2]*The European Federation of Clinical Chemistry and Laboratory Medicine and European Union of Medical Specialists joint working group on Guidelines and Department of Laboratory Medicine, AZ St-Jan Hospital, Bruges*

[3]*The European Federation of Clinical Chemistry and Laboratory Medicine and European Union of Medical Specialists joint working group on Guidelines and Diabetes, Endorcinology & Metabolism, St Mary's Hospital, Imperial College London*

[4]*The European Federation of Clinical Chemistry and Laboratory Medicine and European Union of Medical Specialists joint working group on Guidelines and Laboratoire de Biologie Polyvalente, Hôpital de la Chartreuse, Villefranche-de-Rouergue*

[5]*The European Federation of Clinical Chemistry and Laboratory Medicine and European Union of Medical Specialists joint working group on Guidelines andDepartment of Clinical Chemistry, Atrium Medical Centre, Heerlen*

[6]*The European Federation of Clinical Chemistry and Laboratory Medicine and European Union of Medical Specialists joint working group on Guidelines andLaboratory of Clinical Biochemistry, Haukeland University Hospital, Bergen*

BACKGROUND: The European Federation of Laboratory Medicine (EFLM) and the Union of European Medical Specialists (UEMS) joint Working Group on guidelines recently published a propose checklist to help standardize the description of laboratory investigations in clinical practice guidelines (CPG).

METHODS: CPGs or consensus documents published from 2011 to 2013 describing the investigation of chest pain, diagnosis of acute coronary syndrome (ACS), or MI were considered for inclusion in the study, by searching PubMed and a guideline database (National Guideline Clearinghouse). These were evaluated against the published checklist for the ideal description of tests in CPGs.

RESULTS: Nine publications were included. Information relating to the use of troponin was frequent, including; for which specific condition the test should be used; frequency of testing; the time frame between clinical event and testing, and the diagnostic cut off applicable (7 publications suggested the 99th percentile). Five publications gave some information about desirable analytical variation (CVa), i.e. 10% at the 99th percentile. Even though 6/9 documents suggested that the diagnosis of ACS was based upon sequential changes in troponin results, only the ESC consensus document quantified these changes; if the baseline sample is < Upper reference limit (URL), then a clinically significant change should be defined as >50%, whereas if the initial value is > URL, then a >20% rise is appropriate. Non-ACS causes of troponin elevation, e.g. acute illness, acute phase reaction and some medications were frequently mentioned in contrast to elevations related to physical activity. Information about well-known analytical interferences (e.g. hemolysis and heterophilic antibodies), the use of internal or external quality assurance, age and gender differences, were rarely addressed.

CONCLUSIONS: CPGs and consensus documents regarding the clinical use of troponin analysis present variable, vague and sometimes conflicting information. Most of the laboratory related items are not considered or need to be updated e.g. analytical quality goals are not applicable for the high sensitive assays. A closer cooperation between clinicians and laboratory specialists during guideline development is warranted.

Cardiovascular disease

Cod: 0304

ASSESSMENT OF CYCLOPHILIN A, PENTRAXIN-3, SERUM AMYLOID A AND OXIDIZED-LDL AS POTENTIAL BIOMARKERS IN THE PREDICTION AND PROGRESSION OF CORONARY ATHEROSCLEROSIS

E. Ademoglu[3], U. Ozturk[3], A. Kaya[1], U.Y. Sinan [2], A. Arat-Ozkan[2], T. Gürmen[2]
[1]*Istanbul University, Institute of Cardiology, Biochemistry Laboratory*
[2]*Istanbul University, Institute of Cardiology, Department of Cardiology*
[3]*Istanbul University, Istanbul Faculty of Medicine, Department of Biochemistry*

BACKGROUND: Atherosclerosis is a complex progressive process characterized by abnormal lipid accumulation and inflammatory cell infiltration within the artery wall and it is clinically manifested as coronary artery disease and cerebrovascular disease. Increasing evidence suggests that inflammatory mechanisms play a key role in all stages of the atherosclerotic process. Several inflammatory markers including C-reactive protein (CRP), fibrinogen and inflammatory cytokines have been used to predict the risk of cardiovascular disease or prognosis in patients with atherosclerosis. Recently it has been suggested that some novel biomarkers associated with the atherosclerotic process may have diagnostic and/or prognostic value in cardiovascular diseases.

METHODS: Therefore, we investigated the prognostic and diagnostic value of CRP, oxidized-LDL (oxLDL), serum amiloid A (SAA), pentraxin-3 (PTX3) and cyclophilin A (CypA) in angiographically-defined patients with and without coronary artery disease. Serum oxLDL, PTX3 and CypA levels were measured by an immunoassay based on the sandwich technique, SAA was measured by an immunonephelometric assay.

RESULTS: Our results showed that oxLDL and CyPA levels, oxLDL/LDL and oxLDL/HDL ratio of the patients with coronary artery disease were significantly higher than those without disease. A positive correlation between CyPA and LDL and, a negative correlation CyPA and oxLDL was noted. The logistic regression model predicting coronary artery disease by using age, sex, BMI, smoking, alcohol consumption, serum lipids, CRP, oxLDL, PTX3, SAA and CypA as covariates revealed that the predictors for the coronary artery disease are CyPA and oxLDL.

CONCLUSIONS: We may suggest that CyPA and oxLDL are the predictors of coronary artery disease. Neither PTX3 nor SAA could be potential biomarkers in prediction of coronary artery disease.

Cardiovascular disease

Cod: 0305

LOW LEVEL INFLAMMATORY IMMUNE RESPONSE IN GESTATIONAL DIABETES MELLITUS PATIENTS

Z. Akbulut[4], F.T. Akdeniz[4], H. Sari[3], H. Aydin[1], B. Dalan[5], D. Sit[3], H. Atasoy[4], G. Yanikkaya Demirel[2], T. Isbir[5]
[1]*Endocrinology, Yeditepe University, Medical Faculty*
[2]*Immunology, Yeditepe University, Medical Faculty*
[3]*Internal Medicine, Bagcilar Research Hospital*
[4]*Molecular Medicine, Yeditepe University, Institute of Health Sciences*
[5]*Molecular Medicine, Yeditepe University, Medical Faculty*

BACKGROUND: Atherosclerotic cardiovascular disease is one of the most common complications of diabetes. Women with gestastional diabetes represent a high risk group for type 2 diabetes and for cardiovascular disease in the future. We aimed to evaluate the parameters of inflammation which is associated with atherosclerotic cardiovascular diseases.

METHODS: A total of 49 frozen serum samples of pregnant women with gestastional diabetes and 40 healthy pregnant women were analyzed. Quantitative amounts of inflammation parameters; sCD40L, interleukin 6 (IL-6),interleukin 8 (IL-8), Monocyte chemoattractant protein-1 (MCP-1), sP-selectin, tissue plasminogen activator (t-PA) were determined by using a bead based array and cytometry.

RESULTS: CD40L (26446,6±16559,4 vs. 23570,2±14849,7 ng/ml, p>0,05), MCP-1 (649,9±274,9 vs. 641,20±190 ng/ml, p>0,05), sP-selectin (345,9±144,8 vs. 228,6±68,2 µg/ml, p<0,05), t-PA (1793,8±743,5 vs. 1543,2±556,8 ng/ml, p>0,05) and IL-6 (19,8±6,7 vs. 19,31±8 ng/ml, p>0,05) were higher in pregnant women with gestastional diabetes in comparison to control group. IL-8 levels (99,5±402,3 vs. 17±18 ng/ml, p<0,05) were significantly increased in gestastional diabetes mellitus pregnant women compared with control group.

CONCLUSIONS: High level of IL-8 levels in these patients shows that there is an inflammatory response in gestastional diabetes. CD40L, P-selection, t-PA, IL-6 and MCP-1 levels indicates that there is a low level immune response activation indicating inflammation. These inflammation markers may be interpreted as positive indicators for cardiovascular disease risk in this group of patients.

Cardiovascular disease

Cod: 0306

DIAGNOSTIC ACCURACY OF CYTOKINES FOR PREMATURE CORONARY ARTERY DISEASE

W.M. Ansari[2], D. Khan[1], F.A. KHAN[1]
[1]*Armed Forces Institute of Pathology, Rawalpindi, Pakistan*
[2]*Army Medical College, Rawalpindi, Pakistan*

BACKGROUND: The objective was to evaluate diagnostic accuracy of high sensitivity C-reactive protein (hS-CRP), Interleukin-18 (IL-18), Tumor Necrosis Factor-alpha (TNF-alpha), Interleukin-10 (IL-10) and IL-18/IL-10 ratio for identification of PCAD patients. The diagnostic validation case-control study was conducted at the Clinical Pathology Laboratories of the Army Medical College, Rawalpindi, Pakistan, from October, 2012 to September, 2013.

METHODS: Two hundred subjects aged <45 years scheduled to undergo coronary angiography were consecutively screened. Ninty-eight patients with > 70% stenosis, in atleast one coronary vessel, on angiography were labeled to have PCAD. An equal number of angio-negative subjects were taken as controls. Serum IL-10, IL-18 and TNF-alpha were measured using Enzyme linked Immunosorbent Assay (ELISA), hS-CRP on Immulite 1000 and serum cholesterol, Triglycerides and High Density Lipoprotein (HDL) by colorimetric methods. Statistical analysis was done using SPSS-17 and MedCalc software.

RESULTS: Total 196 subjects consisting of 98 PCAD patients and 98 angio-negative controls participated in the study. Mean ± SD age of PCAD patients was 40.7±4.23yrs (89 males and 9 females) while in controls it was 35.1±7.55yrs (93 males and 5 females). Serum hS-CRP had the highest area under curve (AUC) of 0.936(0.89-0.97) followed by IL-18 0.853(0.79-0.90), TNF-alpha 0.731(0.659-0.796), IL-18/IL-10 ratio 0.667(0.592-0.737) and IL-10 0.574(0.497-0.649) for the diagnosis of PCAD. Sensitivity-specificity of hS-CRP and IL-18 at cut off value of 3.18 pg/ml and 200pg/ml were 86%-91% and 77%-81% respectively. Significant correlation was observed between hS-CRP, IL-18($p<0.01$) and TNF-alpha ($p<0.05$).

CONCLUSIONS: hS-CRP and IL-18 have the best diagnostic potential among the cytokines for detection of PCAD with high sensitivity and specificity.

Cardiovascular disease

Cod: 0307

EVALUATION OF INFLAMMATORY CYTOKINES AND HS-CRP IN PATIENTS WITH CORONARY HEART DISEASES

G. Begolli[3], L. Begolli[2], V. Topçiu Shufta[2], Z. Baruti Gafurri[2], Z. Sllamniku Dalipi[1], S. Thaqi[3]

[1]*Department of Periodontology and Oral Medicine, School of Dentistry, Medical Faculty, University of Prishtina, Prishtina, Kosovo*

[2]*University Clinical Center of Kosovo - Department of Medical Biochemistry, Medical Faculty, University of Prishtina, Prishtina, Kosovo*

[3]*University Clinical Center of Kosovo - Department of Medical Biochemistry, Prishtina, Kosovo*

BACKGROUND: Ischemic heart disease is the most common type of heart disease and cause of heart attacks. The aim of this study was to examine the serum levels of high- sensitivity C reactive protein (hs-CRP), interleukin 1-beta (IL 1 β), interleukin 6 (IL-6) and Tumor Necrosis Factor-alpha (TNF-α) in patients with ischemic heart disease in Kosovo. Inflammatory response and cytokine elaboration are integral components of the host response to the tissue injury and play an active role after myocardial infarction.

METHODS: The study involved a group of twenty patients (n= 20), over 49 years of age with an initial diagnosis of coronary heart disease admitted at the Coronary care Unit of the Department of Cardiology of University Clinical Center of Kosovo, and control group (n=25) without systemic disease. Blood samples were taken during the first 24 hours of hospitalization and referred to our laboratory. Serum samples were assessed using a kit with a specific high sensitivity methodology—ELISA test, according to the manufacturer's instructions (IBL International GmbH, Hamburg, Germany). Statistically results are expressed as mean values and standard deviation (SD), Quantitative variables Student's t-test, Qualitative parameters Pearson's chi – square test.

RESULTS: The study showed raised mean values for hs-CRP, IL-1 β, IL-6 and TNF- α in the study group compared with control group. The concentrations of each protein (control group vs. study group) were as follows: IL-1β (2.1 ± 2.2 vs. 11.0 ± 10.8), IL-6 (1.9 ± 1.6 vs. 21.6 ± 48.8), TNF- α (64.6 ± 72.3 vs. 98.8 ± 92.0) and hs-CRP(2.5 ± 2.6 vs. 10.9 ± 5.5). The differences between the groups showed statistical significance $p < 0.05$.

CONCLUSIONS: Coronary heart disease was associated with increased circulating concentrations of hs- CRP, IL-1 β, IL-6 and TNF- α, reflecting activity of the disease. Biomarkers of inflammation may serve to help identify patients at risk for CVD, to monitor the efficacy of treatments, and to develop new pharmacological tools. However, due to the complexities of CVD pathogenesis long term studies are needed.

Cardiovascular disease

Cod: 0308

NESFATIN-1 – A NOVEL POTENTIAL CARDIOPROTECTIVE FACTOR IN NON-DIABETIC, NON-OBESE MEN

K. Bergmann[1], M. Kretowicz[2], J. Manitius[2], G. Sypniewska[1]
[1]*Department of Laboratory Medicine, Nicolaus Copernicus University, Collegium Medium In Bydgoszcz, Poland*
[2]*Department of Nephrology, Hypertension and Internal Diseases, Nicolaus Copernicus University, Collegium Medicum in Bydgoszcz, Poland*

BACKGROUND: Nesfatin-1, a recently discovered anorexigenic neuropeptide and adipocytokine, is considered as anti-diabetic factor. The role of nesfatin-1 in the pathogenesis of cardiovascular disease (CVD) has not been clearly explained yet. We assessed the relationship between serum nesfatin-1, selected CVD risk factors and biochemical markers of cardiac ischemia/injury (fibulin-1, troponin T) in non-diabetic individuals.

METHODS: Study included 80 normoglycemic, non-obese (BMI<30 kg/m^2) subjects aged 25-40 years (32 women, 48 men). Blood pressure and basic anthropometric measurements were performed. Fasting plasma glucose, glycated hemoglobin (HbA1c), lipid profile, bilirubin, insulin, C-reactive protein (CRP), apolipoproteins AI and B (apoAI, apoB), troponin T (hs-TnT) were measured on ARCHITECT ci8200 (Abbott Diagnostics) and Cobas e411 (Roche Diagnostics) analyzers. LDL-cholesterol (LDL-C), non-HDL-cholesterol (non-HDL-C) and atherogenic indexes (TC:HDL-C, apoB:apoAI) were calculated. Nesfatin-1 and fibulin-1 (FBLN1) were assayed using commercially available ELISA kits. Carotid intima-media thickness (IMT) were measured by an ultrasound method.

RESULTS: Nesfatin-1 concentration was significantly higher in women compared to men (1.28 vs. 0.82 ng/mL; p=0.02). However, in men significantly higher values of anthropometric measurements, blood pressure, glucose, triglycerides, non-HDL-C, apoB, atherogenic indexes, IMT and lower concentrations of HDL-C and apoAI were observed. In men nesfatin-1 correlated moderately and inversely with total cholesterol, LDL-C, non-HDL-C, apoB, atherogenic indexes and strong inverse correlation with hs-TnT (R= -0.62; p<0.001) and FBLN1 (R= -0.76; p<0.001) was observed. Nesfatin-1 was positively related to bilirubin (R=0.44; p=0.02), a potential anti-oxidative factor. Interestingly, these correlations were stronger in normal-weight men compared to overweight and did not occur in women. Prevalence of proatherogenic lipid profile, elevated CRP and IMT values in men decreased in subsequent nesfatin-1 tertiles.

CONCLUSIONS: Association of nesfatin-1, CVD risk factors and cardiac injury markers in non-diabetic subjects seems to be gender-specific; in men indicates its potential anti-atherogenic and cardioprotective properties.

Cardiovascular disease

Cod: 0309

INOS GENE POLYMORPHISM AND IL-6 LEVELS CORRELATED IN STABLE ISCHEMIC HEART DISEASE: A PILOT STUDY IN INDIA

S. Bhardwaj[2], J. Bhattacharjee[3], M. Bhatnagar[2], S. Tyagi[1]
[1]*G.B. Panth Hospital, Delhi, India*
[2]*Lady Hardinge Medical College & Sucheta Kriplani Hospital, Delhi, India*
[3]*Safdurjung Medical College & Associated Hospital, Delhi, India*

BACKGROUND: Ischemic Heart Disease is the result of inflammatory milieu that surrounds damaged endothelium. Cytokines are the mediators of inflammation and their level is reflected in systemic circulation as well. Even in patients of stable ischemic heart disease, these cytokines might be responsible for continuous insult and predispose them to frequent cardiac events. A single nucleotide polymorphism of iNOS (inducible nitric oxide synthase) gene in exon 16 brings a structural change in its protein and enhanced production of nitric oxide which along with cytokines may prove to be a lethal combination in stable ischemic heart disease patients. So in this study, we correlated the plasma levels of cytokine Interleukin-6 with genotypes of iNOS gene C150T polymorphism.

METHODS: We conducted a case-control study enrolling 70 patients of angiographically documented stable ischemic heart disease, attending medicine OPD of GB Pant Hosp and Sucheta Kriplani Hospital, Delhi, India. Plasma IL-6 levels were measured using ELISA. iNOS gene polymorphism was studied using PCR-RFLP. Statistical analysis was done using SPSS version20.

RESULTS: We observed significantly raised levels of IL-6 ($p<0.05$) in cases compared to controls. On gene analysis, we observed that T allele which was more frequent in cases contributed to the disease by producing higher amounts of NO but only in the presence of inflammatory marker. IL-6 appears to be an important mediator of inflammation even in stable cases of ischemic heart disease and predispose the patients with T allele to produce higher levels of NO.

CONCLUSIONS: We conclude, that slow inflammation characterizes silent plaques as well. C150T polymorphism of iNOS gene leads to higher production of NO in presence of inflammation. NO is considered to be a double edged sword so it prompts for future research to consider treatment modalities based on long term NO therapy in ischemic heart disease patients.
Keywords: iNOS gene, single nucleotide polymorphism, stable ischemic heart disease, IL-6

Cardiovascular disease

Cod: 0310

INTRODUCTION OF THE HIGH SENSITIVITY CARDIAC TROPONIN ASSAY IN A TEACHING HOSPITAL – IMPACT ON DIAGNOSTIC PROCEDURES AND THE NUMBER OF ACUTE MYOCARDIAL INFARCTIONS

V. Bhayana[1]
[1]*London Health Sciences Centre, London, Ontario, Canada*

BACKGROUND: The new high sensitivity troponin T (hs-TnT) test has a high negative predictive value for acute myocardial infarction (AMI) and is therefore a useful rule-out tool for physicians. However, due to its low positive predictive value for AMI, a large number of non-AMI patients are also found to have elevated levels of troponin. In this study, we investigate the impact on utilization of diagnostic & clinical procedures as well as changes in the number of AMIs after the implementation of hs-TnT assay.

METHODS: Fourth generation TnT and hs-TnT were measured on the Roche Modular analyzers at three teaching hospital sites. We designed an algorithm for the diagnosis of AMI to improve the utilization of troponin. According to this algorithm, patients presenting with symptoms of ischemia were tested for baseline hs-TnT. These patients were divided into four groups based on hs-TnT levels: <3 ng/L, 3 to <14 ng/L, 14 to 50 ng/L and >50 ng/L. Each group was further divided into sub-groups based on clinical suspicion of AMI: Low, Moderate or High. Repeat analysis was done ≥3h after the baseline lelvels. A change in absolute troponin value of ≥10 ng/L was considered likely AMI. Data for hsTnTs, angiograms, stent angioplasties and AMI were collected using the hospital information system for one year pre- and one year post-implementation of hs-TnT .

RESULTS: An 8.5% increase in troponin usage was observed after the implementation of the hs-TnT assay. There were small increases in the number of angiograms performed (0.1%) and the number of diagnosed AMIs (4.5%). Interestingly stented angioplasty declined by 4.3%. Of all the acute myocardial infarctions, acute transmural AMI increased by 2.2% while the acute subendocardial AMI increased by 32.2%. There was a 41% decline in the number of acute myocardial infarction of unspecified site.

CONCLUSIONS: Our results indicate that the introduction of hsTnT led to a modest increase in the laboratory usage of troponin. There was little or no change in the number of angiograms & angioplasties performed and in the number of acute myocardial infarction diagnoses. There was an increase in the subendocardial AMIs due to heightened sensitivity of troponin.

Cardiovascular disease

Cod: 0311

POTENTIAL IMPLICATION OF CIRCULATING MIRNA-208A INTO DIAGNOSE OF ACUTE MYOCARDIAL INFARCTION

S. Białek[1], D. Górko[3], A. Zajkowska[2], G. Sygitowicz[1], K. Łukasz[3], A. Stachurska[2], M. Grabowski[3], M. Małecki[2], G. Opolski[3], D. Sitkiewicz[1]

[1]*Department of Medical Laboratory Diagnostics, Medical University of Warsaw, Poland*
[2]*Department of Molecular Biology, Medical University of Warsaw, Poland*
[3]*Ist Department of Cardiology, Medical University of Warsaw, Poland*

BACKGROUND: The biochemical confirmation of myocardial infarction is based on cardiac troponin (cTnI) determination. Recent scientific results suggested that miRNAs might become a new biomarker of myocardial injury. MicroRNAs are short, non protein-coding RNA molecules that play a crucial role in the post-transcriptional regulation of gene expression. The aim of our study was to evaluate the level of circulating miRNA-208a in the plasma of patient with ST-elevation acute myocardial infarction (STEMI).

METHODS: We studies 19 STEMI patients (4 women and 5 men, aged 44-85 years), who underwent coronary angiography within 3 hours from the onset of the chest pain, and 20 patients who underwent elective coronary angiography: 12 patients with stable symptomatic coronary artery disease (CAD), and 8 patients with a negative observation of CAD as a control group. Six blood samples were collected from STEMI patients: on admission (time 0) and 3, 6, 12, 24, and 48 hours after; in CAD and control group blood samples were taken only once. Plasma levels of miRNA-208a determined by real-time polymerase chain reaction using a spike in control miR as reference, and their relative ratios were calculated. cTnI was measured in serum samples from patients of all investigated groups. The level of circulating miRNA-208a in plasma was compared with concentration of cTnI.

RESULTS: Significant increase of the level of plasma miR-208a on admission (time 0) in patients with STEMI was observed. Plasma concentration of miR-208a increase in time up to 3 hours after presentation and reminded increased until 12 h. In the time points 6 h and 12 h, the level of miR-208a was still significantly higher than those at 0 time. After 24 h and 48 h the concentration of miR-208a return to the baseline level. The maximum concentrations of both cardiac biomarkers 6 hours after admission were stated. The levels of cTnI as well as CKMBmass were increased during observation up to 48 h. Significant correlations between changes of miR-208a and cTnI and CKMBmass released from infarct area were observed.

CONCLUSIONS: The circulating miRNA-208a is an interesting and promising candidate for a new biomarker in early diagnosis of myocardial infarction.

Cardiovascular disease

Cod: 0312

EVALUATION OF INFLAMMATION, LIPID STATUS END OBESITY IN PATIENTS WITH ISCHEMIC HEART DISEASE FOLLOWED BY CORONAROGRAPHY

M. Boncheva[1], M. Radkova[1], D. Daneva[1]
[1]*Lozenez University Hospital*

BACKGROUND: The current research aims to evaluate the risk of heart attack by comparing and analyzing data from a survey of high sensitive C-reactive protein (hsCRP) and some lipid exchange laboratory parameters in IHD patients who have undergone coronarography.

METHODS: A total of 132 patients were investigated, all of them diagnosed with IHD at "Lozenetz" University Hospital – Sofia. For the sake of the study the patients had the following parameters investigated: BMI, hsCRP, total cholesterol (TC), high density lipoproteins cholesterol (HDL-C), low density lipoproteins cholesterol (LDL-C), triglycerides (TrigI), apolipoprotein A1 (ApoA1), apolipoprotein B (ApoB), as well as the coefficients ApoB/ApoA1 and the so called atherogenic index of plasma (AIP). The so called non-HDL-Cholesterol (non-HDL-C) has also been estimated for each individual patient. Patients manifesting clinical data of viral or bacterial infection characterized by CRP values higher than 25 mg/L have been excluded from the study.

RESULTS: The invasive investigation technique includes selective coronary arteriography via radial or femoral approach. The lipid risk factors are outside the boundaries of reference cut-off values for about 90% of the IHD patients. The difference between patients with significant and non-significant stenosis can be described as a minor one. Hazard Ratio (HR) shows the highest correlation with HDL-C (1,313), the correlation ApoB/ApoA1 (1,305) and AIP (1,312). Low degree inflammation is assessed by hsCRP values. These are above 3mg/L for 27% of patients with significant stenosis and for 62% of patients with non-significant stenosis. The risk evaluation marker has the highest values of HR – 1,659.

CONCLUSIONS: To evaluate the risk of acute heart attack in IHD patient the authors recommend that data on hsCRP, HDL-C, ApoB/ApoA1 correlation and AIP should be used. We recommend that the same data should be used to control and assess therapy of lipid risk and inflammation.

Cardiovascular disease

Cod: 0313

CYSTATIN C AS A RISK FACTOR MARKER IN ATHEROSCLEROSIS

B. Bozkurt[3], F.M. Yılmaz[1], C. Topçuoğlu[1], Ö. Kadılar[3], M. Ercan[2]
[1]*Ankara Numune Eğitim ve Araştırma Hastanesi*
[2]*Aydın Halk Sağlığı Laboratuvarı*
[3]*Sakarya Üniversitesi, Eğitim ve Araştırma Hastanesi*

BACKGROUND: Cystatin C is a potent inhibitor of proteolytic enzymes (cathepsin) involved in the breakdown of elastin and collagen. Low levels of cystatin C in atherosclerotic lesions was shown by immunohistochemical studies. However, blood cystatin C levels and atherosclerotic heart disease relationship could not be demonstrated clearly.We aimed to investigate cystatin C levels and the correlation between cystatin C and traditional inflammatory markers such as hs-CRP, fibrinogen and erythrocyte sedimentation rate (ESR) in patients with stable angina in relation with coronary angiography score.

METHODS: A total of 117 patients including 62 female and 55 male patients were included in the study. The individuals who were admitted to Ankara Numune Education and Research Hospital cardiology outpatient clinic with complaints of angina and underwent a coronary angiography were included in the study. Individuals with normal coronary angiography result consisted the control group. Patient group was divided into subgroups according to the Gensini scores (Group 1: 10-20, group 2: 20-40, group 3: >40). Cystatin C levels were determined with an immunoturbidimetric method at Aeroset analyzer (Abbott Laboratories, Illinois, USA)

RESULTS: Cystatin C and creatinine levels in the patient group were significantly higher than the control group (p:0,006 and p:0,006; respectively). Cystatin C and creatinine levels were also found to be significantly higher in Group 3 than the control group (p:0,031 and p:0,020; respectively). Fibrinogen, ESR, hs-CRP and homocysteine levels were similar between groups. Serum cystatin C levels was observed to have as a strong correlation with serum creatinine and a moderate correlation with age in correlation analysis. BMI, hs-CRP, ESR, homocysteine, fibrinogen values did not have a significant correlation with cystatin C.

CONCLUSIONS: Cystatin C is found to be an earlier increasing marker than traditional inflammation markers for atherosclerosis.

Cardiovascular disease

Cod: 0314

HOMOCYSTEIN AND MTHFR POLYMORPHISM AS NEW RISK FACTORS OF STROKE IN A TUNISIAN GROUP

N. Brahim[4], B. Yosr[1], E.O. Mabrouka[3], A. zied[3], M. Ridha[2], M. Chakib[3]
[1] *Research Unit UR12DN02; Biochemistry Department, Military Hospital, Tunis*
[2]*Neurology Department, Military Hospital Tunis, Tunisia*
[3]*Research Unit UR12DN02; Biochemistry Department, Military Hospital, Tunis*
[4]*Research Unit UR12DN02; CMTS Tunis, Tunisia*

BACKGROUND: Stroke represents a major problem of public health because of its frequency and severity. Factors favoring the occurrence of ischemic stroke are multiple. Recently, new factors are considered such as Homocystein and genetic factors involved in its metabolism. The objectives of this study are to establish a relationship between Hcy, Folat and vitB12 plasma levels and the risk of developing ischemic stroke to study genetic factors such as C677T polymorphism of MTHFR in a Tunisian stroke group.

METHODS: A case control study including 36 consecutive patients with confirmed ischemic stroke and 66 controls was performed. Fasting plasma Hcy, folate and Vit B12 levels were assessed and C677T polymorphism was determined.

RESULTS: Results of this study show high levels of Hcy in patients with stroke compared to controls (22,17 +/-13.72 umol/l vs 13,62 +/- 6,42 umol/l). Hyperhomocysteinemea was found in 63 percent of patients. In our study, the T allele frequency was 0,59 in patients. The highest Hcy concentrations were found in TT genotype patients.

CONCLUSIONS: Hcy is an independent risk factor for the occurrence of stroke. The C677T polymorphism seems to be associated with the occurrence of this pathology.

Cardiovascular disease

Cod: 0315

SERUM CA 125 LEVELS IN PATIENTS WITH CHRONIC HEART FAILURE

N. Budima[1], D. Koçinaj[2], Z. Baruti[1], N. Bislimi[1], S. Shabanaj[1], A. Lepaja[1], B. Bislim[1], M. Kutllovci[1]
[1]*Clinic of Medical Biochemistry, University Clinical Center of Kosova*
[2]*Coronary Care Unit, University Clinical Center of Kosova*

BACKGROUND: Carbohydrate antigen 125 (CA-125) is a tumor marker widely used for diagnosis and monitoring of patients with ovarian cancer. Lately increased serum CA125 values have also been documented in patients with heart failure. The aim of our study was to asses the relationship between Ca 125 level and the severity of chronic heart failure (CHF).

METHODS: The study involved 50 patients aged < 75 year. 25 patients were admitted at Cardiology Department requiring hospitalization diagnosed with CHF and 25 age and sex matched control subject without CHF. CHF patients were divided into 2 groups based on the presence of fluid in the pleural cavity. The study design was based upon the collection of histories, clinical examination, echocardiography and laboratory data. Serum Ca 125 was measured by an enzyme-linked immunosorbent assay (ELISA).

RESULTS: Ca 125 was significantly higher in CHF patients than controls ($p<0.001$). Serum levels were related to the severity of CHF, higher in patients with advanced New York Heart Association (NYHA) functional class. Patients in NYHA classes III and IV had significantly higher mean values of CA125, than patients in class II. Significantly high serum Ca 125 levels were found in CHF patients with pleural fluids when compared with control group and CHF patients without pleural fluid.

CONCLUSIONS: Ca 125 primarily used for ovarian cancer screening or therapeutic monitoring is gaining more attention to CHF severity. Ca 125 could be used as diagnostic and prognostic biomarker of heart failure and it may be a useful additional tool for the evaluation and clinical staging of these patients.

Cardiovascular disease

Cod: 0316

RED CELL DISTRIBUTION WIDTH IS ASSOCIATED BY MORE SEVERE HEART FAILURE WITH LEFT VENTRICULAR SYSTOLIC DYSFUNCTION

I. Bujakiewicz[1], J. Kaczmarek[1], A. Milewska[2], A. Nowak[2], D. Przymuszala-Stasiak[2], K. Barecka[2], T. Krauze[2], D. Karbowy[2], J. Tarchalski[2], M. Biczysko[2], P. Guzik[2]

[1]*Central Laboratory, Heliodor Swiecicki University Hospital, Poznan University of Medical Sciences*

[2]*Department of Cardiology - Intensive Therapy Poznan University of Medical Sciences*

BACKGROUND: Red cell distribution width (RDW) measures variation in red blood cell size. Recently, the increased RDW has been associated with adverse clinical outcomes, including mortality, in chronic heart failure (HF) patients. In this study we compared cardiac structure and function in HF patients and reduced left ventricular ejection fraction (LVEF) < 50% according to low or high RDW.

METHODS: Cardiac examination and standard biochemical blood evaluation was performed in 249 consecutive ambulatory patients with HF and LVEF <50%. The coefficient of variation of RDW (RDW-CV) was measured automated by haematological analyser (Sysmex XT 2000i, Japan). Patients were divided to a group with low RDW-CV (up to median RDW-CV) or high RDW-CV (> median RDW-CV). The comparison between both groups was made with nonparametric Mann-Wilcoxon test and the results shown as median with the 25th-75th percentile range.

RESULTS: The median patients' age was 64.0 (58.0-71.3) years old and there were 39 (15.7%) women. Median LVEF was 30.4 (22.6-36.6)% and RDW-CV 13.9 (13.2-14.8)%. The comparison of patients in the low RDW-CV group with high RDW-CV showed that those from the high RDW-CV had significantly worse LVEF (31.6; 24.7- 38.2 vs. 28.2; 21.9-35.5%; p=0.0195), more dilated left atrium in systole (21.0; 16.5-25.7 vs. 23.5; 19.1- 29.5 cm^2; p=0.0053) and diastole (18.4; 14.1-21.9 vs. 19.8; 15.0- 25.7 cm^2; p=0.0126), and left ventricle in systole (34.3; 28.1-42.9 vs. 37.9; 31.7- 44.7 cm^2; p=0.0318), lower systolic blood pressure (123.1; 114.9-136.5 vs. 119.7; 105.5- 129.0 mmHg; p=0.0025), higher plasma concentration of N-terminal prohormone brain-type natriuretic peptide (717; 297-1760 vs. 1552; 609-3498 pg/mL; p<0.0001) and the shorter distance of the 6-minute walking test (480; 407-544 vs.420; 288-512 m; p=0.0056).

CONCLUSIONS: Patients with systolic HF and high RDW-CV have more advanced cardiac remodelling, worse left ventricular systolic function with increased load, lower blood pressure and poorer exercise tolerance than their peers with low RDW-CV. The understanding of the mechanisms behind the relationship between increased RDW-CV and more severe form of systolic HF requires further investigations.

Cardiovascular disease

Cod: 0317

EVALUATION OF STANDARDIZATION CAPABILITY OF CURRENT CARDIAC TROPONIN I (CTNI) ASSAYS BY A CORRELATION STUDY: RESULTS OF AN IFCC PILOT PROJECT

J.R. Tate[9], D.M. Bunk[4], R.H. Christenson[6], J.H. Barth[5], A. Katrukha[8], J.E. Noble[1], M. Panteghini[3], H. Schimmel[7], L. Wang[2]
[1]*Analytical Science Group, National Physical Laboratory, Teddington, UK*
[2]*Biochemical Science Division, National Institute of Standards and Technology, Gaithersburg, MD, USA*
[3]*Centre for Metrological Traceability in Laboratory Medicine (CIRME), University of Milan, Milano, Italy*
[4]*Chemical Science and Technology Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, USA*
[5]*Clinical Biochemistry, Leeds Teaching Hospitals NHS Trust Leeds General Infirmary, Leeds, UK*
[6]*Department of Pathology, University of Maryland School of Medicine, Baltimore, MD, USA*
[7]*European Commission, Joint Research Centre, Institute for Reference Materials and Measurements, Geel, Belgium*
[8]*HyTest Ltd, Turku, Finland*
[9]*Pathology Queensland, Department of Chemical Pathology, Royal Brisbane and Women's Hospital, Herston, Qld, Australia*

BACKGROUND: The IFCC WG-TNI performed a pilot study in collaboration with industry to investigate the feasibility of preparing a commutable and stable cTnI reference material (RM). The study aimed to test whether serum pools prepared from patient sera could be used as an RM to standardize cTnI measurement.

METHODS: cTnI-positive serum samples from 90 patients presenting to the emergency department with suspected acute myocardial infarction were used to prepare seven pools in the range, 200-10,000 ng/L. All samples were assessed for method comparison, commutability, stability and interferences by 16 cTnI commercial systems according to predefined testing protocols.

RESULTS: Each assay was assessed against median cTnI concentrations measured by 16 systems using Passing-Bablok regression analysis of 79 patient samples with cTnI values above each assay's declared detection limit. An 8- to 9-fold difference in cTnI concentrations was observed among assays, with Pathfast giving lowest values and Immulite 1000 TPI highest. After correction by a mathematical recalculation using slope and y-intercept values, between-assay variation was re-assessed. At 190 ng/L cTnI concentration, average variation of pools reduced from 49% (range, 43-55%) to 16% (range, 14-19%), at medium concentrations (814, 1634 and 1845 ng/L) from 35% (range, 34-36%) to 13% (range, 11-15%), and at high concentrations (4155 and 7517 ng/L) from 25% (range, 24-27%) to 7% (range 7.0-7.4%). For patient samples at low cTnI concentration, average variation reduced from 40% (range, 11-65%) to 22% (range, 11-38%), at medium concentration from 37% (range, 16-63%) to 20% (range, 7-58%), and at high concentration from 29% (range, 13-63%) to 14% (range, 7-42%). Overall, the 16 assays demonstrated negligible bias after realignment; however, a few samples showed substantial positive and/or negative differences for individual cTnI assays that contributed to larger inter-assay variability than for the serum pools.

CONCLUSIONS: cTnI values for pooled samples were equivalent within acceptable limits after straightforward assay realignment. This evidence indicates that pools are a viable alternative for providing large volumes of commutable sample for use as a surrogate matrixed RM for cTnI standardization.

Cardiovascular disease

Cod: 0318

SERUM LEVEL OF SUPAR AND YKL-40, A NEW BIOMARKER IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

Ü. Can[1], F.H. Yerlikaya[2], A. Toker[2], A. Arıbas[3], K. Akbuğa[3]
[1]*Konya Education and Research Hospital, Department of Biochemistry, Konya, Turkey*
[2]*University of Necmettin Erbakan, Meram Faculty of Medicine, Department of Biochemistry, Konya, Turkey*
[3]*University of Necmettin Erbakan, Meram Faculty of Medicine,Department of Cardiology, Konya,Turkey*

BACKGROUND: Low grade inflammation plays an important role in coronary artery disease from the initiation of endothelial dysfunction to plaque formation and plaque destabilization and disruption with superimposed thrombosis leading to acute myocardial infarction (AMI). The soluble urokinase plasminogen activator receptor (suPAR) and chitinase 3-like protein 1 (YKL-40) are a new potential biomarker of inflammation, is secreted in different tissues with inflammation. We tested the hypothesis whether the inflammatory biomarker YKL-40 alone or in combination with suPAR could be a new prognostic biomarker for AMI.

METHODS: A total of 55 patients with AMI and 70 control subjects who are age and sex matched with AMI group were included in our study. The diagnosis of AMI was based on the World Health Organization (WHO) classification criteria. All patients underwent the clinical assessment, consisting of electrocardiography, and serum cardiac markers. Serum YKL-40 and suPAR levels were measured at the first and second days of AMI by using a ELİSA method.

RESULTS: Serum YKL-40 levels in the first and second day of AMI patients and the control subjects were found as 69.10 ± 16.58; 60.64 ± 16.01 and 37.11 ± 4.30 ng/ml, respectively. Serum YKL-40 levels were significantly higher in the first and second day of AMI patients than those of the control subjects ($p<0.001$). Serum YKL-40 levels in the first of AMI patients were significantly higher in second day of AMI patients ($p<0.01$). Serum suPAR levels in the first and second day of AMI patients and the control subjects were found as 6.58 ± 3.24; 5.86 ± 4.56 and 2.26 ± 1.92 ng/ml, respectively. Serum suPAR were significantly higher in the first and second day of AMI patients than those of the control subjects ($p<0.001$).

CONCLUSIONS: Serum suPAR and YKL-40 can be considered a strong inflammatory marker of AMI. We concluded that serum suPAR and YKL-40 levels at the first day and second day of AMI could be used as an clinically useful marker for diagnosis of AMI.
Key words: The soluble urokinase plasminogen activator receptor; acute myocardial infarction; chitinase 3-like protein-1

Cardiovascular disease

Cod: 0319

SERUM S100 LEVELS IN ACUTE CORONARY SYNDROME (ACS)

T. Candar[3], S. Ozdemir[3], A.K. Oguz[2], B. Ekici[1], H. Ural Kayalik[4], S. Demirtas[3], S. Korkmaz[1], K. Mergen[3]
[1]*Ufuk University School of Medicine, Department of Cardiology, Ankara, Turkey*
[2]*Ufuk University School of Medicine, Department of Internal Medicine, Ankara, Turkey*
[3]*Ufuk University School of Medicine, Department of Medical Biochemistry, Ankara, Turkey*
[4]*Ufuk University,Vocational Schools of Higher Education, Ankara, Turkey*

BACKGROUND: S100, a calgranulin family protein released from white blood cells, is involved in inflammatory cardiovascular disease. It was hypothesized that the plasma level of S100 can be used to predict outcome in patients with chronic coronary artery disease (CAD). We aimed to determine the relationship between S100 protein levels and severity and complexity of CAD in patients with acute coronary syndromes.

METHODS: This pilot study included 81 patients who were admitted to the emergency room for the evaluation of the angina pectoris. According to the clinical status and cardiac enzyme levels the patients had undergone coronary angiography. Troponin-T levels were repeated after 6 hours. Serum S100 (S100 A1B and S100BB) testing was performed using the Roche Elecsys® 2010, S100 reagent kit (assay duration 18 minutes, measuring range 0.005–39 μg/L, cross reactivity against S100 < 1%). Both of them were assessed by the principles of ECLIA. The independent relationship between serum S100 protein and the acute coronary syndrome status was statistically evaluated using PASW Statistics 18 for Windows
.

RESULTS: Mean age of the study population was 61.12 ± 13.57 years, of whom 41 were woman (50.6%) and 40 man (49.4%). Of the patients, 23.5% had diabetes mellitus, 61.7% had hypertension, 43.2% had hyperlipidemia, and 37.0% were smokers. Mean serum S100 protein values were 0.29 ± 0.79 μg/L in the control group, 0.20 ± 0.48 μg/L in the group with NSTEMI, and 0.11 ± 0.12 μg/L in the group with STEMI (p=0.294). According to Spearman analysis, no correlation was found between serum S100 protein and Gensini score (p=0.093, r=0.188). However, there was statistically significant correlation between S100 and troponin-T levels (p=0.05 r=0.253).

CONCLUSIONS: Previously, it was reported that, rising levels of serum S100 protein was a specific and sensitive clinically relevant marker of acute coronary syndromes. Contrary to the literature, we did not determine any correlation between S100 protein levels and acute coronary syndromes. It can be explained by the small-scale of the study. Larger-scale studies should be performed to shed light on this topic.

Cardiovascular disease

Cod: 0320

CARDIAC TROPONIN CONCENTRATIONS IN PATIENTS WITH CHEST DISCOMFORT: STRONG CONTRIBUTION OF THE HEART AND THE KIDNEYS

E.P. Cardinaels[1], S. Altintas[3], M.O. Versteylen[3], I.A. Joosen[3], J.E. Wildberger[5], H.J. Crijns[3], O. Bekers[2], M.P. van Dieijen-Visser[2], B.L. Kietselaer[4], A.M. Mingels[2]

[1]*Central Diagnostic Laboratory, Department of Clinical Chemistry, Cardiovascular Research Institute Maastricht (CARIM), Maastricht University Medical Centre (MUMC+), the Netherlands*

[2]*Central Diagnostic Laboratory, Department of Clinical Chemistry, MUMC+, the Netherlands*

[3]*Department of Cardiology, CARIM, MUMC+, the Netherlands*

[4]*Department of Cardiology, Department of Radiology, CARIM, MUMC+, the Netherlands*

[5]*Department of Radiology, CARIM, MUMC+, the Netherlands*

BACKGROUND: Highly sensitive cardiac troponin (hs-cTn) concentrations are strong predictors of acute cardiovascular events in patients with coronary artery disease (CAD). However, hs-cTn are also known to be elevated in patients with renal dysfunction, complicating their interpretation. Therefore, we investigated hs-cTn concentrations on their relative association with cardiac imaging measures and renal function in patients with chest discomfort suspected for CAD.

METHODS: A cohort of 1864 patients with symptoms of chest discomfort underwent cardiac computed tomographic angiography and echocardiography. Serum samples were analysed using hs-cTnT and a new hs-cTnI assay. Renal function was measured by the estimated glomerular filtration rate (eGFR), established from serum creatinine and cystatin C. On follow-up, the incidence of cardiovascular events was assessed.

RESULTS: Hs-cTn concentrations were significantly associated with cardiac imaging parameters, such as coronary calcium score (hs-cTnT: stβ=0.100; hs-cTnI: stβ=0.122) and left ventricular mass (hs-cTnT: stβ=0.179; hs-cTnI: stβ=0.267) and were also strongly associated with eGFR (hs-cTnT: stβ=-0.289; hs-cTnI: stβ=-0.222) (all p<0.001 and after adjustment for traditional risk factors). Interestingly, renal function exerted no confounding effects on the association of cardiac imaging parameters with hs-cTn concentrations. Moreover, the association between eGFR and hs-cTn remained equally strong among patients with no plaques (hs-cTnT: stβ_{eGFR}:-0.295; hs-cTnI: stβ_{eGFR}:-0.228), non-obstructive plaques (hs-cTnT: stβ_{eGFR}:-0.290; hs-cTnI: stβ_{eGFR}:-0.176) and obstructive plaques (hs-cTnT: stβ_{eGFR}:-0.293; hs-cTnI: stβ_{eGFR}:-0.249) (all p<0.001). Both hs-cTnT and hs-cTnI were independent prognostic markers for cardiovascular events, irrespective of renal function and CAD.

CONCLUSIONS: In patients without known kidney disease, we identified CAD and renal function as two separate reasons for troponin accumulation.

Cardiovascular disease

Cod: 0321

EVALUATION OF TROPONIN T ON AQT90 FLEX AND COBAS 8000 AS A RULE IN/OUT TOOL IN AN EMERGENCY WARD

L.G. Caroline[1], E. Séverine[1], B. Eric[1], K. Jean-François[2], C. Etienne[1]
[1]*Department of Clinical Chemistry, University of Liège, Unilab Lg, CHU Sart-Tilman, B-4000 Liège, Belgium*
[2]*Department of Motility Sciences, University and University Hospital of Liège, B-4000 Liège, Belgium*

BACKGROUND: Troponin measurement is the gold standard for diagnosis of Acute Myocardial Infarction (AMI). Troponin (highly sensitive (hs), T or I) is measured by immunochemistry instrument or by Point of Care (POCT). POCT can be useful in emergency lab or ward for a faster diagnosis of patients with chest pain. Our study compared analytical performance of a POCT AQT90 Flex (Radiometer Medical) (AQT) and TnThs Cobas 8000 (Roche Diagnostics) (Cobas). We also compared the clinical performance of both methods at recommended cut-off (14 ng/L for Cobas and 30 ng/L for AQT).

METHODS: We selected 104 patients (296 samples) (range: 6-13822 ng/L) admitted in the Emergency ward for which at least 1 troponin determination (Cobas 8000) had been re-quested in the past 24 hours according to rule in/out procedure applied by this ward. Samples were then measured with the AQT. Inter-assay CV was maximum 8.6% and 9.6% for Cobas and AQT respectively. The cut-off defined as the 99th percentile for Roche was 14 ng/L and the recommended decision threshold value was 30 ng/L for Radiometer. Retrospective analysis of final diagnostic was obtained for all participants: we considered as “true positive” patients for whom a final diagnostic was ST segment-Elevation Myocardial Infarction (STEMI) or non STEMI (NSTEMI).

RESULTS: On the whole range of measure, the 2 methods showed a good correlation (r2=0.98). Regression equation was Cobas = 0.98 AQT + 31 ng/L (95%CI of the intercept: (26.7;37.7) and 95% CI of the slope (0.96;1)). When we stratified, for the values <54 ng/L, the equation became Cobas = 0.52 AQT +1.1 ng/L (95%CI of the intercept: (-4.8;5.5) and 95% CI of the slope (0.39;0.69)). Bland and Altman plot did not show any bias. At admission [2-7 hours], 78 (81%) of admitted patients were finally considered as AMI, sensitivity was 92 % [96%] for Cobas and 78% [91%] for AQT. Specificity was 15% for Cobas (cut-off 14ng/L) or 73% (cut-off 54 ng/L) and 76% for AQT.

CONCLUSIONS: Overall, there was a good correlation between the 2 methods. However, using a cut-off of 14 ng/L for Cobas is questionable for a rule in/out procedure in an emergency ward. Using 54 ng/L for Roche and 30 ng/L for AQT would have led to the best discrimination between patients presenting AMI or not.

Cardiovascular disease

Cod: 0322

MMP-9 AND CLASSIC ATHEROSCLEROSIS MARKERS IN LITHUANIAN FAMILIES WITH SELF-REPORTED DISEASE

A. Coj[2], Z. Kučinskienė[2], V. Kučinskas[1], A. Molytė[1]
[1]*Department of Human and Medical Genetics, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
[2]*Department of Physiology, Biochemistry, Microbiology and Laboratory Medicine, Vilnius University, Vilnius, Lithuania*

BACKGROUND: Atherosclerosis is a multifactorial disease. The causes are not fully disclosed, however, studies show that many factors promote atherosclerosis development. We have investigated MMP-9 and other classical markers of atherosclerosis in the Lithuanian families.

METHODS: We have investigated 99 families (father, mother and at least one child) from different regions of Lithuania. Serum samples from 329 participants were analyzed for total cholesterol, LDL cholesterol (LDL-chol), HDL cholesterol (HDL-chol), triglycerides (TG), ApoAI, ApoB and their ratio, Lp(a), hs-CRP, glucose, matrix metalloproteinase-9 (MMP-9) and interleukin-1 beta. For statistical analyses we used IBM SPSS Statistics 20.

RESULTS: 56 fathers, 66 mothers and 37 children self-reported as have had or having one of these conditions: hypertension, diabetes mellitus, coronary heart disease, stroke or overweight. We found that fathers with self-reported disease had statistically significant higher TG and ApoB concentrations than mothers ($p<0.017$ and $p<0.001$ respectively) and mothers had higher concentration of MMP-9 than fathers ($p=0.026$). From 37 children only 15 were from 10 to 17 years old and statistical analysis was not performed. Both parents' groups were divided into three age groups. From 56 fathers with disease 39 was in the 2-nd age group (40-54 years old), 15 – in the 3-rd age group (>55 years old) and no one was in the 1-st age group (19-39 years old). There was no difference between the second and the third fathers' group for all analyzed classic atherosclerosis markers and MMP-9, but a higher HDL-chol concentration in third group compared to the second was found. Out of 66 sick mothers 3 were in the 1-st, 49 – in the 2-nd and 14 – in the 3-rd age group. Mothers in the 3-rd age group compared to those in the 2-nd age group had higher total cholesterol (X=5.98 and X=6.74 mmol/l, $p=0.013$), LDL-chol (X=4.55 and X=3.93, $p=0.03$) and ApoB (X=1.22 and X=1.05, $p=0.03$).

CONCLUSIONS: In the Lithuanian families mothers with self-reported disease had higher MMP-9 concentration compared to fathers. With age differences of the investigated markers between women compared to men increases.
The study is supported by LITGEN Project (VP1-3.1-ŠMM-07-K-01-013).

Cardiovascular disease

Cod: 0323

QUANTIFICATION OF GDF-15 AND ST2S CIRCULATING LEVELS IN CORONARY ARTERY DISEASE PATIENTS: A DIAGNOSTIC TOOL FOR MONITORING HEART FAILURE RISK?

M.M. Corsi Romanelli[2], E. Vianello[1], E.T. Scognamiglio[1], R. Rigolini[3], E. Dozio[1]

[1]*Department of Biomedical Sciences for Health, Universita' Degli Studi Di Milano, Milan, Italy*

[2]*Department of Biomedical Sciences for Health, Universita' Degli Studi Di Milano, Milan, Italy and U.O.C SMEL-1 Clinical Pathology, I.R.C.C.S. Policlinico San Donato, San Donato, Milanese, Milan, Italy*

[3]*U.O.C. SMEL-1 Clinical Pathology, I.R.C.C.S. Policlinico San Donato, San Donato Milanese, Milan, Italy*

BACKGROUND: Heart failure (HF) is a cardiac syndrome characterized by hemodynamic wall stress due to cardiac overload that imposes mechanical and shape dysfunctions leading to compensatory responses culminating in tissue injury. Clinical studies showed that one of the main causes of HF is coronary artery disease (CAD) and about half of all HF patients have HF with preserved ejection fraction (HFpEF). The early diagnosis of HFpEF is often difficult. Natriuretic peptides are recommended mainly for exclusion of HFpEF and not for diagnosis of HFpEF. For these reasons, there is an increased interest to identify new possible circulating markers for early diagnosis of HFpEF. Several studies have shown that the mechanisms that induce HFpEF are related to cardiomyocytes stretch and cardiac fibrosis in which the growth differentiation factor-15 (GDF15) and the soluble isoform of interleukin (IL)-1 receptor (ST2s) are the principal mediators. Indeed both these molecules are highly expressed in cardiomyocytes affected by mechanical stretch that occurs during HFpEF. Our aim was to evaluate whether quantification of GDF15 and ST2s could be a diagnostic tool for monitoring HFpEF risk in CAD patients.

METHODS: We enrolled 20 CAD patients undergoing coronary artery bypass graft surgery and 29 apparently healthy subjects (CTR). Among CAD patients, 8 displayed HFpEF (CAD+HFpEF) and 12 did not show any sign of HEpEF (CAD-HFpEF). GDF15 and ST2s plasma levels were quantified by enzyme-linked immunosorbent assays.

RESULTS: GDF15 plasma level was higher in CAD+HFpEF (2.39 ± 0.57 ng/mL) than CAD-HFpEF (0.82 ± 0.14 ng/mL) and CTR (0.15 ± 0.01 ng/mL). Also plasma level of ST2s was higher in CAD+HFpEF (0.55 ± 0.09 ng/mL) than CAD-HFpEF (0.30 ± 0.04 ng/mL) and CTR (0.18 ± 0.02 ng/mL). CAD-HFpEF patients also displayed increased GDF-15 and ST2s levels compared to CTR.

CONCLUSIONS: Our results suggest that quantification of GDF-15 and ST2s could be a useful tool for monitoring and screening patients with high risk to develop HFpEF, such as CAD patients

Cardiovascular disease

Cod: 0324

STATIN TREATMENT DECREASED PLASMA ASYMMETRIC AND SYMMETRIC DIMETHYLARGININE IN PATIENTS WITH ISCHEMIC HEART DISEASE

V. Ćosić[1], M. Deljanin-Ilić[2], L. Zvezdanović-Čelebić[1], S. Kundalić[1], T. Ristić[1], V. Đorđević[1]
[1]*Centre of Medical Biochemistry, Clinical Center Niš, Serbia*
[2]*Institute for Cardiovascular Diseases Niška Banja, Srbija*

BACKGROUND: Elevated plasma levels of asymmetric dimethylarginine (ADMA) and symmetric dimethylarginine (SDMA) were found in patients with ischemic heart disease. ADMA is a natural competitive inhibitor of nitric oxide synthase (NOS) activity until SDMA has not significant inhibitory effect on NOS. It is known that oxidized LDL cholesterol upregulates synthesis of ADMA as well as that statins increase nitric oxide (NO) levels. Elevated levels of ADMA, present in patients with ischemic heart disease, may modify this effect of statin on NO and may have significant consequences for responsiveness to taking statins on patients.

METHODS: In this study we observed ADMA and SDMA plasma concentration in patients with different types of ischemic heart disease: first group with stable angina pectoris (SAP), second with unstable angina pectoris (USAP) and third with acute myocardial infarction (AMI). All of these groups divided on statin treated group and group of patients without statin therapy. These groups compared mutually and with control group. Plasma concentration of ADMA and SDMA were measured by high-performance liquid chromatography.

RESULTS: In all of patients groups we noted significant elevation in both, ADMA and SDMA compared to control group: ADMA - 0.75±0.28 μmol/L vs. 0.31±0.18 μmol/L; SDMA 1.11±0.19 μmol/L vs. 0.29±0.13 μmol/L; $p<0.001$, with the highest level in USAP group (ADMA 0.94±0.24 μmol/L; SDMA 1.23±0.21 μmol/L). Also, a significant negative correlation between statin treated patient and values of ADMA/SDMA were found in SAP ($p<0.01$), and between SDMA and statin treated patients in AMI. Simultaneously, we noted significant decrease of both parameters in statin treated groups, especially in SAP.

CONCLUSIONS: Decrease under the statin therapy is deeper in SDMA concentration, despite the facts that many investigator have focused mainly on ADMA as a clinical relevant parameter. Considering these findings SDMA showed better clinical accuracy in assessing ischemic disease especially after statin therapy, where it could be used as a valid therapeutic target.

Cardiovascular disease

Cod: 0325

CORRELATION OF CORONARY ARTERY SERUM ADIPONECTIN AND MCP-1 LEVELS IN PATIENTS WITH CORONARY ARTERIAL DISEASE WITH VASCULAR INVOLVEMENT AND CORONARY LESIONS SIZE

C. Coşkun[1], N. Caner Yanık[1], O.O. Genç[2], G. Mutluoğlu[1], O. Kaya[1]
[1]*Kartal Dr. Lütfi Kırdar Training And Research Hospital, Medical Biochemistry Laboratory, Istanbul, Turkey*
[2]*Kartal Kosuyolu Highly Specialised Training And Research Hospital Department Of Cardiology, Istanbul, Turkey*

BACKGROUND: We compared serum adiponectin and MCP-1 levels in CAD with single-vessel involvement (SVI) multi-vessel involvement (MVI) and control group. We investigated the relationship between adiponectin and MCP-1 levels and "SYNTAX score" which shows coronary lesions size and is resulted in angiographic outcomes of patients.

METHODS: 85 patients who admitted with angina symptoms and completed coronary angiographic tests. 22 patients (16 male;6 female) had single-vessel involvement (SVI) and serious coronary arteries lesion (stenosis≥50%); 36 patients (27 male;9 female) had multi-vessel involvement (MVI)and 27 patients (13 male;14 female) were control patients whose coronary arteries are normal. The left main coronary artery (LMCA) and/or ≥2vessel occlusion has observed in MVI patients. Angiographic results of patients Calculation of SYNTAX scores of patient groups has performed by a specially developed program for scoring and patients' angiographic results were available for this procedure. Based on these scores, ≥%50 stenosis was considered statistically significant; lesion scores below 50% excluded.

RESULTS: Adiponectin levels of control group (5.22±3.29μg/ml) with those of single-vessel involvement(SVI) group (3.81±2.21μg/ml) and multi-vessel involvement (MVI) group (3.37±1.87μg/ml), we have found that only multi-vessel involvement (MVI) group's adiponectin levels were significantly different from those of control group (p=0017). Given MCP-1 levels, no significant differences were found between control group (391.96±125.64pg/mL) and SVI (368.80±85.82pg/ml) and MVI(383.64±137.61pg/ml) groups (p>0.05). Multiple Linear Regression analysis revealed that age, BMI, fasting blood glucose, serum creatinine, triglycerides, LDL-C, HDL-C, total cholesterol, adiponectin and MCP-1 are not independent risk factors for SYNTAX score (p=0.343,R^2=0.025).

CONCLUSIONS: Adiponectin levels that provided by these periodically monitoring will be available laboratory findings for probability of future CAD. We believe that serum MCP-1 levels aren't specific analytes for CHD.

Cardiovascular disease

Cod: 0326

LEPTIN AND ENDOTHELIN 1 – A NOVEL LINK BETWEEN EPICARDIAL FAT AND LEFT VENTRICLE HYPERTROPHY

S. Cristina[2], A. Ali[1], B. Syakib [1], W. Andi[2]
[1]*Faculty of Medicine University of Hasanuddin - Indonesia*
[2]*Faculty of Medicine University of Hasanuddin - Indonesia ; Prodia Clinical Laboratory - Indonesia*

BACKGROUND: Obesity has become a global epidemic health problem and is characterized by increased adipose tissue in subcutaneous and visceral depots, including the heart. Among cardiovascular diseases, LVH (Left Ventricle Hypertrophy) constitutes an important indicator of cardiovascular risk. Epicardial fat was significantly associated with increased left ventricular mass, endothelial dysfunction, and other cardiovascular risk. The aim of this study was to propose pathomechanism of deleterious effect of epicardial fat in LVH.

METHODS: Study participants consisted of 74 healthy centrally obese men were consecutively recruited in Jakarta. Anthropometric measurements were done prior to questionnaire in which information on health condition, smoking, physical activities and medication were recorded. Local ethics committee approved the study and written consent was obtained. Fasting glucose, creatinine, Leptin, s-Leptin receptor, 8-Isoprostane and Endothelin-1 (ET-1) were measured using available test kit. Epicardial fat thickness and Left Ventricle (LV) structure were measured with a standard ultrasound machine. LV mass was normalized for body surface area. Relationships between variables were evaluated as well as the independence of the associations was tested.

RESULTS: As expected, by Spearman correlation analysis, significant correlations were found between epicardial fat with Free Leptin Index (FLI) ($r = 0.266$, $p = 0.022$), epicardial fat with ET-1 ($r = 0.402$, $p = 0.000$) and epicardial fat with LV Mass Index (LVMI) ($r = 0.354$, $p = 0.002$). We also found significant relationship between FLI with ET-1 ($r = 0.320$, $p = 0.005$), FLI with 8-Isoprostane ($r = 0.265$, $p = 0.022$), ET-1 and 8-Isoprostane ($r = 0.248$, $p = 0.033$) and ET-1 with LVMI ($r = 307$, $p = 0.008$). Using multiple regression analyses we found out that independent factors affecting LVMI were epicardial fat, ET-1 and 8-Isoprostane, together explaining 24.3 % of LVMI variance. FLI was not independently related to LV mass. Independent correlates of ET-1 were epicardial fat, FLI and 8-Isoprostane.

CONCLUSIONS: The major finding of this study was that epicardial fat had an important role to the pathomechanism of LVH through FLI and ET-1.

Cardiovascular disease

Cod: 0327

ALTERATIONS IN CARDIAC MARKERS IN ACUTE CORONARY SYNDROME

T. Daniela[1]
[1]*Zdravstven Dom Skopje*

BACKGROUND: Acute coronary syndrome is one of the most common causes of morbidity and mortality. The aim of this work is to monitor changes in levels of several cardiac markers.

METHODS: The study included a control group of 35 healthy individuals, and a group of hospitalized 57 patients, at the University Clinic of Cardiology in Skopje, with onset of chest pain 1-9 hours prior to admission. The patient group was subdivided based on the ECG findings: group (n1=32) with ST elevation myocardial infarction (STEMI) and a group (n2=25) with non-ST elevation myocardial infarction (NSTEMI). We used standard methods to analyze the following biochemical parameters: AST, LDH, CK, CK-MB, troponin I, d-dimers, cholesterol, triglycerides, HDL, LDL and CRP.

RESULTS: The following results were obtained: in the control group: AST =18,57±7,26U/L; LDH =155,03±37,9U/L; CK =76,54±25,90U/L; CK-MB =1,33±0,61ng/mL; troponinI =0,20±0,0ng/mL; d-dimers =224,37±158,15ng/mL; cholesterol =4,96±0,95mmol/L; triglycerides =1,10±0,45mmol/L; HDL =1,42±0,39mmol/L; LDL =3,11±0,89mmol/L; STEMI group: AST =150,78±189,63 U/L; LDH =439,62±351,01U/L; CK =781,51±779,32U/L; CK-MB =98,41±145,04ng/mL; troponinI =43,67±60,42ng/mL; d-dimers =342,74±266,99ng/mL; cholesterol =5,77±1,26mmol/L; triglycerides =1,80±0,94mmol/L; HDL =1,10±0,26mmol/L; LDL =3,86±1,13mmol/L and NSTEMI group: AST =63,93±103,84U/L; LDH =247,60±134,10U/L; CK =464,20±855,26U/L; CK-MB =45,48±128,00ng/mL; troponinI =13,88±31,05ng/mL; d-dimers =607,77±778,99ng/mL; cholesterol =4,77±1,37mmol/L; triglycerides =1,71±0,61mmol/L; HDL =0,94±0,26mmol/L; LDL =3,23±1,19mmol/L.

CONCLUSIONS: The results shown statistically significant difference between the control and both STEMI and NSTEMI groups for all inspected parameters, with the exception of cholesterol, LDL and CK-MB-only for the NSTEMI group. We did not observe statistically significant change in the lipid levels and so these analyses could be omitted at admission of patients presenting with chest pain. As conclusion the selected biochemical parameters: AST, LDH, CK, CK-MB, troponinI, d-dimers and CRP are reliable diagnostic markers of acute coronary syndrome.

Cardiovascular disease

Cod: 0328

A NOVEL SYNERGISM BETWEEN TGFß1 AND ADAMTS4 SERUM LEVELS IN CORONARY ARTERY DISEASE: A NEW MECHANISM IN PROGRESSION OF ATHEROSCLEROSIS

S. Çam[4], S. Uluçay [4], M. Batır[4], R. Sütçü[1], Ö. Bayturan[2], K. Demircan[3]
[1]*Department of Biochemitry, Katip Çelebi University School of Medicine, İzmir, Turkey*
[2]*Department of Cardiology, Celal Bayar University School of Medicine, Manisa, Turkey*
[3]*Department of Medical Biology, Turgut Özal University School of Medicine, Ankara, Turkey*
[4]*Department of Medical Genetics, Celal Bayar University School of Medicine, Manisa, Turkey*

BACKGROUND: Coronary artery disease (CAD) that is characterized with atherosclerosis in the vessel wall, is a multifactorial disorder. Recently, it has been thought that increasing LDL binding capability of subendotelial proteoglycans and proteoglycan fragments that was formed by protease activity, can be responsible for initiation of atherosclerosis. ADAMTS4 is a member of versican-degrading proteinases. Elevated serum levels were found in CAD. It was known that these proteainase was cytokine regulated enzyme. In vitro studies demonstrated that TGFß1 inhibited the expression of ADAMTS4 in macrophage. The role of TGFß1 in atherosclerosis is contraversial. In this study, we aimed to investigate the role and correlation of TGFß1 and ADAMTS4 in coronary artery disease.

METHODS: 84 cases with atheroma plaque and 72 controls without plaque, confirmed by coronary angiography, were analyzed. The severity of disease was determined by diseased vessel number and Gensini score. TGFß1 gene rs1800469, rs1800470 and rs4803455 polymorphism were genotyped by the polymerase chain reaction-restriction fragment length polymorphism technique (PCR-RFLP). TGFß1 and ADAMTS4 serum levels were measured by enzyme-linked immunosorbent assay (ELISA) method.

RESULTS: ADAMTS4 levels were higher in cases compared with controls (p=0,001). In patients group, ADAMTS4 levels correlated with TGFß1 serum levels (r=0,29; p=0,007) and severity of disease (r=0,20; p=0,012). ADAMTS4 serum levels were higher in diabetic cases than nondiabetic cases (p=0,05). TGFß1 gene CCA haplotype were associated with a 3,3-fold increase in coronary artery disease (OR=3,26 95% CI 1,22-8,68; p=0,013).

CONCLUSIONS: These results suggested that ADAMTS4 is responsible for the initation and progression of atherosclerosis. To our knowledge this is the first study that a novel synergism between ADAMTS4 and TGFß1 serum levels were presented for the progression of atherosclerosis in CAD and higher serum ADAMTS4 levels was shown in diabetic patients. Furthermore it was shown that TGFß1 haplotype is a genetic susceptibility for CAD in our study population but there was no association between serum TGFß1 levels and initation of atherosclerosis.

Cardiovascular disease

Cod: 0329

GENETIC ANALYSIS OF A COHORT OF BRUGADA PATIENTS USING TARGETED SEQUENCING

C. Di Resta[4], P. Alessandro [2], S. Simone[1], D.B. Paolo[1], D.B. Gianluca[2], F. Maurizio[5], B. Roberta[2], B. Sara[3]
[1]*Department of Arrhythmology, San Raffaele Hospital, Milan*
[2]*Institute of Biomedical Technologies, National Council of Research (ITB-CNR), Milan*
[3]*Laboratory of Clinical Molecular Biology, Diagnostica e Ricerca San Raffaele, Milan*
[4]*Vita-Salute San Raffaele University*
[5]*Vita-Salute San Raffaele University; Laboratory of Clinical Molecular Biology, Diagnostica e Ricerca San Raffaele; Genomic Unit for the Diagnosis of Human Pathologies, Center for Translational Genomics and Bioinformatics, OSR, Milan*

BACKGROUND: Recent developments of next generation sequencing represent a great opportunity to identify new candidate genes in genetically heterogeneous pathologies, such as Brugada Syndrome (BrS). BrS is an inherited cardiac arrhythmogenic disorder with a prevalence of 1:5000 in Western countries, characterized by ventricular instability that may lead to sudden cardiac arrest in asymptomatic adults. To date the predisposition to develop fatal arrhythmias cannot be easily predicted and the defibrillator implant is the only therapeutic choice. Until now BrS genetic background remained mostly unknown, since mutations in known genes cover approximately 30% BrS patients. In our study we aimed at identifying new candidate genes potentially involved in this genetically heterogeneous pathology performing targeted NGS in a cohort of 91 BrS patients.

METHODS: We drew a panel of 158 candidate genes. We used the Agilent SureSelect target enrichment protocol and the sequencing was performed on Illumina GAIIx. To manage the sequencing data, we developed an automated bioinformatics pipeline based on BWA aligner, which is able to map reads versus the hg19 reference.

RESULTS: NGS yielded mean target coverage of 99.16%, with a mean sequencing depth of 327.22x among the samples. We identified a median of 273 protein-coding variations per sample. In order to select and prioritize candidate mutations, we filtered out all variations already known as common polymorphisms within the human population. Overall, we identified 98 novel variants in 71 subjects in a total of 70 genes, including missense, nonsense, splice-site and INDELs, and 33 clinical rs annotated in dbSNP137. To select more promising BS candidate genes, we compared the mutational rate of each gene to that observed in repeated random sampling of healthy controls from 1000 genomes project data.

CONCLUSIONS: Besides confirming an important role for ion channels, our results identified new candidate BrS genes, such as ANK2, RYR2, DSG2, LMNA, previously associated with other forms of inherited cardiopathies and suggesting an overlap between different disorders; however, most patients still remained genetically uncharacterized, prompting more extensive studies and suggesting a possible multigenic aetiology.

Cardiovascular disease

Cod: 0330

PERIOPERATIVE MONITORING OF NEUTROFIL GELATINASE-ASSOCIATED LIPOCAIN MEASURED IN PLASMA IN ADULT PATIENTS AFTER CARDIAC SURGERY AND ASSOCIATION WITH ACUTE KIDNEY INJURY

A. Dimitrova-Karamfilova[1], I. Petrova[1], N. Hristova[1], T. Solarova[1], T. Pencheva[1], C. Hristova[1], G. Tsaryanski[1], S. Peicheva[1], G. Nachev[1]
[1]*UH "St. Ekaterina"*

BACKGROUND: Acute kidney injury (AKI) is a seriously complication of cardiopulmonary bypass (CPB). Clinical investigations have identified several risk factors associated with the development of AKI after CPB, the majority related to either impaired renal perfusion or decreased renal reserve, and have resulted in the development of clinical scoring systems for the prediction of AKI. However, these tools have not been validated across medical centers. The diagnosis of AKI is usually based on changes in serum creatinine, but such measurements are poor early marker of acute deterioration in kidney function. Neutrofil Gelatinase-Associated Lipocain, (NGAL) is proposed as a new biomarkers of AKI rapidly released by renal tubules in response to injury.

METHODS: This study included 84 (59 male and 25 female) adult patients after cardiac surgery. All patients admitted to the hospital were without any kidneney disease. Serial plasma NGAL measurements obtained by particle-enhanced turbidimetric immunoassay (NGAL Test™ BioPorto®Diagnostics). Serum creatinine was measured by the kinetic Jaffe method. All measurements were performed using the ARCHITECT c4000 (ABBOTT Diagnostics). The primary outcome was AKI, defined as a ≥50% increase in serum creatinine.

RESULTS: Plasma with low and high concentrations of NGAL and two control materials were measured with 10 determinations in 3 separate runs. The imprecision was calculated. Less than 5% total CV was obtained in the range 86 to 1376 ng/ml. AKI developed in 26 patients (31%), but the diagnosis using serum creatinine was delayed by 2 to 4 d after CPB. In contrast, mean pasma NGAL levels increased 2-4 fold within 2 h and by 2-6 fold at 12 h after CPB. For the 2-h and 12-h plasma NGAL measurement, the area under the curve was 0.81 and 0.998 respectively. Positive predictive value was 70% at 2- h and 96% at 12-h, Negative predictive value was 87% at 2-h and 100% at 12-h for prediction of AKI using a cutoff value of 422 ng/ml and 300 ng/ml.

CONCLUSIONS: Our data indicated that plasma NGAL can be early biomarker of AKI immediately after CPB. NGAL demonstrated a better diagnostic value to predict the AKI at the 12- h than 2- h after CPB.

Cardiovascular disease

Cod: 0331

THE IMPORTANCE OF REFERENCE CHANGE VALUE (RCV) TO EVALUATE THE CHANGES WITHIN REFERENCE VALUE OF CARDIAC TROPONIN I (CTNI) ASSAY

G. Saydam[1], N. Dincel[1], E.D. Akbulut[1]
[1]*Türkiye Yüksek İhtisas Education and Research Hospital, Department of Clinical Biochemistry, Ankara, Turkey*

BACKGROUND: Recently it was recommended that evaluation of analyte concentrations together with Reference Change Values (RCV) in order to aid the interpretation of changes in these analyte levels. Reference Change Values of analytes are determined by using the biological and analytical variations. In this study we aimed to evaluate the % increases of cTnI within reference value together with the RCV for the patients suspected for acute myocardial infarction (AMI) diagnosis.

METHODS: Analitical Variation (CVa) of cTnI was calculated using 20 consecutive Internal Quality Control data. The value of intra-individual variation (CVi) for cTnI was obtained from Westgard's Specifications for Biological Variation. Troponin I test was analysed by using Advia Centaur CP TnI-Ultra assay (Siemens) based on chemiluminescence immunoassay technology. The reference change value (RCV) was calculated by the following formula: RCV=(2)1/2 *Z * (CVa2 + CVi2)1/2. cTnI results of patients with chest pain ordered for AMI diagnosis and having first and second results within the reference value were included in the study retrospectively. Increases (%) between these serum samples of each patient were calculated.

RESULTS: The RCV for cTnI was 41.9%. While 70% of patients who had % increase between first and second samples exceeded the RCV had a diagnosis of AMI 30% did not have a diagnosis of AMI.

CONCLUSIONS: We suggest that evaluation of % increases between consecutive cTnI results within the reference value should be done comparing with RCV for the diagnosis of AMI. Therefore we recommend that cTnI results should be reported with the RCV.

Cardiovascular disease

Cod: 0332

DETECTION OF CIRCULATING PROTEINS AND MARKERS OF OXYGEN DEFICIT

S. Domazetovska[1], M. Vavlukis[2], E. Petrovska[1], S. Biljali[1], D. Janicevic Ivanovska[1], S. Kuzmanovska[1], M. Grozdovska Naumoska[1]
[1]*PHI UC of Clinical Chemistry*
[2]*UC for Heart Diseases*

BACKGROUND: Persistent quest for cell response to a stress provoked by different origin, leads to investigation of models which can assure enough date. Heart tissue ischemic events with high prevalence of morbidity is one of the most research area. So far, troponin, along with CK-MB provides reliable information in diagnosis of acute myocardial infarction. Introduction of heat shock proteins (HSP70) as molecular chaperons of processes which prevent further cell integrity destruction, shows better view to a situation. This study was aimed to distinguish diagnosis and presuppose prognosis at patients admitted to emergency room (ER) with symptoms for acute coronary syndrome (ACS).

METHODS: Beside usually used parameters, samples of 200 patients were tested for troponins, myoglobin and HSP 70. Troponin and myoglobin were detiminate with ECLIA (ElectroChemiLuminiscenceImmunoAssay - Elecsys 2010) and HSP70 with ELISA (EnzymeLinkImmunoSorbentAssay) method. Estimated results for parameters determinate at patients from ER were statistically compared to results received by testing samples from healthy blood donors as control group (C).

RESULTS: Presence of oxygen stress was confirm as elevated level of HSP 70 at patients diagnosed with AIM (26,3 times-fold vs. C) and unstable angina (15,1 times- fold vs. C). Those results implicate that during this condition, cell engage mechanisms and processes for cell integrity protection and its components. In our opinion this is also confirm with elevated reactive proteins level (8,5 times- fold vs C) and its regulation in a few weeks, if there is not any adverse events. In other experiment this can be supported by measuring number or level of cell involved in immune-response and production of specific antibodies which can help laboratory workers and physicians in modeling the protocols.

CONCLUSIONS: The results of this study fulfill expectation in diagnostic and prognostic value of HSP70 and further treatment of patients suffering ACS. Due to long lasting procedure and compare to results received for the troponins, our suggestions goes to use of specific proteins as diagnostic parameters at very first moment. HSP determination has its importance in follow up of the patients suffering ACS.

Cardiovascular disease

Cod: 0333

LABORATORY METHOD OF EVALUATING THE EFFICIENCY OF THROMBOLYTIC THERAPY IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

V. Dorofeykov[1], V. Ivanov[2], O. Kunina[2], N. Burova[2]
[1]*D. O. Ott Research Institute of Obstetrics and Gynecology, Saint-Petersburg, Russia*
[2]*Federal Almazov Medical Research Centre, Saint-Petersburg, Russia*

BACKGROUND: The aim of this study was to develop a laboratory method of evaluating the efficiency of thrombolytic therapy (TLT) in patients with acute transmural myocardial infarction (Q-infarction).

METHODS:27 patients (54±2 years old) admitted to the hospital the first 6 hours after the onset of myocardial infarction received TLT. Blood sampling was done at the beginning of TLT and every hour within next 8 hours. Measurement of Troponin I (TnI) level was performed using analyzer "Architect i2000" (Abbott). All patients received Prourokinase. The effectiveness of thrombolytic therapy was evaluated by standard electrocardiograph criteria. Spearman rank R, Kendall Tau, and Gamma were computed.

RESULTS: Thrombolysis was not effective in 26% of patients. During the procedure of thrombolysis blood flow in the damaged artery is being instantly restored. That leads to a large number of tissue proteins from the damage zone getting into the bloodstream, the most specific of which is the TnI. Time constrains are individual. With a small probability of error (less than 0.0027) it could be argued that in patients with TnI concentration increasing during TLT 10 times and more in 60 minutes satisfactory treatment results rates are significantly higher than in patients with a smaller increase of TnI level. The time to reach such an increase of TnI concentration did not exceed 2 hours from the moment of the beginning of TLT in 86.8% of cases. Measuring the level of the marker after 4 hours from the start of TLT gave no useful information.

CONCLUSIONS: Effectiveness of TLT can be assessed using the criterion of TnI level increasing tenfold and more in one hour.

Cardiovascular disease

Cod: 0334

ENDOTHELIAL PROGENITOR-LIKE CELLS AS A DIAGNOSTIC MARKER FOR ANGINA PECTORIS

Y. Kim[1], S. Kim[1], H.J. Kwon[1], H.K. Lee[1], Y. Kim[1], J. Lee[1]
[1]*Department of Laboratory Medicine, College of Medicine, The Catholic University of Korea, Seoul, Korea*

BACKGROUND: There have been no cardiac markers for the diagnosis of angina pectoris. We assessed if CD133 positive, CD309 positive, CD34 positive, CD11a positive and CD184 positive cells could be diagnostic marker of angina pectoris.

METHODS: A total of 48 subjects (from 20 healthy individuals, 12 patients with angina pectoris, and 16 patients with myocardial infarction) were included and mononuclear cells were isolated from EDTA peripheral blood by density gradient centrifugation through Ficoll-Paque. Mononuclear cells were stained using 5 different antibodies for CD133, CD309, CD34, CD11a and CD184, and at least 500000 cells were examined using 6-color flow cytometer.

RESULTS: There was no significant difference in the population size of $CD133^{+}$-$CD309^{+}$-$CD34^{+}$ cells between the three groups. However, the population size of $CD133^{weakly+}$-$CD309^{weakly+}$-$CD11a^{weakly+}$ cells were significantly different between the healthy individuals and two patient groups. In healthy individuals, 95.9%±1.7% of mononuclear cells was $CD133^{-}$-$CD309^{-}$ cells and 2.7%±1.3% was $CD133^{weakly+}$-$CD309^{weakly+}$ cells. Population size of $CD133^{weakly+}$-$CD309^{weakly+}$ cells was significantly increased in the patients with angina pectoris or myocardial infarction. Mean population size of $CD133^{-}$-$CD309^{-}$ cells in the patients with angina pectoris was 85.5% and that of $CD133^{weakly+}$-$CD309^{weakly+}$ cells was 12.0%. Mean population size of $CD133^{-}$-$CD309^{-}$ cells in the patients with myocardial infarction was 81.7% and that of $CD133^{weakly+}$-$CD309^{weakly+}$ cells was 13.4%. Most of $CD133^{weakly+}$-$CD309^{weakly+}$ cells in the healthy individuals showed strong expression of CD11a, but most of $CD133^{weakly+}$-$CD309^{weakly+}$ cells in the patients with angina pectoris or myocardial infarction had weakly expression of CD11a.

CONCLUSIONS: $CD133^{weakly+}$-$CD309^{weakly+}$-$CD11a^{weakly+}$ cells with help of cardiac troponins could be a useful marker in the differential diagnosis of angina pectoris from healthy individuals and myocardial infarction.

Cardiovascular disease

Cod: 0336

STUDY ON RELATIONSHIP BETWEEN DEEP VEIN THROMBOSIS AND HOMOCYSTEINE, VITAMIN B6, VITAMIN B12 AND FOLIC ACID LEVELS

M. Ekim[2], H. Ekim[1], Y.K. Yılmaz[1], M.F. Polat[1], B. Külah[1], Y. Göçmen[1]
[1]*Bozok University, School of Medicine*
[2]*Bozok University, Shool of Health*

BACKGROUND: Venous thromboembolism (deep venous thrombosis and/or pulmoner embolism) is the third most common vascular disease after myocardial infarction and ischemic stroke. Among the risk factors of deep venous thrombosis, hyperhomocysteinemia has been considered as a potential factor by most studies, but is still controversy. The aim of our study is to evaluate the prevalence of hyperhomocysteinemia in Turkish patients with DVT and to investigate the effects of folate, vitamin B6, and vitamin B12 concentrations on homocysteine levels and development of DVT.

METHODS: A total of 60 patients with deep venous thrombosis aged from 23 to 84 years, were assessed regarding demographic characteristics, serum levels of homocysteine, folate, vitamin B12, and vitamin B6. Blood samples were gathered and analyzed according to standard methods.

RESULTS: Mean serum homocystein levels were significantly higher in older patients (10.81 μmol/L) than younger patients (9.13 μmol/L). Of the 60 patients, 9 patients had homocysteine level above the cut-off point of 15 μmol/L, 26 had folic acid level below the cut-off point of 3 ng/ml, one had vitamin B12 level below the cut-off point of 150 pmol/L, and one had vitamin B6 level below the cut-off point of 30 nmol/L. In the hyperhomocysteinemic group, five patients had low folic acid level, one had low vitamin B12 level, and one had low vitamin B6 level.

CONCLUSIONS: Our findings confirm that hyperhomocysteinemia may be a risk factor for DVT, more prevalent in the patients with low folic acid level. Further studies are required to clarify the molecular mechanisms underlying homocysteine-induced thrombosis and to test the clinical effects of reduced total homocysteine levels.

Cardiovascular disease

Cod: 0337

EVALUATION OF SERUM VASPIN (VISCERAL ADIPOSE TISSUE-DERIVED SERPIN LEVELS) IN CORONARY ARTERY DISEASE

N. Eren[2], S. Cigerli[2], H. Kocyigit[2], F. Turgay[2], C. Kırma[1], B. Aslan[2], O. Koca[2]
[1]*Koşuyolu Cardiovascular Surgery Research and Training Hospital, Istanbul, Turkey*
[2]*Sisli Etfal Research and Training Hospital, Department of Biochemistry, Istanbul, Turkey*

BACKGROUND: Vaspin, is an adipocytokin that is secreted by visceral adipose tissue. Serum vaspin concentrations and increased vaspin mRNA expression in adipose tissue were found to be related to obesity, insulin resistance and type 2 diabetes in humans. Since obesity is closely related to accelerated atherosclerosis, the relationship between serum vaspin concentrations and coronary artery diseases (CAD) was investigated.

METHODS: This study consisted of 77 cases (n=24 female and n=53 male) who were referred to a coronary angiography laboratory as a result of myocardial ischemia signs and symptoms observed in exercise test or myocardial perfusion scintigraphy. Patients were separated into two groups according to their angiography results: Patients with (Group 1 n=49) and without CAD (Group 2, n=28). Serum vaspin concentrations were measured in both groups by using the ELISA method (AdipoGen HumanVaspin,). CAD risk factors, hsCRP, homocystein, insulin, were also measured using Olympus AU 2700, Immulite 2000 and Advia Centaur XP analysers, respectively. BMI and HOMA-IR values are calculated.

RESULTS: Mean serum vaspin concentrations in Group 1 and 2 were 0.15 ng/mL and 0.08ng/mL, respectively. The difference in vaspin concentrations was statistically insignificant ($p>0.05$). Difference between homocystein (Group 1: 12.97, Group 2: 11.45 umol/L) and hsCRP (Group 1: 5.88, Group 2: 5.04 mg/L) concentrations, and HOMA-IR score (Group 1: 5.12 Group 2: 3.31) were also insignificant. However, in both groups, all parameters were higher than the upper limit of the reference range. Positive correlations were observed between vaspin and hsCRP ($p<0.05$; r:0.421), and HOMA-IR ($p<0,05$; r:0,220).

CONCLUSIONS: Vaspin concentrations in patients Group 1 and 2 were not significantly different. Presence of patients with diabetes mellitus, dyslipidemia and high hsCRP concentrations might be a reason for this insignificant difference. Since vaspin concentrations shows positive correlations with CAD risk factors, hsCRP and HOMA-IR, it is worthwhile to design new studies using control groups that are free from clinical conditions known to increase vaspin concentrations.

Cardiovascular disease

Cod: 0338

SERUM LEVELS OF GALECTINE-3 AND N-TERMINAL PRO-BRAIN NATRIURETIC PEPTIDE: CORRELATION WITH LATE GADOLINIUM ENHANCEMENT IN HYPERTROPHIC CARDIOMYOPATHY

L. Erroi[2], D. Cosseddu[2], K. De Rosa[1], T. Forni[1], S. Bongioanni[1], B. Mabritto[1], I. Rodolico[2], S. Musolino[2], R. Ronchi[2], M.R. Conte[1], M. Migliardi[2]
[1]*Cardiology Department, Umberto I Mauriziano Hospital, Turin, Italy*
[2]*Clinical Laboratory Department, Umberto I Mauriziano Hospital, Turin, Italy*

BACKGROUND: Galectine-3 (Gal-3) is a recently discovered marker for myocardial fibrosis and its circulating levels are a powerful predictor of outcome in both acute and chronic heart failure (HF). Cardiac magnetic resonance (CMR) with late gadolinium enhancement (LGE) can identify the presence of fibrosis areas in patients with Hypetrophic Cardiomyopathy (HCM). Aim of our study was correlate Gal-3 and N-terminal pro-Brain Natriuretic Peptide (NT-proBNP) serum levels with LGE in CMR results of a cohort of patients affected by HCM.

METHODS: A total of 38 patients with HCM (60.5% males; mean age 51±17.8 years) were enrolled. Circulating levels of Gal-3 and NT-proBNP were measured using commercial assays (VIDAS® Biomérieux). The study was approved by Ethic Committee and all patients gave written informed consent.

RESULTS: Sixteen patients (42.1%) were asymptomatic (NYHA class I); twenty (52.6%) were NYHA class II and two (5.3%) were NYHA class III. Gal-3 median and (range) serum levels were 9.9 ng/mL (4.3-22.0) and the only patient with medium/high Gal-3 (22 ng/mL) showed a creatinine of 1.4 mg/dL. Gal-3 levels were not significantly different between NYHA II and asymptomatic patients. On the contrary, for NT-proBNP levels significant difference was observed between asymptomatic and NYHA II patients ($p<0.02$). NT-proBNP and creatinine median and (range) serum levels were respectively 530 pg/mL (25-5532) and 0.90 mg/dL (0.60-1.40). No correlation was observed between Gal-3 and LGE: $r=0.144$, $p=0,503$ and also between NT-proBNP and LGE: $r=0.217$, $p=0.307$.

CONCLUSIONS: In a population of HCM patients with NYHA class I and II there is no correlation between Gal-3 and NT-proBNP levels with LGE percentage in CMR. Only one patient had medium/high Gal-3, but his serum creatinine confirms a mild renal failure. In order to investigate whether high levels of Gal-3 and NT-proBNP correlate with LGE we will continue our study including NYHA class III-IV.

Cardiovascular disease

Cod: 0339

THE CUT-OFF VALUE OF ULTRASENSITIVE TROPONIN I FOR DIAGNOSIS OF ACUTE MYOCARDIAL INFARCTION

T. Esen[1], S. Kant[1], Y. Yazıcı[3], U. Uçar[1], G. Kırış[2], H. Yaman[4]
[1]*Ahi Evren Chest, Heart and Vascular Surgery Hospital, Biochemistry Department, Trabzon, Turkey*
[2]*Ahi Evren Chest, Heart and Vascular Surgery Hospital, Cardiology Department, Trabzon, Turkey*
[3]*Ahi Evren Chest, Heart and Vascular Surgery Hospital, Microbiology Department, Trabzon, Turkey*
[4]*Karadeniz Technical University Faculty of Medicine Department of Biochemistry, Trabzon, Turkey*

BACKGROUND: Cardiovascular disease, acute myocardial infarction which are the major health problems in humans. Cardiac troponins are important biomarkers for diagnosis of myocardial infarction because of their high sensitivity and specificity for myocardial injury. However according to the different measurement technics there are different cut-off values for Troponin I. We aimed to determine the cut off value of troponin I in our laboratory.

METHODS: We conducted a study to examine the diagnostic accuracy of sensitive cardiac troponin assays performed on blood samples obtained in the emergency department from 522 consecutive patients who presented with symptoms suggestive of acute myocardial infarction. Cardiac troponin levels were determined with the use of sensitive assays (Siemens Troponin I Ultra). The 86 of 522 patients were diagnosed as acute myocardial infarction according to the clinical features, ECG findings and cardiac markers were evaluated by cardiologists. We evaluated the clinical performance of ultrasensitive cardiac troponin I assay (cTnI) on the ADVIA Centaur system (TnI-Ultra). We intended to determine cut-off values of ultrasensitive cardiac troponin I according to clinical performance with ADVIA Centaur system.The cut-off values that show the optimum sensitivity and specificity were determined by Receiver Operator Characteristic analysis.

RESULTS: According to the Receiver Operator Characteristic analysis, 83.7% sensitivity and 87.6% specificity were found when we used 0.054 ng/mL as the cut-off value, as quantified by the area under the receiver-operating-characteristic curve (AUC) for troponin I 0.91 (95% confidence interval [CL], 0.88 to 0.93).When we used 0.04 ng/mL, 86% sensitivity, 80.7% specificity were found and 80.2% sensitivity, 87.8% specificity were found for 0.06 ng/mL.

CONCLUSIONS: Troponin I cut-off value for acute myocardial infarction diagnosis was determined as 0.054 ng/mL in our laboratory. However, each laboratory needs to determine appropriate cut-off value for their patient population

Cardiovascular disease

Cod: 0340

BRAIN NATRIURETIC PEPTIDES (NT-PROBNP) IN PATIENTS WITH PAROXYSMAL ATRIAL FIBRILLATION

M. Fedorova[1], E. Pavlovskaya[1], A. Roytman[1], V. Dolgov[1], A. Avtandilov[1], N. Abrashkina[1]
[1]*Russian Medical Academy of Postgraduate Education (RMAPO), Moscow*

BACKGROUND: Natriuretic hormones are secreted in response to increased of myocardium walls pressure and resulted vasodilatation, increased diuresis, enhancing of natriuretic hormone concentrations and worsening the dysfunction of left ventricle (LV). In general, the increasing of natriuretic peptides values in atrial fibrillation (AF) is used for diagnosis of heart failure (HF) and LV dysfunction. In the present study, we analyzed the dynamics of NT-proBNP values in patients with paroxysmal AF.

METHODS: The study included 50 patients, mean age 66.5 years (51-82 years) admitted with ischemic heart disease and paroxysmal AF. In all patients electrocardiogram (ECG) were tested and the levels of NT-proBNP were measured in blood samples. After the relief of the paroxysm in the first 3 days the Holter ECG monitoring was performed during 24 hours and after that the patients were subdivided into 2 groups. Group 1 consisted the patients (n=33) without registered recurrent violations of rhythm as a paroxysmal AF. Group 2 consisted the patients (n=17) with recurrent paroxysmal AF with the duration from a few minutes to 1 h. Additionally, the size of the left atrium (LA), left ventricular ejection fraction (EF), the size of the left atrium (LA) and the pressure in the pulmonary artery (PA) were evaluated after the ECG study.

RESULTS: In the first group of patients NT-proBNP values were 520 pg/ml, the LA size LA - 43.5 mm, EF – 59.8% and the pressure in PA - 28,1 mm Hg. In the second group of patients with the same values of LA (43.4 mm), there was the increase in PA pressure to 32 mm Hg ($p < 0.05$), the EF was - 62,3% ($p < 0.05$), and NT-proBNP value was 1033 pg/ml ($p < 0.001$).

CONCLUSIONS: It is shown that in patients with persistent AF there are the marked increase of NT-proBNP levels . However, almost double increase of NT-proBNP values in group 2 compared to group 1 was associated with the recurrent paroxysmal AF, which was accompanied by the increase of pressure in PA as the consequence of the increased pressure in the LA.

Cardiovascular disease

Cod: 0341

GENETICS OF THE SPHINGOLIPID METABOLISM IN HYPERTENSION

M. Fenger[1]
[1]*University Hospitals of Copenhagen, Denmark*

Essential hypertension refers to hypertension with no known cause accounting for 90-95% of all hypertensive subjects and is a major risk factor for stroke, heart disease, and end-stage renal disease. Hypertension is a polygenic disease and as such is supposed to harbour several genetic defects as the causative agents, but so far only a few potential genes have been identified. The major reasons for this modest progress are the unresolved physiologically heterogeneity of the disease and the prevailing monogenic approach to identify genes of importance. The physiologically heterogeneity was resolved by partition of the study population by combined latent class analysis and structural equation modelling into an ensemble of physiological more homogeneous subpopulations. Two-gene interactions were evaluated by variance decomposition and a new weighted mutual information score. The latter analytical approach considerably reduced the number of significant interactions detected by variance decomposition. It was established that the sphingolipid metabolic network is of significant importance in regulating the blood pressure. In particular, acid ceramidase and sphingosine kinase 1 are the hubs collating the genetic information of blood pressure regulation.

Cardiovascular disease

Cod: 0342

CLINICAL VALUE OF GALECTIN-3 IN HOSPITALIZED PATIENTS WITH ACUTE HEART FAILURE

A. García-Narbón[2], T. Casas-Pina[2], M.T. Perez-Martinez[1], M.R. Gracia-Ródenas[1], M. Martínez-Villanueva[2], D. Pascual-Figal[1], J.A. Noguera-Velasco[2]
[1]*Cardiology Service, Clinical Universitary Hospital Virgen de la Arrixaca, Murcia, Spain*
[2]*Clinical Laboratory Service, Clinical Universitary Hospital Virgen de la Arrixaca, Murcia, Spain*

BACKGROUND: Acute Heart failure (AHF) is a leading cause of morbidity and mortality worldwide and, despite recent advances in therapy, AHF hospitalization rates remains unacceptably high. Galectin-3 (Gal-3), a β-galactoside-binding lectin secreted from macrophages, is a novel biomarker for the management of patients with heart failure. In AHF patients, high levels of Gal-3 (>17.8 ng/mL) upon discharge are associated with higher risk for adverse events. We aim to study the utility of serial measures of Gal-3 in AHF patients.

METHODS: We studied 111 patients admitted with AHF (60% male, 71±11 years, LVEF 41±15%). Blood samples were obtained at the arrival to the emergency department, at discharge (median 7 days) and 30-days after discharge. Gal-3 was measured by enzyme immunoassay of Biomerieux®. Patients were followed (453±517 days) and the occurrence of death and HF readmission were registered.

RESULTS: Levels of Gal-3 (ng/mL) were: 20.6±11.8 at admission, 19.2±8.1 at discharge and 19.9±11.7 at 30-days. Considering the threshold of 17.8 ng/mL, 46% of patients were over this level at admission, 45% at discharge and 46% at 30-days. The repeated measures analysis revealed that Gal-3 levels did not change significantly between the three time points (p=0.726). A total of 25 (22.5%) patients died, 40 (36%) were readmitted with AHF and 53 (48%) had any adverse event. Cox regression analysis showed that patients with Gal-3>17.8 ng/mL at admission had a higher risk of HF readmission or death (HR 2.17, 95%CI 1.25-3.77, p=0.006). After the multivariable adjustment, Gal-3>17.8 ng/mL at admission remained as predictor of adverse events (HR 2.02, CI95% 1.14-3.57, p=0.015), but Gal-3 at discharge (p=0.069) or 30-days (p=0.575) did not reach statistical significance.

CONCLUSIONS: In patients with AHF, Gal-3 at admission identified a more adverse phenotype, with higher risk of death or HF readmission. Gal-3 levels did not change in the first month, and serial measures did not add prognostic information over a single measure at admission.

Cardiovascular disease

Cod: 0343

DETERMINING THE 99TH PERCENTILE REFERENCE INTERVAL FOR THE BECKMAN CARDIAC TROPONIN I ASSAYS

D.C. Gaze[2], C.A. Hodges-Savola[1], D.R. Holmes[1], S.A. Faye[1], J.M. Tubman[1], P.O. Coillinson[2]
[1]*Beckman Coulter, Inc. Chaska, MN, USA*
[2]*Chemical Pathology, Clinical Blood Sciences, St George's Hospital London UK*

BACKGROUND: We sought to determine the 99thpercentile upper reference limit of the newly released AccuTnI+3 and the pre-commercial prototype hs-cTnI assay.

METHODS: Serum samples (n=1000) were obtained following routine testing from apparently healthy donors. Subjects were selected on the basis of the following criteria: >40 years old with normal serum urea and electrolyte concentrations, liver function tests, glucose and N-terminal pro-B-type natriuretic peptide. Age and gender were also recorded. Serum samples were stored frozen at -70^{o}C until batch analysis of cTnI using the AccuTnI+3 and pre-commercial high-sensitivity cTnI (hs-cTnI) assay for the Access2 and AccuTnI+3 on the UniCel DxI Immunoassay system (Beckman-Coulter, Chaska, MN). The manufacturers report a total %CV of 5-7% in the range 7-56,360ng/L with a European 99thpercentile of 40ng/L and a US 99th percentile of 20ng/L for the AccuTnI+3 assay.

RESULTS: Two subjects were removed from the study due to inadequate sample volume leaving a population of 998 comprising 433(43%) males and 565(57%) females. The median age was 59.0 years, interquartile range 57.4-60.3 years. There was no significant difference in age between males and females (p=0.4063). There was a good correlation between the AccuTnI+3 concentrations obtained on the two instruments (r=0.90, 95%CI=0.89-0.91). However, the 99th percentile upper reference limit were statistically different at 41 and 34ng/L(P=<0.001) for the Access2 and DxI AccuTnI+3 respectively. Detectable concentrations were observed in 88% of samples on the Access2 but only in 58% on the DxI. Concentrations in males were significantly higher than females using both instruments. The prototype hs-cTnI 99th percentile was 27ng/L on the Access2 with detectable concentrations in 98% of subjects. Concentrations of cTnI in males were significantly higher than females.

CONCLUSIONS: The AccuTnI+3 and prototype hs-cTnI 99thpercentile concentrations are similar to other contemporary and high-sensitive cTnI assays. Differences were seen between the Access 2 and DxI instruments. As gender differences were observed in the reference population, further prospective studies in chest pain patients are required to assess the clinical utility of gender specific 99th percentile vales.

Cardiovascular disease

Cod: 0344

GALECTIN-3 IN PATIENTS WITH ACUTE HEART FAILURE – PRELIMINARY REPORT

S. Grażyna[2], T. Mariusz[1], K. Łukasz [1], B. Sławomir[2], F. Krzysztof J.[1], S. Dariusz[2]
[1]*1st Department of Cardiology, Medical University of Warsaw, Poland*
[2]*Department of Medical Laboratory Diagnostics, Medical University of Warsaw, Poland*

BACKGROUND: Galectin-3 (Gal-3) is a soluble β-galactoside-binding protein expressed by activated macrophages and involved in numerous pathological processes, including inflammation, tumor growth and fibrosis. Numerous experimental studies have shown the important role of Gal-3 in cardiac remodelling due to fibrosis, independent of the fibrosis aetiology. Gal-3 as a biomarker of fibrosis and inflammation, has been implicated in development and progression of heart failure (HF) and predicts increased morbidity and mortality in the society. In this preliminary report we investigated the utility of a novel serum marker for the diagnosis of acute HF.

METHODS: 14 acute HF patients aged 67.0±14.6 yrs with left ventricular ejection fraction (LVEF) 29.29±10.73%, hospitalised at the intensive coronary care unit and 19 patients from a control group at the age of 49.6±10.1 yrs underwent the research. In the study group the concentrations of Gal-3, NT-proBNP, hsCRP and basic clinical parameters, such as prevalence of dyspnoea, LVEF were determined. The concentration of Gal-3 in serum was examined by an automated quantitative test (VIDAS® Galectin-3, bioMerieux SA) using the ELFA technique.

RESULTS: The median (IQR) Gal-3 concentrations in patients with acute HF were higher (nearly 2.1-times) than in the control group (17.75 (10.3-27.8) ng/mL vs 8.4 (6.9-10.6) ng/mL; $p < 0.001$). In our study group the median (IQR) of concentrations of NT-proBNP 4723 (1415-29725) pg/mL and hsCRP 11.75 (5.85-19.95) mg/L were observed. In those patients the statistically significant correlation (Spearman rank-correlation coefficient) between concentrations of Gal-3 and NT-proBNP ($Rs = 0.565$; $p < 0.05$) as well as the value of LVEF and the concentration of hsCRP ($Rs = -579$; $p < 0.05$) were stated.

CONCLUSIONS: Higher expression of Gal-3 is an indicator of myocardial fibrosis and remodelling in decompensate HF. Therefore, Galectin-3 seems to be an interesting and valuable marker of acute HF.

Cardiovascular disease

Cod: 0345

CREATINE KINASE-MB RELATIVE INDEX IN PATIENTS WITH MYOCARDIAL INFARCTION

F. Gun[1]
[1]*Department of Biochemistry, Selcuk University, Faculty of Medicine*

BACKGROUND: In patients with suspected acute myocardial infarction (AMI), serial measurement of serum creatine kinase (CK), troponin and CK-MB isoenzyme levels is standard for establishing the diagnosis of AMI. Typical criteria for the diagnosis of AMI require the presence of total CK elevated above normal with a simultaneously elevated MB isoenzyme level and MB relative index (MBRI) within 24 hours of symptom onset. In this study our aim was to compare the predictive values of creatine kinase-MB fraction (CK-MB), troponin, total CK to creatine kinase-MB relative index (CK-MB RI) for diagnosing acute myocardial infarction (AMI).

METHODS: 68 patients with acute myocardial infarction and 67 control subjects were enrolled in this study. Blood samples were collected from emergency department. Separated serum samples were analyzed on Abbott C8000 autoanalyzer and Siemens Advia Centaur XP for creatine kinase (CK) and troponin and creatine kinase MB (CK-MB), respectively. The relative percent index of CK-MB is calculated using the following equation. Relative % index = CK-MB value (ng/mL)/ CK-MB value (ng/mL)x100

RESULTS: Mean ages for control and patient group were 47±2 and 53±2 years, respectively (p=0.098). Serum creatinine kinase levels were significantly higher in patient group (504±787 U/L) compared with control group (112±123 U/L) (p<0.001). Serum creatinine kinase-MB levels were significantly higher in patient group (33.9±6.08 ng/mL) compared with control group (1.55±1.03 ng/mL)(p<0.001). Serum creatinine kinase-MB relative index was significantly higher in patient group (16.4±31.7) compared with control group (2.40±2.90)(p<0.001). 18 of 68 (26%) patients were found to be negative (under 2.5 cut-off). 17 of 67 (25%) patients were found to be positive (over 2.5 cut-off).

CONCLUSIONS: In the setting of an elevated CK, an elevated ratio of CK-MB to total CK will aid in the differentiation of skeletal muscle injury and myocardial injury. In our opinion, CK-MB relative index has improved specificity and positive predictive value of in ED patients with suspected AMI, relative to the absolute CK-MB.
Keywords: CK-MB relative index, acute myocardial infarction

Cardiovascular disease

Cod: 0346

MONOCYTE CHEMOATTRACTANT PROTEIN-1 (MCP-1) AND PARAOXONASE-1 (PON1) LEVELS IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA SYNDROME

F. Hanikoglu[1], S. Ozben[2], N. Huseyinoglu[2], A. Cort[1], S. Ozdem[1], T. Ozben[1]
[1]*Department of Biochemistry, Medical Faculty, Akdeniz University, Antalya, Turkey*
[2]*Department of Neurology, Medical Faculty, Kafkas University, Kars, Turkey*

BACKGROUND: Obstructive sleep apnea syndrome (OSAS) is an increasing major health concern affecting approximately 5% in the adult population. In several studies OSAS have been shown to increase cardiovascular morbidity and mortality. High systemic oxidative stress and systemic inflammation in OSAS have been considered as a major pathogenic mechanism leading to cardiovascular disease. PON1 is synthesized in the liver and transported within HDL in the plasma. It functions as an antioxidant and prevents oxidation of LDL. Its serum concentration is influenced by inflammatory changes and levels of serum oxidised-LDL. MCP-1 is produced by a variety of cell types, either constitutively or after induction by oxidative stress. Several studies have linked MCP-1 to cardiovascular disease. There is limited information about plasma MCP-1 and PON1 levels in OSAS. Therefore, we aimed to evaluate MCP-1 and PON1 levels in OSAS.

METHODS: 13 moderate OSAS and 45 severe OSAS patients diagnosed with polysomnograhpy (Apnea-Hypopnea index(AHI) >15 events/hour), and 25 healthy volunteers were enrolled in our study. Samples were collected after overnight fasting. MCP-1 is studied with an enzyme-linked immunosorbent assay method (eBioscience). Paraoxonase-1 (PON1) values were measured with a spectrophotometric method.

RESULTS: PON1 values were lower in both of OSAS groups. PON1 values were significantly higher in the control group compared to the severe OSAS group (p=0,019), conversely MCP-1 values were higher in the moderate and severe OSAS groups compared to the controls (500±146,1 pg/ml, 599,3±416,9 vs 485,4±153,8 pg/ml, respectively).

CONCLUSIONS: Increased MCP-1 values in OSAS demonstrates the presence of high oxidative stress and inflammation. On the other hand, decreased PON1 values in the OSAS patients indicate impaired anti-oxidant and anti-atherogenic defense since PON1 plays an important role as an anti-oxidant and anti-atherogenic molecule. In this respect, we suggest measurement of PON1 and MCP-1 levels as useful markers to predict cardiovascular morbidity risk in OSAS patients.

Cardiovascular disease

Cod: 0347

IS THERE AN ASSOCIATION BETWEEN CD14 C-260T POLYMORPHISM AND THE INCIDENCE OF ACUTE MYOCARDIAL INFARCTION IN EGYPTIAN POPULATION?

I. Hashad[1], N. Hossny[1], M. Abdel Rahman [1], S. Abdel-Maksoud[1], M. Gad[1]
[1]*German University in Cairo*

BACKGROUND: Cardiovascular disease is the leading cause of death and disability worldwide. With inflammation being the root cause in the pathogenesis of atherosclerosis and genetic traits a major risk factor of Ischemic heart disease, studies are now addressing the variation in the genetics of inflammatory system and their influence on the risk of disease. This is carried out with anticipation to identify the genetic risk factors for future prevention of acute myocardial infarction (AMI) and coronary artery disease .Thus the major aim of this study is to investigate the effect C-260T variation in CD14 receptor gene on the incidence of AMI in the Egyptian population.

METHODS: The study consisted of 100 AMI patients and 107 control subjects. DNA was first extracted from blood samples using a DNA extraction kit and genotyping was conducted using PCR-RFLP method.

RESULTS: The genotype distribution for CD14 gene was not significantly different between the control subjects(CC; 15.88%,CT; 62.6%, ,TT; 21.5%). and AMI patients (CC; 13%, CT; 61%, TT; 26%). Odds ratio (OR)1; (p = 0.833). The allele frequencies of the C and T alleles were 47.2% and 52.8%, respectively in the control subjects and 43.5% and 56.5%, respectively in the AMI patients (p= 0.4512).

CONCLUSIONS: No significant association was observed between the C-260 T polymorphism of the CD14 gene and the incidence of AMI in the Egyptian population.

Cardiovascular disease

Cod: 0348

PLASMA HOMOCYSTEINE IN PREECLAMPSIA: TUNISIAN EXPERIENCE

G. Narjes[1], H. Rabaa[1], C. Henda [1], E.g. Emna[1], F. Salima[1], M. Abdelhedi[1]
[1]*Biochemistry Laboratory, Hospital Farhat Hached Sousse, Tunisie*

BACKGROUND: Preeclampsia is a major cause of maternal and perinatal morbidity and mortality. Several risk factors are involved in the physiopathology of Preeclampsia such as maternal age, diabetes, obesity, tobacco. This maternal disorder was associated with an increased risk of atherosclerosis and cardiovascular disease. The aim of this study was to evaluate homocysteine level in preeclamptic women.

METHODS: Our study had focused on 70 pregnant women: 40 women with preeclampsia (mean age 31.16±5.86 years) and 30 healthy pregnancies (mean age 28±4.34 years). Plasma homocysteine was measured by fluorescence polarization immunoassay (Axsym, Abbot).

RESULTS: this study showed that homocysteine levels were significantly higher in women with preeclampsia than in healthy pregnant women (17.27±6.58 µmol/l vs 11.69±1.1 µmol/l, $p < 10^{-}3$).

CONCLUSIONS: Increased plasma homocysteine in women with preeclampsia would be involved in the pathophysiology of preeclampsia. In addition this hyperhomocysteinemia would expose these women to a high cardiovascular risk. Vitamin B12 and folic acid supplementation would be necessary in pregnant women.

Cardiovascular disease

Cod: 0349

CLINICAL EVALUATION OF HIGH SENSITIVE TROPONIN CHANGES IN SERIAL TESTING

L. Honović[1], J. Vlašić Tanasković[1]
[1]*General Hospital Pula*

BACKGROUND: Cardiac troponin (cTn) is the biomarker of choice for diagnosis as well as prognosis of acute myocardial infarction (AMI) and is included in the current universal definition of AMI. One of the assay modalities recently introduced in clinical practice is high sensitive troponin I (hsTnI). The most important role of hsTnI in diagnosis of AIM belong to his sensitivity, specificity and kinetics wich include at least two measurements of hsTnI. The aim of this study was to determine diagnostic accuracy of hsTnI for the early diagnosis of AMI when compared with current cTnI assay on admission to the emergency departement.

METHODS: Samples from 32 patients with chest pain (11 female and 21 male, median age 68) from emergency laboratory were simultaneously analyzed at least two times (at the time of presentation-0TP, 3 hours after admission-3TP, and 6 hours after admission- 6TP) for cTnI and hsTnI by Abbott Architect assays on Architect i2000 platform (Abbott Laboratories, Abbott Park, Illinois, USA). After verification of hsTnI according protocol E15-A2.The manufacturer decision treshold of 99th percentile (15,6 pg/ml for femle and 34,2 pg/ml for male) was accepted.

RESULTS: The values of both troponins were significantly different at 0TP and 3TP. cTnI was significantly increased at admission in 30,7% , 3 hours after in 73,07% (r=0,9286; p<0,0001; 95% CI=0,8543 to 0,9678) and after 6 hours in 100% of patients (r=0,9516; p<0,0001; 95% CI=0,8936 to 0,9783). The values of hsTnI showed incresed at admission in 45%; 80,7% after 3 hours (r=0,9552; p<0,0001; 95% CI=0,9014 to 0,9800) and after 6 hours in 100% of patients (r=0,9960; p<0,0001; 95% CI=0,9889 to 0,9985). The relative delta change between 0TP and 3TP showed >20% incresement in 66% patients for cTnI and 85% patients for hsTnI.

CONCLUSIONS: Our results showed that the introduction of serial testing of hsTnI assay increased the rate of detection of AMI by 15% and displays an good diagnostic performance for the workup of patients with chest pain at the time of initial presentation.

Cardiovascular disease

Cod: 0350

COMPARISON OF CARDIOVASCULAR RISK DISTRIBUTION DETERMINED ACCORDING TO HIGH SENSITIVITY C-REACTIVE PROTEIN CONCENTRATION AND CALCULATED SHORT-TERM AND LONG-TERM RISK

S. Jovicic[1], S. Ignjatovic[1], M. Dajak[2], R. Kangrga[2], N. Majkic-Singh[1]
[1]*Center for Medical Biochemistry, Clinical Center of Serbia and University of Belgrade, School of Pharmacy, Belgrade, Serbia*
[2]*Center for Medical Biochemistry, Clinical Center of Serbia, Belgrade, Serbia*

BACKGROUND: Risk score algorithms for cardiovascular risk assessment in primary prevention are based on traditional risk factors – age, gender, total and HDL cholesterol, smoking, hypertension, and diabetes. Also, high sensitivity C-reactive protein (hsCRP) strongly and independently predicts cardiovascular complications. The aim of this study was to compare the risk distribution between categories according to hsCRP concentration and the three risk score algorithms: 10-year risk for coronary heart disease (CHD) according to Framingham risk score (FRS), 10-year risk for cardiovascular disease in general – "global CVD risk" using global FRS, and long term (30-year) CVD risk.

METHODS: The examined population were 242 healthy volunteers, 100 men and 142 women, 20–80 years old. Concentration of hsCRP was determined using immunoturbidimetric latex assay (Beckman Coulter, USA). FRS, global FRS, and long-term 30-year risk were calculated using electronic calculators "ATP III Risk Estimator", "CVD Risk Check", and "30-year risk of cardiovascular disease", respectively.

RESULTS: Absolute 10-year risk was determined in all participants and classified into categories of <10%, 10–20%, and >20%. Results of Chi-square test of independence showed that cardiovascular risk distribution among risk classes with hsCRP concentrations <1, 1–3, and >3 mg/L was independent from classification according to FRS ($\chi 2$=7.079, P=0.1318), while risk classifications according to global FRS and hsCRP were not independent ($\chi 2$=13.295, P=0.0099). Also, Chi-square test showed that risk classification based on hsCRP values was not independent from distribution between categories of 30-year risk for both „hard CVD" ($\chi 2$=19.685, P=0.0001) and „full CVD" ($\chi 2$=15.559, P=0.0004). Student t-test showed statistically significant differences between mean values of actual age and heart/vascular age in individual hsCRP concentration categories (P<0.05). Also, one-way ANOVA confirmed statistically significant increase in differences across hsCRP concentration categories (P<0.001).

CONCLUSIONS: The dependence among higher hsCRP concentrations and higher short- and long-term risk for any of the CVD complications, as well as higher long-term risk for severe CVD complications, was demonstrated.

Cardiovascular disease

Cod: 0351

A PATIENT WITH A VERY HIGH CONCENTRATION OF B-TYPE NATRIURETIC PEPTIDE (BNP) AND A NORMAL N-TERMINAL PRO-BNP CONCENTRATION

M.J. Janssen[2], M.H. Velmans[2], W.F. Heesen[1]
[1]*VieCuri Medical Center, Department of Cardiology, Venlo, The Netherlands*
[2]*VieCuri Medical Center, Laboratory of Clinical Chemistry and Haematology, Venlo, The Netherlands*

BACKGROUND: A 61-year-old female presented with non-typical chest pain. Myocardial ischemia was ruled out. Very high levels (>25 ULN) of plasma B-type natriuretic peptide (BNP) were found, although she did not exhibit dyspnoea or other clinical symptoms of heart failure. Echocardiography did not provide an explanation for the elevated BNP concentrations. The serum N-terminal pro-BNP (NT pro-BNP) concentration appeared to be normal and serum S100B analysis excluded brain damage. In follow-up, the chest pain complaints disappeared but BNP remained elevated at the same levels. This led us to doubt the accuracy of these BNP values.

METHODS: Possible interference was investigated with BNP and N-terminal pro-BNP (NT pro-BNP) assays from different manufacturers, various (auto)antibody tests, dilutions, addition of mouse serum and polyethylene glycol (PEG) precipitation.

RESULTS: BNP and NT pro-BNP concentrations were normal when measured using all other (NT pro-)BNP immunoassays. Serial dilutions of sample and addition of mouse serum did not alter the results. Specific (auto)antibody tests were negative. However, PEG precipitation showed the possible presence of a high molecular weight immunoreactive protein.

CONCLUSIONS: We report a false positive BNP result possibly caused by a macro-BNP. This macro-BNP was only immunoreactive in the Abbott Architect BNP immunoassay. Clinicians should be aware of analytical interference when BNP results are constantly elevated in the absence of (non)cardiac causes corresponding to an increased BNP.

Cardiovascular disease

Cod: 0352

PROGNOSTIC IMPLICATIONS OF SIMULTANEOUS BIOMARKER ASSESSMENTS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS – OBSERVATIONS FROM THE SAVOR-TIMI 53 TRIAL

P. Jarolim[1], B.M. Scirica[1], D.L. Bhatt[1], M.A. Cavender[1], A.A. Umez-Eronini[1], K. Im[1], D.A. Morrow[1]
[1]*Brigham and Women's Hospital, Harvard Medical School*

BACKGROUND: Cardiac biomarkers improve risk stratification and therefore offer an attractive strategy for cardiovascular (CV) screening. We evaluated the incremental prognostic value of multiple biomarkers reflecting different pathophysiologic processes in stable outpatients with type 2 diabetes mellitus (T2DM) and established CV disease or cardiac risk factors alone to ascertain the benefit of biomarker screening.

METHODS: High sensitivity troponin T (hsTnT), N-terminal pro-B-type natriuretic peptide (NT-proBNP), and high sensitivity CRP (hsCRP) were measured in 12182 patients in the SAVOR–TIMI 53 trial (Does Saxagliptin Reduce the Risk of Cardiovascular Events When Used Alone or Added to Other Diabetes Medications) and followed for a median of 2 years. hsTnT was categorized according to the 99th percentile (14ng/l).

RESULTS: hsTnT levels greater than the 99th percentile were detected in 25% of patients with risk factors only and in 44% of patients with established CVD. Overall, elevated hsTnT was associated with an increasing adjusted hazard ratios (HRadj) for CVD (HRadj 3.6, p<0.01) and myocardial infarction (MI) (HRadj 2.3, p<0.01), with similar results in each risk stratum. There was a stepwise increase in the rates of CV death and MI with higher quartiles of each biomarker. After adjusting for clinical risk factors and biomarkers, elevated concentrations of NT-proBNP and hsTnT remained significantly associated with both CV death and MI, even at lower level elevations. Kaplan-Meier CV death rates at 2 years in Q1, 2, 3, and 4 were 0.5%, 1.2%, 4.8%, and 9.2% for NT-proBNP, 0.6%, 1.6%, 3.2% and 7.7% for hsTnT, and 2.3%, 2.8%, 3.4%, and 4.5% for hsCRP. Corresponding HRadj for quartiles 2, 3, and 4 were 2.08, 3.43, and 9.13 for NT-proBNP, 2.13, 2.79, and 4.92 for hsTnT, and 1.08, 1.34, and 1.63 for hsCRP with a statistically significant trend for each biomarker. Similar results were seen for hospitalization for heart failure and MI.

CONCLUSIONS: In this study of over 12000 patients with T2DM, regardless of baseline risk, a substantial proportion of stable patients with T2DM have evidence of structural heart disease or hemodynamic stress, which were strongly associated with subsequent risk of CV death and MI.

Cardiovascular disease

Cod: 0353

INDICES OF INFLAMMATION ARE CORRELATED WITH RED CELL DISTRIBUTION WIDTH IN HEART FAILURE WITH LEFT VENTRICULAR SYSTOLIC DYSFUNCTION

J. Kaczmarek[1], I. Bujakiewicz[1], A. Milewska[2], D. Karbowy[2], J. Tarchalski[2], M. Biczysko[2], A. Palasz[2], M. Jastrzebska[2], K. Borecka[2], T. Krauze[2], P. Guzik[2]

[1]*Central Laboratory, Heliodor Swiecicki University Hospital, Poznan University of Medical Sciences*

[2]*Department of Cardiology - Intensive Therapy Poznan University of Medical Sciences*

BACKGROUND: The increased red cell distribution width (RDW) is associated with higher risk of mortality in patients with heart failure (HF). There are speculations about the potential mechanisms linking increased RDW with adverse clinical outcomes of HF. One of plausible causes which might be responsible for the RDW – HF association is inflammation. This study aimed at the analysis of the correlation between RDW and biochemical indices of inflammation in HF patients and reduced left ventricular ejection fraction (LVEF) < 50%.

METHODS: Venous blood samples were collected from 299 consecutive ambulatory patients (47 women) with HF and LVEF <50%. The coefficient of variation of RDW (RDW-CV), WBC and five part differentials for the number of neutrophils (PMN), eosinophils (Eo), basophils (Bas), lymphocytes (Ly) and monocytes (Mo) were measured by Sysmex XT 2000i. Additionally, the concentration of CRP was measured by COBAS 6000, Roche and the rate of PMN to Ly was calculated (PMN/Ly). The correlation between RDW-CV and indices of inflammation was analysed by Spearman test. Values of continues data are shown as mean +/-SD.

RESULTS: The mean patients' age was 63.8+/-9.8 years, LVEF 30.6+/-9.5% and RDW-CV 14.2+/-1.6%. The number of inflammatory cells (all in G/L) was as follows WBC 7.7+/-2.3, PMN 4.7+/-1.8, Eo 0.21+/-0.14, Bas 0.031+/-0.02, Ly 2.0+/-0.8 and Mo 0.74+/-0.23. The value of PMN/Ly was 2.5+/-1.2 and CRP was 4.2+/-7.7 mg/L. There was a significant positive correlation between RDW-CV and WBC (rho=0.18; p=0.0014), PMN (rho=0.21; p=0.0003), Mo (rho=0.24; p<0.0001), PMN/Ly (rho=0.23; p<0.0001) and CRP (rho=0.3; p<0.0001).

CONCLUSIONS: In patients with systolic HF, the value of RDW-CV is significantly associated with inflammatory indices such as CRP, the number of WBC, neutrophils and monocytes, and the PMN/LY. The presence of chronic inflammation in HF patients might contribute to the increased RDW-CV. It is also possible that both an impaired growth of red and white blood cell lines as well as the increased synthesis of CRP are caused by other factors directly related to the poor tissue perfusion in HF patients with LVEF <50%. The understanding of the exact mechanisms behind the relationship between RDW-CV and inflammation in systolic HF needs further studies.

Cardiovascular disease

Cod: 0354

ASSOCATION OF ADIPONECTIN AND INDUCIBLE ISCHEMIA BY TREADMILL TEST

M. Sarı[1], K. Ayşem [2]
[1]*Haseki Eğitim Araştırma Hastanesi*
[2]*İÜ Kardiyoloji Enstitüsü Biyokimya Laboratuvarı*

BACKGROUND: Adiponectin is an anti-inflammatory cytokine produced by adipose tissue. We sought to determine whether higher adiponectin levels are associated with exercise-induced ischemia in patients with stable coronary heart disease (CHD).

METHODS: We measured serum adiponectin levels and evaluated exercise-induced ischemia by treadmill test in a cross-sectional study of 94 outpatients with documented stable CHD.

RESULTS: Adiponectin levels correlated negatively with patient age and trigliseride levels and positively with high-density lipoprotein cholesterol levels (all $P < 0.005$). Elevated adiponectin concentrations were also associated with a greater risk of inducible ischemia (p:0.02).

CONCLUSIONS: Higher adiponectin concentrations were also associated with a higher prevalence of exercise-induced ischemia. Perhaps that, in individuals free of heart disease, adiponectin may be modestly protective against developing CHD, while in people already affected with heart disease, it appears to be a marker of harm.

Cardiovascular disease

Cod: 0355

OXIDATIVE STRESS AND INFLAMMATION IN CORONARY ARTERY DISEASE IN TUNISIAN EXPERIENCE

S. Khelil[1], M. Ben Hadj Mohamed[1], M. Ben Dbibis[1], L. Jarrar[2], S. Ernez[2], J. Gwider[2], S. Ferchichi[1], A. Miled[1]
[1]*Biochemistry Laboratory, CHU Farhat Hached Sousse, Tunisia*
[2]*Cardiology Service, CHU Farhat Hached Sousse, Tunisia*

BACKGROUND: Coronary Artery Disease (CAD) is the major cause of morbi-mortality in the most countries. The oxidative stress and inflammation are cooperative events involved in atherosclerosis development. In the present study, we evaluate the association of the prooxydant/antioxidant markers including thiobarbituric acid reactive substances (TBARS), superoxide dismutase (SOD), total antioxidant stat (SAT) and the inflammation index:high sensitive-C reactive protein (hs-CRP) in the patients with coronary artery disease (CAD).

METHODS: Our study was concerned 187 CAD patients with a mean age of 65±11 years followed in the cardiology department of the CHU Farhat Hached-Sousse and 145 subjects as a control group with a mean age of 45±10 years. Lipid peroxidation was estimated by measurement of TBARS in serum by the fluorimetric method previously described by YAGI. The SAT and the activity of SOD were measured using colorimetric method (Kits RANDOX). Hs-CRP was measured by Immuno turbidometry by commercial Kit (Roche).

RESULTS: Serum TBARS levels were significantly higher in the patients when compared to the control group (TBARS: 1,73±1,02 vs 0,81±0,31 µmol/l, p<10-3). The mean value of SAT and the activity of SOD in the patients group were meaningfully lower than those of the control group (SOD: 1406,6±590,66 vs 816,97±525,43 U/g Hb, p<10-3 ; SAT: 1,93±0,15 vs 1,22±0,15 mmol/l, p<10-3). Hs-CRP was also measured in the patient group and comparing with control group significant elevation was noticed (hs-CRP: 21,0248±9,07754 vs 1,5463±1,20842 mg/d).

CONCLUSIONS: Our results showed highly significant relation between oxidative stress, inflammation and CAD.
Indeed CAD patients have increased oxidative stress and a compromised antioxidant defense system. This maladjustment is a consequence of increasing level inflammation, one of the mechanisms by which inflammation causes atherogenesis.

Cardiovascular disease

Cod: 0356

INVESTIGATION OF THE PRESENCE AND SEVERITY OF CORONARY HEART DISEASE BY THE 1H NMR-BASED LIPID PROFILING OF PLASMA LIPOPROTEINS

C. Kostara[2], J. Baltogiannis [1], I. Kastani [2], A. Mitsion [2], V. Tsimihodimos [1], M. Elisaf [1], J. Goudevenos [1], E. Bairaktari [2]
[1]*Department of Internal Medicine, Medical School, University of Ioannina, 451 10, Ioannina, Greece*
[2]*Laboratory of Clinical Chemistry, Medical School, University of Ioannina, 451 10, Ioannina, Greece*

BACKGROUND: Disturbances in the metabolism of plasma lipoproteins have been considered as risk factor for coronary heart disease (CHD). We investigated the ability of the NMR-based lipid profiling of atherogenic (non-HDL) and atheroprotective (HDL) lipoproteins to detect the presence and severity of CHD.

METHODS: Serum samples from 60 patients with CHD [20 with one (mild), 20 with two (moderate) and 20 with triple (severe) vessel disease], and 35 patients with normal coronary arteries (NCA), all angiographically determined, were collected after an overnight fast. Lipid content of lipoproteins was extracted according to a standard procedure. Pattern recognition analysis was applied on the 1H-NMR lipidomic data recorded on a Bruker DRX-500 Spectrometer.

RESULTS: The lipidomic analysis showed that CHD patients at any disease stage presented different lipid profiles of atherogenic and atheroprotective lipoproteins from those recorded from NCA patients. The alterations occurring in lipid profiling of atherogenic lipoproteins were able to distinguish gradually patients with mild, moderate, and severe disease from those with NCA, whereas in atheroprotective lipoproteins profiling was significantly altered only in patients with severe CHD. The lipid components of lipoproteins that characterized the initial stages of disease were the high levels of saturated fatty acids in both HDL and non-HDL lipoproteins, the low levels of HDL-sphingomyelin and HDL-phosphatidylcholine, and omega-3 and linoleic fatty acids in non-HDL. Moreover, the low levels of HDL-cholesterol and the high levels of non-HDL-cholesterol contributed to the onset of disease but to a lesser extent. Finally, a trend for separation among CHD subgroups was observed that was statistically significant in non-HDL models.

CONCLUSIONS: 1H-NMR-based lipidomic analysis of lipoproteins could contribute to the identification of lipid biomarkers for the early evaluation of the onset of CHD and establishment an appropriate therapeutic option.
This research project has been co-financed by the European Union (European Regional Development Fund- ERDF) and Greek national funds through the Operational Program "THESSALY- MAINLAND GREECE AND EPIRUS-2007-2013" of the National Strategic Reference Framework (NSRF 2007-2013)

Cardiovascular disease

Cod: 0357

EUROPEAN MULTICENTER ANALYTICAL EVALUATION OF THE ARCHITECT STAT HIGH SENSITIVE TROPONIN-I IMMUNOASSAY

M. Krintus[8], M. Kozinski[5], P. Boudry[3], N. Estan Capell[7], U. Köller[10], K. Lackner[11], G. Lefèvre[4], L. Lennartz[2], J. Lotz[11], A. Mora Herranz[7], M. Nybo[6], M. Plebani[9], M.B. Sandberg[6], W. Schratzberger[10], J. Shih[1], Ø. Skadberg[12], A. Taoufik Chargui[4], M. Zaninotto[9], G. Sypniewska[8]

[1]*Abbott Laboratories, Abbott Park, IL, US*
[2]*Abbott Laboratories, Wiesbaden, Germany*
[3]*Department of Clinical Biology, CHR Mons-Hainaut, Mons, Belgium*
[4]*Department of Biochemistry and Hormonology, Hôpital Tenon, Paris, France*
[5]*Department of Cardiology and Internal Medicine, Nicolaus Copernicus University, Collegium Medicum in Bydgoszcz, Poland*
[6]*Department of Clinical Biochemistry and Pharmacology, Odense University Hospital, Odense, Denmark*
[7]*Department of Clinical Biochemistry, Dr. Peset University Hospital, Valencia, Spain*
[8]*Department of Laboratory Medicine, Nicolaus Copernicus University, Collegium Medicum in Bydgoszcz, Poland*
[9]*Department of Laboratory Medicine, University Hospital, Padova, Italy*
[10]*Institute for Laboratory Diagnostics, Vienna Hospital Association, Hospital Hietzing, Vienna, Austria*
[11]*Laboratory Medicine, University Medical Center, Johannes Gutenberg University Mainz, Mainz, Germany*
[12]*Laboratory of Clinical Biochemistry, Stavanger University Hospital, Stavanger, Norway*

BACKGROUND: International recommendations highlight the superior value of cardiac troponins for early diagnosis of myocardial infarction along with analytical requirements of improved precision and detectability. In this multicenter study we investigated the analytical performance of a new high-sensitivity cardiac troponin I (hs-cTnI) assay and its 99th percentile upper reference limit (URL).

METHODS: Laboratories in nine European countries evaluated the ARCHITECT STAT high-sensitive Troponin-I immunoassay on the ARCHITECT i2000SR/i1000SR immunoanalyzers. Imprecision, detection limits, linearity of dilution, interferences, sample type, method comparisons, and 99th percentile URLs were evaluated in this study.

RESULTS: Total imprecision of 3.3-8.9%, 2.0-3.5% and 1.5-5.2% was determined for the low, medium and high controls, respectively. The limit of blank (LoB), limit of detection (LoD) and limit of quantitation (LoQ) ranged between 0.1-1.4, 0.5-2.1 and 4.6-8.5 ng/L, respectively. The lowest cTnI concentration corresponding to a total CV of 10% was 5.6 ng/L. Common interferences, sample dilution and carryover did not affect the hs-cTnI results. Slight, but statistically significant, differences with sample type were found. Concordance between the investigated hs-cTnI assay and contemporary cTnI assay at 99th percentile cut-off was found to be 95%. Troponin was detectable in between 52.1 and 87.8% of the apparently healthy population depending on the LoD value used. The 99th percentile values were age and gender dependent.

CONCLUSIONS: The new ARCHITECT hs-cTnI assay with improved analytical features meets the criteria of high sensitivity troponin test and will be a valuable diagnostic tool.

Cardiovascular disease

Cod: 0358

THE RELATIONSHIP BETWEEN HOMOCYSTEINE AND NUMBER OF VESSEL CORONARY DISEASE AND SEVERITY OF CORONARY ARTERY STENOSIS

M. Krstevska[1]

[1]*Department of Medical and Experimental Biochemistry, Medical School, University "Ss. Cyril and Methodius", Skopje, Macedonia*

BACKGROUND: Epidemiological studies and clinical trials have shown that moderately high levels of plasma homocysteine are associated with extend coronary artery disease (CAD), although this association remains controversial.
The aim of the study was to establish if there is correlation between total plasma homocysteine (tHcy) levels and number and severity of coronary artery stenos and to determine correlation with lipids parameters, also.

METHODS: Total number od 165 patients were examined which were divided into 3 groups based on 10 years risk for CAD established according ATP III and Framingham criteria: high risk group consist 60 patients with CAD risk above 20%; group of 49 patients with angiographycally proven CAD and 56 patients, control group, with CAD risk less than 10%. All patients were evaluated for the following risk factors and markers: sex, age, smoking status, hypertension, family history of CAD, lipids, lipoproteins, glucose, white blood cells, urea and creatine.

RESULTS: Mean plasma tHcy levels in high risk group were 16.0 μmole/L, in the group with CAD, 15.3 μmol/L respectively vs. control (13.0 μmol/L). There was correlation between tHcy and total CAD risk and white blood cells count in high risk group. In the group with CAD, tHcy (17,8±8,7 μmol/L) correlated with the frequency of high grade of coronary artery stenosis, (>95%) of arterial lumen.

CONCLUSIONS: We concluded that elevated tHcy correlated with the total CAD risk and the stage of coronary artery disease.

Cardiovascular disease

Cod: 0359

"NORMAL' HS-CTNT LEVEL IN RELATION TO AGE AND SEX IN PATIENTS ADMITTED TO EMERGENCY DEPARTMENT (ED)

S. Krystyna[1], A. Marek[2], G. Bartłomiej [2], Ż. Krzysztof[2]
[1]*Clinical Biochemistry Department, P-A Pediatric Institute, Jagiellonian Institute Collegium Medicum, Krakow, Poland*
[2]*Institute of Cardiology, Jagiellonian University Collegium Medicum, Krakow, Poland*

BACKGROUND: Measurement of hs-cTnT is used in the diagnosis and risk assessment of patients admitted to ED in order to rule-in or rule-out of acute myocardial infaction (AMI). Controversy exists concerning the cut-off point for hs-cTnT in unselected ED patients and how patients with troponin level between 3-14 ng/L should be clinically classified. The aim of the study was to evaluate hs-cTnT level in normal range in relation to age, sex, and clinical outcome after one year of follow-up.

METHODS: Serum hs-cTnT levels (Roche) from 711 consecutive patients (388/323 M/F, age 18-89 years) presenting to the ED due to acute chest pain and discharged as having no AMI or other cardiac problems has been analyzed in relation to age, sex, and clinical outcome after one year of follow-up. Statistical analysis for patients with hs-cTnT level <9 ng/L and >9-14 ng/L has been performed in patients <65 and > 65 years of age. Clinical characteristics after one year of follow-up was adressed to hs-cTnT level during admission.

RESULTS: Significant correlation between hs-cTnT level and patient age was noted (p<0.001). Such relation was valid also for patients <65 years of age (p<0.001) but not for patients >65 years of age. In women and men >65 years of age hs-cTnT levels >9-14 ng/L were more frequently measured as compared to women and men <65 years of age, however the odds ratio was much higher for women than for men (women: OR 13.52. 95%CI 4.05-45.17. men OR 5.05; 95%CI 2.88-8.87). Regardless the age, cardiac ambulatory care during one year of follow-up was more frequently necessary for patients with hs-cTnT level >9-14 ng/ml as compared to patients with hs-cTnT level less than 9 ng/L (OR 2.43; 95%CI 1.50-3.91). Based on analysis performed in patients below and above 65 years of age with hs-cTnT level >9-14 ng/L, younger patients (<65 years of age) required ambulatory cardiac care more frequently (OR 3.13; 95%CI 1.29-7.61) as compared to patients with hs-cTnT level <9 ng/L.

CONCLUSIONS: Separate cut-offs for hs-cTnT level are necessary for patients younger than 65 years of age, especially for women (sex- and age-specific 99th percentile values). Clinical end points characteristics after one year of follow-up are not related to hs-cTnT if the level is in "normal" range.

Cardiovascular disease

Cod: 0360

RAPID SCREENING OF FAMILIAL HYPERCHOLESTEROLEMIA BY SIMULTANEOUS DETECTION OF MUTATIONS USING A BIOCHIP ARRAY PLATFORM

R. Martin[1], P. Hart[1], M. Latten[2], H. Murray[2], M. Crockard[2], J. Lamont[2], S. FitzGerald[2], C. Graham[1]
[1]*Northern Ireland Regional Genetics Centre, Belfast Health and Social Care Trust/City Hospital, United Kingdom*
[2]*Randox Laboratories Limited, Crumlin, United Kingdom*

BACKGROUND: Familial Hypercholesterolemia (FH) is a genetic disorder characterised by high levels of low density lipoprotein in the cardiovascular system and early onset of cardiovascular disease. FH is most commonly caused by mutations in apo-lipoprotein B (ApoB), low density lipoprotein receptor (LDLR), and proprotein convertase subtilisin/kexin type 9 (PCSK9) genes. FH can be treated quite effectively with lipid-lowering drugs and lifestyle changes. Genetic testing and cascade screening have been recommended by the National Institute for Health and Clinical Excellence (2008). This study reports an assay, based on a combination of multiplex PCR and biochip array hybridisation, which enables the rapid simultaneous detection of 40 mutational targets within ApoB, LDLR and PCSK9. This represents a cost-effective approach and rapid turnaround time, with easy to interpret results using the system software.

METHODS: The assay is based on a combination of multiplex PCR reactions and biochip array hybridisation. Innovative PCR priming permits high discrimination between multiple wild-type and mutant DNA regions which hybridise to complementary test regions on the biochip array. DNA extracted from peripheral blood and buccal cells were assayed. Using the biochip array analyser Evidence Investigator system, results are processed automatically, with analysis completed within 3 hours, from template DNA.

RESULTS: Verification of the assay was achieved using 159 pre-characterised DNA samples in order to confirm specificity of the biochip array for detecting the FH mutations. Furthermore, validation of the array was completed using an additional set of 100 pre-characterised samples. This was completed in a blinded study showing 98% concordance. The assay detected 71% of all the point mutations in FH patients within the United Kingdom (based on 465 families from a variety of ethnic backgrounds with identified FH mutations).

CONCLUSIONS: This rapid screening technique enables the simultaneous analysis of 40 common mutations associated with FH. This will aid in the confirmation of suspected cases of FH and in cascade screening of FH cases, hence reducing FH associated morbidity and mortality.

Cardiovascular disease

Cod: 0361

ASSOCIATION OF HEMOGLOBIN LEVELS WITH BLOOD PRESSURE AND HYPERTENSION IN A LARGE POPULATION-BASED STUDY: THE KOREA NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY 2008–2011

S. Lee[1], J.H. Rim[1], J. Kim[1]
[1]*Department of Laboratory Medicine, Yonsei University College of Medicine, Seoul, Korea*

BACKGROUND: We investigated the association of hemoglobin (Hb) levels with blood pressure (BP) and hypertension in both normal and anemic range of Hb levels, after adjusting for other hypertension risk factors.

METHODS: The study population consisted of a total of 20,076 subjects (i.e., 8,721 men, 11,355 women) aged ≥20 years who participated in the Korea National Health and Nutrition Examination Surveys conducted between 2008 and 2011. Whole blood Hb levels and BP were measured along with other hypertension risk factors.

RESULTS: Multivariate linear regression analysis showed the systolic BP (SBP) and diastolic BP (DBP) increased by 2.6 mmHg (95% CI, 2.1–3.1 mmHg) and 3.2 mmHg (95% CI, 2.8–3.6 mmHg) with 1 mmol/L increase in the Hb level, respectively, after adjusting for age, body mass index (BMI), total cholesterol, alcohol drinking, current smoking, mild renal dysfunction, and diabetes mellitus (DM) in men with Hb levels of ≥8.1 mmol/L (13.0 g/dL). Similarly, in women with Hb levels of ≥6.8 mmol/L (11.0 g/dL), the SBP and DBP increased by 2.6 mmHg (95% CI, 2.1–3.0 mmHg) and 3.2 mmHg (95% CI, 2.8–3.5 mmHg) with every 1 mmol/L increase in the Hb level, respectively. However, this positive association between Hb level and BP disappeared at low Hb levels (men, <8.1 mmol/L [13.0 g/dL] and women, <6.8 mmol/L [11.0 g/dL]).

CONCLUSIONS: Hb level was positively associated with SBP and DBP in men with Hb levels ≥8.1 mmol/L (13.0 g/dL) and women with Hb levels ≥6.8 mmol/L (11.0 g/dL) in the general Korean population. However, this positive association disappeared at anemic Hb levels.

Cardiovascular disease

Cod: 0362

AN ENZYMATIC LP-PLA2 ASSAY FOR FULLY AUTOMATED ANALYSIS: A VALUABLE SUPPLEMENTATION TO CURRENTLY USED CARDIOVASCULAR RISK ASSESSMENT

A. Lein[1], I. Delseith[1], T. Hektor[1], M.M. Hoffmann[2], K. Winkler[2], M. Grimmler[1]
[1]*DiaSys Diagnostic Systems GmbH, Germany*
[2]*University Medical Center Freiburg, Germany*

BACKGROUND: Lipoprotein-associated phospholipase A2 (Lp-PLA2) is a Ca2+-independent serine lipase. The enzyme is produced by macrophages and is mainly expressed in atherosclerotic lesions. Lp-PLA2 is primarily associated with low-density lipoprotein (LDL) and responsible for the hydrolysis of oxidized phospholipids, resulting in the production of pro-inflammatory and pro-atherogenic mediators. Lp-PLA2 is a useful plasma biomarker associated with cardiovascular disease and enables the identification of vulnerable plaques. Here we present a fully automated liquid-stable, ready-to-use reagent for determining the activity of Lp-PLA2. Enzyme activity in sample material is determined after hydrolysis of a Lp-PLA2 specific substrate. Resulting product can be quantified at 415 nm.

METHODS: Assay adaption and performance verification have been carried out on Hitachi 917. All reagents, calibrators and controls were from DiaSys Diagnostic Systems GmbH. Performance data were determined for 3 different sample materials (serum, EDTA and-heparin plasma). Analytical performance was established according to the CLSI protocol. Method comparisons were performed against competitor test on Hitachi 917. Data have been evaluated by using regression analysis according to Passing and Bablok.

RESULTS: A method comparison of Lp-PLA2 FS against a competitor test with 97 native samples demonstrated excellent correlation [r = 0,999; Passing/Bablok: y = 0,909 x – 4.28 U/L]. Lp-PLA2 shows outstanding intra-assay precision with a CV of <0.72%. Common endogenous interferents like bilirubin, hemolysis and lipemia showed no significant interference.

CONCLUSIONS: DiaSys Lp-PLA2 FS assay shows outstanding performance characteristics for recommended sample material. The test correlates well to available assays in the market. The new DiaSys Lp-PLA2 FS reagent provides rapid, accurate and convenient measuring of Lp-PLA2 in human samples on any clinical chemistry analyzer. Determination of Lp-PLA2 allows a more precise assessment of cardiovascular risks.

Cardiovascular disease

Cod: 0363

THE IMPORTANCE OF CARDIAC MARKERS FOR THE STRATIFICATION AND MONITORING OF AL AMYLOIDOSIS PATIENTS

P. Lochman[1], T. Pika[1]
[1]*Faculty Hospital Olomouc, Czech Republic*

BACKGROUND: Cardiac involvement is a dominant prognostic factor in AL amyloidosis patients. A detailed assessment of the presence and degree of cardiac involvement utilizes an array of noninvasive investigation methods, particularly echocardiography and MRI as well as laboratory parameters including troponins and natriuretic peptides. Cardiac biomarkers are used as a relatively strong stratification and prognostic factor. We present cardiac markers applications in AL amyloidosis patients at an specialized treatment center.

METHODS: The monitored patient set included 22 patients with histologically confirmed AL amyloidosis, of whom 18 met the criteria for cardiac involvement. Levels of cardiac markers troponin T (TnT) and N-terminal pro-brain natriuretic peptide (NT-ProBNP) were determined in all patients. Risk stratification of the patients utilized the Mayo staging system which is based on both biomarkers assays. Log Rank Test was applied to survival evaluation.

RESULTS: Median survival of patients with cardiac involvement was 10 months vs 60 months survival of patients without signs of cardiac involvement (p = 0.133). 1 of the 4 patients without cardiac involvement has shown positive levels of TnT and 2 positive levels of NT- ProBNP. All cardiac involvement patients exhibited abnormal levels of NT-ProBNP (median 4,752 ng/l) as well as positive levels of TnT (median 0.0815 μg/l; 0.02– 0.986). The application of the Mayo stratification system to the set had determined 2 patients at stage I, 5 patients at stage II and 15 patients at stage III. The median survival of the Mayo I + II group vs the Mayo III group was 60 vs 6 months (p = 0.015), revealing extremely limited survival of stage III patients. Assessment of relation the TnT and NT-ProBNP levels to treatment response shows that decrease in both markers depends on maximum treatment response – respectively the attainment of a complete hematological remission.

CONCLUSIONS: The results confirm a definitive benefit of the application of cardiac biomarkers assay in the diagnostic and therapeutic algorithm of AL amyloidosis patients. The Mayo stratification system utilizing the cardiac indicator values represents a robust tool for risk stratification of AL amyloidosis patients.

Cardiovascular disease

Cod: 0364

ASSOCIATION OF HIGH SENSITIVE CARDIAC TROPONIN I LEVELS WITH ADVERSE CARDIAC OUTCOMES IN CHRONIC HEART FAILURE PATIENTS

O. Lysikov[2], A. Bugrov[2], I. Maximova[1], V. Dolgov[2], A. Roytman[2]
[1]*I.M.Sechenov First Moscow State Medical University*
[2]*Russian Medical Academy of Postgraduate Education*

BACKGROUND: Worldwide studies demonstrated that levels of several biomarkers of myocardial injury-high sensitive cardiac troponin (hscTn I), of myocardial dysfunction - brain natriuretic peptide (NT-proBNP) and of vascular inflammation are important tools for risk assessment of adverse cardiac outcomes in different cardiovascular diseases. AIM.To evaluate the prognostic significance of hscTnI for the risk assessment of adverse cardiac outcomes in chronic heart failure (CFH) patients (pts).

METHODS: The serum samples of 70 II and III NYHA classes CHF pts (age 45-90 years) were analyzed on admission and on 6 months after discharge. The control group: 95 healthy donors (age 22-70 years).The serum hscTnI levels was measured by chemiluminescent enzyme immunoassay (CLEIA) - PATHFAST (Mitsubishi Chemical Medience Corporation, Japan).According the clinical outcomes all CHF pts were divided in 2 groups: 1st group: 39 patients of II and III NYHA classes with clinical improvement of the disease (Positive prognosis group–PG); 2nd group: 31 pts of III NYHA class with the worsening of the disease or cardiovascular death within 6 months)(Negative prognosis group –NG).

RESULTS: The mean levels hscTnI on admission in PG and NG pts, were 9.1 pg/ml and 28.1 pg/ml respectively and were significantly higher ($p<0.05$:$p<0.001$) than mean level-6.0 pg/ml in control group. At 6 months after discharge the mean levels of hscTnI in PG and NG were 8.0 pg/ml and 20.1 pg/ml respectively and were significantly higher ($p<0.05$:$p<0.001$) than the mean level - 6.0 pg/ml in control group. In PG patients the admission hscTnI level-9.0 pg/ml were significantly higher ($p<0.01$) than hscTnI level at 6 months after discharge-8.0 pg/ml. The ROC analysis revealed 76% sensitivity and 71% specificity of hscTnI cut-off level 6.0 pg/ml for the predicting of CHF worsening, unfavourable clinical prognosis and cardiac death during 6 months AUC=0,853,[95% CI 79 ; 91]$p<0,001$. In CHF pts hs cTnI levels>6.0 pg/ml were associated with 5-fold increased risk of adverse cardiac outcomes and cardiac death RR-4.98,[95%CI 2,5;10,1] $p<0.01$).

CONCLUSIONS: The results demonstrated that in CHF patients hscTnI may be used as the efficient biomarker of myocardial injury associated with high risk of the disease worsening and cardiovascular death.

Cardiovascular disease

Cod: 0365

ASSOCIATION OF METABOLIC SYNDROME WITH SEVERITY OF CORONARY ARTERY DISEASE

N. Mahalle[3], M. Garg[2], S. Naik[3], M. Kulkarni[1]
[1]*Biochemistry Division, Chemistry Department, University of Pune, Pune-411001*
[2]*Department of Endocrinology, Command Hospital (Southern Command), Pune – 411040*
[3]*Department of Pathology, Biochemistry Section, Deenanath Mangeshkar Hospital, Pune- 411004*

BACKGROUND: South Asians are more prone to develop metabolic syndrome (MetS). The additive predictive value of MetS for cardiovascular diseases is still debated. We undertook this study to evaluate the association of MetS and its components with severity of coronary artery disease (CAD).

METHODS: Three hundred patients with known coronary disease above the age of 25 years were included in this study. Blood samples were collected for biochemical markers. Patients were stratified into subjects with and without MetS (IDF criteria) and severity of CAD (number of vessel involved).

RESULTS: Mean age of the patient in the study was 60.9±12.4 years, 72% were males and 28% were females. MetS was present in 64% patients. Patients with MetS had more severe CAD compared to those without MetS (Triple vessel disease: 62.5% vs 34.3%,p<0.0001; Double vessel disease: 22.9% vs 29.6%,p:0.2522; and Single vessel disease: 14.6% vs 36.1%; p <0.0001). The percent number of patients with TVD showed increasing trend with increasing number of components of MetS (0-0%; 1-20%; 2-27.5%; 3-47.8%; 4-72.6%; 5-78.3%; chi square for trend <0.0001). Inflammatory markers [IL6: 77.67±79.48 vs 41.21±60.72 pg/ml, p<0.0001; TNF-α: 28.0±47.49 vs 20.43±24.5 pg/ml, p<0.0001; hsCRP: 14.30±9.91 vs 7.02±7.18 mg/L, p<0.0001], and Insulin resistance [HOMA-IR: 22.33±23.37 vs 10.86±13.90, p<0.0001] were higher and insulin sensitivity [QUICKI: 0.26±0.03 vs 0.30±0.04, p<0.0001] was significantly lower in subjects with MetS compared to subjects without MetS. Among lipids, total cholesterol (175±42 vs 179±48 vs 180±47 mg/dl, p=0.72) and LDL (101±15 vs 108±53 vs 106±52 mg/dl, p=0.67) were comparable but triglyceride (175±42 vs 179±48 vs 180±47 mg/dl, p<0.0001), was high and HDL (44.72±7.63 vs 39.96±8.70 vs 36.05±8.84, p<0.0001) was low in subjects with TVD compared to SVD and DVD. Similarly, percentage of patients with diabetes (7.5% vs 26.3% vs 63.7%, p<0.0001) and hypertension (34.3% vs 56.6% vs 77.7%, p<0.0001) were higher in subjects with TVD compared to SVD or DVD.

CONCLUSIONS: There is a strong correlation of MetS and its components with severity of CAD. Severity of CAD correlated with presence of coronary risk factors, IR and inflammatory markers.

Cardiovascular disease

Cod: 0366

FIBRONECTIN IS OVER-EXPRESSED IN ATHEROSCLEROSIS

E. Manov[2], V. Manolov[1], V. Vasilev[1]
[1]*Medical Diagnostic Laboratory Kandilarov*
[2]*Medical University Sofia, Bulgaria, Department of Cardiology; University Hospital Alexandrovska*

BACKGROUND: Fibronectin is a major component of the extracellular matrix and blood plasma, and is a specific ligand for several integrin adhesion receptors. Fibronectin plays an important role not only in cell adhesion and wound healing, but also in embryogenesis and hematopoiesis. Fibronectin is over-expressed in cardiovascular disease states such as atherosclerosis and myocardial infarction.

METHODS: We studied several patients with atherosclerosis for a period of one year; they were patients from Medical University Hospital "Alexandrovska" in Sofia, Bulgaria. Eighty patients (50 men and 30 women) average age 49.14 ±12.5 (25–87 years) were tested for serum hsCRP, total cholesterol, HDL and LDL cholesterol and fibronectin. Their results were compared to healthy volunteers.

RESULTS: The mean age of women with atherosclerosis was 52.8 ± 10.14 years (35-65 years) compared to 41.7 ± 7.89 years (30 – 54 years) in healthy volunteers (P=0.05). The mean age of men with atherosclerosis was 54.8 ± 14.61 years (30-87 years) compared to 46.2 ± 10.18 years (29-63 years) in healthy volunteers. We found a statistical difference between two groups in serum hsCRP, total cholesterol, HDL and LDL cholesterol. The mean concentrations showed significantly differences in control group vs. atherosclerosis: hsCRP 0.6 ± 0.29 mg/l vs. 17.59 ± 3.28 mg/l (P=0.04); total cholesterol 3.73 ± 0.47 mmol/l vs. 6.94 ± 0.54 mmol/l (P<0.01); HDL 2.66 ± 0.27 mmol/l vs. 0.65 ± 0.21 mmol/l (P<0.01); LDL 1.47 ± 0.24 mmol/l vs. 4.07 ± 0.52 mmol/l (P<0.01). The mean of serum Fibronectin in atherosclerosis was 32.38 ± 6.43 ng/ml vs. 1.49 ± 0.74 ng/ml in healthy control group (P =0.05).

CONCLUSIONS: The results from our study indicates that the mean level of serum Fibronectin is statistically higher cardiovascular disease such as atherosclerosis. The serum Fibronectin levels might be useful in clinical practice for detecting of cardiovascular disease such as atherosclerosis.

Cardiovascular disease

Cod: 0367

LATEX-ENHANCED IMMUNOTURBIDIMETRIC ASSAY FOR THE DETERMINATION OF 11-DEHYDRO THROMBOXANE ß2 IN URINE AS NEW ANALYTICAL TOOL FOR THE STUDY OF ASPIRIN EFFECTIVENESS

G. Shanbhag[1], L. Young[1], P. McGivern[1], P. Lowry[1], M.E. Benchikh[1], S. McElhatton[1], R. McConnell[1], J. Campbell[1], S. FitzGerald[1]

[1]*Randox Laboratories Limited, Crumlin, United Kingdom*

BACKGROUND: Activated and aggregated platelets play a key role in the pathogenesis of cardiovascular disease. An important part of antiplatelet therapy in cardiovascular disease is aspirin, but its effectiveness varies among individuals. Activated platelets produce a potent vasoconstrictor and inducer of platelet aggregation: thromboxane A2(TxA2). The measurement of stable metabolites of TxA2, such as urinary 11-dehydro thromboxane B2(11dhTxB2), allows the determination of the production of TxA2 by platelets and the assessment of the effectiveness of aspirin therapy. This study presents the performance evaluation of a latex-enhanced immunoturbidimetric assay to determine levels of 11dhTxB2 in human urine.

METHODS: The assay is a latex-enhanced immunoturbidimetric assay based on the principle of measuring changes in scattered light as a change in absorbance at 700nm. The latex particles are coated with 11dhTxB2, which in the presence of anti-11dhTxB2 antibody solution, rapidly agglutinate. When a sample containing 11dhTxB2 is introduced, the agglutination reaction is partially inhibited. The change in absorbance is inversely proportional to the concentration of 11dhTxB2 in the sample. The 11dhTxB2 urine values are then required to be normalised using urine creatinine values. The assay is applicable to different analysers, in this analytical evaluation the ADVIA 1650 system was used.

RESULTS: The analytical range of the assay was 0 to 6,000pg/mL (extended linearity range: up to 12000pg/mL) with a limit of blank of 169.69pg/mL. The intra-assay precision, expressed as %CV, was <7% for three different concentration levels. Correlation with AspirinWorks Test kit(11dhTxB2 EIA kit) demonstrated a correlation co-efficient r= 0.985 for 169 unaltered urine samples across the assay range.

CONCLUSIONS: Data shows optimal performance of the reported assay kit for the determination of 11dhTxB2 in urine samples. The assay is applicable to different automated analysers and utilises ready–to-use reagents which ensures the reliability and accuracy of the measurements and facilitates the testing procedure. The assay is of value as a new analytical tool to predict the effect of aspirin treatment in clinical settings.

Cardiovascular disease

Cod: 0368

EFFECT OF FACTOR XIII SUBUNIT B P.HIS95ARG AND INTRON K IVS11+144 (NT29756C>G) POLYMORPHISMS ON THE RISK OF MYOCARDIAL INFARCTION

Z.A. Mezei [1], Z. Bereczky[1], L. Balogh[3], É. Katona[1], E. Balogh[3], I. Czuriga[3], I. Édes[3], L. Muszbek[2]

[1]*Clinical Research Center, University of Debrecen, Clinical Center*

[2]*Clinical Research Center, University of Debrecen, Clinical Center; Hungarian Academy of Sciences, Haemostasis, Thrombosis and Vascular Biology Research Group, Debrecen, Hungary*

[3]*Institute of Cardiology, University of Debrecen, Clinical Center*

BACKGROUND: Cardiovascular disease is the leading cause of death in both women and men. Elevated factor XIII (FXIII) levels is an independent risk factor of the myocardial infarction (MI) in women. The Val34Leu polymorphism located on the A subunit of FXIII (FXIII-A p.Val34Leu) has a protective effect against MI at high fibrinogen concentrations. The effect of FXIII-B subunit polymorphisms, p.His95Arg and IntronK (nt29756C>G), on the risk of cardiovascular diseases has not been investigated.

METHODS: 687 consecutive patients admitted to coronary angiography for investigation of suspected coronary artery disease and 1000 individuals representing the Hungarian population were genotyped for FXIII-B p.His95Arg and Intron K nt29756C>G polymorphisms.

RESULTS: The rare allele frequencies of the His95Arg and IntronK (nt29756C>G) polymorphisms in the population were 0.08 and 0.15, respectively, which are similar to the results for Caucasians available in the HapMap database. The allele frequencies in the clinical controls (without MI and no significant coronary stenosis, n=237) did not differ significantly from the respective values in the general population. Carriers of the IntronK (nt29756C>G) polymorphism had significantly lower FXIII activity (97±21% vs. 106±21%, p<0.001) and $FXIIIA_2B_2$ antigen (21.3±4.7 mg/L vs. 23.8±5.0 mg/L, p<0.001) levels compared to the wild type individuals. In patients with elevated fibrinogen levels, the FXIII-B IntronK (nt29756C>G) polymorphism significantly decreased the risk of MI (OR: 0.37, 95% CI: 0.17-0.84, p=0.017). Double carriership for FXIII-A p.Val34Leu and FXIII-B IntronK (nt29756C>G) polymorphisms conferred an even higher protective effect against MI (OR: 0.08, 95% CI: 0.02-0.39, p=0.003), suggesting an interactive effect between the two polymorphisms.

CONCLUSIONS: Our results suggest that in the stratification for the risk of coronary artery disease, besides measuring fibrinogen concentration and FXIII levels, it might be important to include the determination of certain FXIII gene polymorphisms.

Cardiovascular disease

Cod: 0369

LIPID PROFILE, HOMOCYSTEINE AND CARDIOVASCULAR DISEASE

M. Milošević-Tošić[4], M. Djeric[2], T. Momčilov-Popin[3], I. Divjak[1], D. Pap[6], A. Nikolić[5]
[1]*Clinical Centre of Vojvodina, Clinic of Neurology, Novi Sad, Serbia*
[2]*Clinical Centre of Vojvodina, Laboratory Medicine Centre, Novi Sad, Serbia*
[3]*Institute of Cardiovascular Diseases, Clinic of Cadiology, Novi Sad, Serbia*
[4]*Medical Faculty in Novi Sad, Department of Biochemistry, Novi Sad, Serbia*
[5]*Medical Faculty in Novi Sad, Department of Pharmacy, Novi Sad, Serbia*
[6]*Students Department of Health, Novi Sad, Serbia*

BACKGROUND: Cardiovascular disease (CVD) takes the leading position on the list of diseases of the modern world, showing an increasing tendency and high mortality rates in many countries. Risk factors for cardiovascular disease are well established, though not necessarily present. The aim of these study was to examine associations between lipid profile, as a major risk factor for CVD, and homocysteine concentrations, which is considered one of independent risk factors, in a group of patients with cardiovascular diseases.

METHODS: In this work lipid profile and homocysteine concentrations were measured in group of patients with myocardial infarction (IM), ischemic stroke group and control group. Lipid profile was determined with standard methods. Homocysteine level was determined using the FPIA method on Abbott AxSym Analyzer.

RESULTS: The obtained values of lipid parameters didn't fully reflect the importance of elevated lipid levels as a risk factor, yet we have to emphasize that many of patients were subjected to hypolipemic drug therapy. Furthermore, lower HDL levels and increased triglyceride levels were observed in relation to the control group. Only trigliceride levels showed descriptive caracteristics in relationship to healthy perons and patients with IM (ROC=0,744) and ischemic stroke (ROC=0,660). Higher VLDL leves in IM and in group of patients with ischemic stroke (0,81 and 0,68 respectively) compared to the control group (0,5 mmol/l) were achived. Elevated homocysteine levels were determined in 41,1% of patients with myocardial infarction history. 26,7% of patient with stroke history were hyperhomocysteinemic, whereas only 10% of participants from the control group had homocysteine concentrations above 12 μmol/l. Men with myocardial infarction history had significantly increased homocysteine levels ($p<0,001$), as well as male patients with stroke ($p= 0,05$). Women from both groups were not characterized by significantly higher homocysteine concentrations.

CONCLUSIONS: On the basis of the obtained results we can suggest that determination of homocysteine levels together with lipid profile determination plays an important role in evaluating the risk factors for development of cardiovascular disease.

Cardiovascular disease

Cod: 0370

INFLAMMATORY RESPONSE TO CORONARY STENT IMPLANTATION AND ITS ASSOCIATION WITH RED BLOOD CELL MEMBRANE FATTY ACIDS

V. Muzakova[3], J. Skalicky[2], T. Cermak[3], J. Matejka[1], J. Kovarik[2], P. Lastovicka[3], A. Cegan[3]

[1]*Regional Hospital of Pardubice, Dept. of Cardiology, Pardubice, Czech Republic*

[2]*Regional Hospital of Pardubice, Dept. of Clinical Biochemistry and Diagnostics, Pardubice, Czech Republic*

[3]*University of Pardubice, Faculty of Chemical Technology, Dept. of Biological and Biochemical Sciences, Pardubice, Czech Republic*

BACKGROUND: In coronary heart disease (CHD), treatment of significant stenosis by percutaneous coronary intervention (PCI) with stent implantation elicits local and systemic inflammatory responses. Their intensity and magnitude negatively affect clinical outcome and increase risk of stent restenosis. This study was aimed to description of inflammatory response and elucidation whether red blood cell (RBC) membrane fatty acid profile influences inflammation after PCI.

METHODS: Blood samples of patients with CHD undergoing PCI were analyzed before, 24 and 48 h after stent implantation (n=24). High sensitive C-reactive protein (hsCRP) was determined by standard procedure using analytical system VISTA®; interleukin-6 (IL-6) by an immunochemistry analyzer Immulite® and serum amyloid A (SAA) by laser nephelometer BN ProSpec® (all provided by Siemens Healthcare Diagnostics Inc., USA). RBC membrane fatty acid profiles were measured by GC/FID. Statistical analyses were done with software STATISTICA v. 10.0.

RESULTS: Patients after PCI exhibited significant increase of inflammatory markers. The earliest response, with maximum after 24 h, was observed in case of IL-6 (1.0 ± 2.1 ng/l , 24 h: 7.4 ± 4.7 ng/l , 48 h: 4.4 ± 4.7 ng/l), followed by elevation of hs-CRP (2.6 ± 0.4 mg/l, 24 h: 4.1 ± 0.6 mg/l, 48 h: 5.9 ± 4.4 mg/l) as well as SAA (5.1 ± 1.0 mg/l, 24 h: 6.9 ± 2.1 mg/l, 48 h: 9.0 ± 4.4 mg/l), with maxima after 48 h. Considering RBC membrane fatty acids, statistically significant ($p<0.05$) positive association with hsCRP baseline was found for myristic acid (r=0.65), 14-methylhexadecanoic acid (r=0.54) and trans-palmitoleic acid (r=0.58), inverse association with magnitude of change in CRP was indicated for oleic acid (r=-0.46). In case of SAA, 12-methyltetradecanoic acid (r=0.51) was positively related, as well as arachidic acid (r=0.52), lignoceric (r=0.59) and gama-linolenic acid (r=0.52) were significantly positively correlated with postprocedural increase in IL-6.

CONCLUSIONS: Inflammatory response after PCI includes the rapid increase in IL-6 (maximum after 24 h), while peaks in CRP and SAA culminate after 48 h. Positive correlation with postprocedural increase of inflammatory markers was found for gama-linolenic acid, precursor of proinflammatory n-6 PUFA, and branched-chain and very-long-chain fatty acids.

Cardiovascular disease

Cod: 0371

BIOCHEMICAL MARKERS OF LIPID PROFILE ASSOCIATED WITH CARDIOVASCULAR DISEASES IN RANDOM GROUPS OF MEN AND WOMEN IN EASTERN SLOVAKIA

M. Mydlarova Blascakova[2], L. Blascakova[1], J. Poracova[2], V. Sedlak[2], J. Mydlar[4], E. Petrejcikova[2], J. Bernasovska[2], I. Boronova[2], J. Kotosova[3]

[1]*Pavol Jozef Safarik University in Kosice, Faculty of Science, Department of Biophysics, Jesenna 5, 041 54 Kosice, Slovakia*

[2]*University of Presov, Faculty of Humanities and Natural Sciences, Department of Biology, 1,17th November Street, 081 16 Presov, Slovakia*

[3]*University of Presov, Faculty of Humanities and Natural Sciences, Department of Ecology, 1,17th November Street, 081 16 Presov, Slovakia*

[4]*University of Presov, Faculty of Humanities and Natural Sciences, Department of Geography and Regional Development, 1,17th November Street, 081 16 Presov, Slovakia*

BACKGROUND: Lipid profile consists of a set of tests, which are an indicator for the risk of myocardial infarction, stroke and atherosclerosis, it is used to determine the risk of cardiovascular disease. It consists of a higher level of total cholesterol (CHOL), HDL, LDL, TAG.

METHODS: The experimental sample included 100 individuals (50 males, 50 females), aged 50-85 years. Every individual had their blood pressure measured (systolic/diastolic) by blood pressure monitors OMRONM1Plus. Blood serum was separated from blood samples by centrifugation (R Selecta, Spain), in which selected markers of lipid profile (CHOL, HDL, LDL, TAG) were determined through a fully-automated biochemical analyzer Cobas Integra 400 plus (Switzerland). The measured data was processed by softver Excel 2010 and Statistica ver.10.

RESULTS: The average systolic blood pressure in women was 137.820±18.170 mmHg in men 137.240±13.407 mmHg, which is defined according to the European Society of Hypertension and the European Society of Cardiology (2003) as a normal level of blood pressure. The average value of TAG in women was 1.797±0.746 mmol/L and in men 1.969±0.879 mmol/L. The average concentration of LDL was 3,100±0,907 mmol/L in women, 3.109±0.959 mmol/ L in men. The average concentration of HDL in women was 1.559±0.425 mmol/L. The minimum value of HDL, which we measured in women was 0.570 mmol/L, indicating a high risk of cardiovascular diseases. In men, the measured value of HDL was 1.290±0.429 mmol/L. Using Student's T test, we found statistical significance ($p<0.01$) between a group of men and women regarding HDL. The average measured value of total cholesterol in the entire research group was 5.561±1.350 mmol/L. Through the correlation analysis, we found statistical significance ($p<0.05$) throughout the entire research group between LDL and TAG, HDL and TAG.

CONCLUSIONS: Appropriate preventative treatment of cardiovascular disease is early prevention, it is connected with a healthy lifestyle, maintain reasonable body weight, physical activity and control of biochemical markers in the blood lipid profile. The work was supported by the Agency of Ministry of Education, Science, Research and Sport of the Slovak Republic, the project ITMS: 26110230100.

Cardiovascular disease

Cod: 0372

HOMOCYSTEINE, AN EARLY PREDICTOR OF CARDIOVASCULAR RISK IN TYPE2 DIABETES MELLITUS

N.M. Naseb[2], J.R. Peela[1], S. Shakila[1], A.R. Said[1], L.T. Peela[4], R.N. Yedla[3]
[1]*Department of Biochemistry, Faculty of Medicine, Quest International University Perak, 30250 Ipoh, Malaysia*
[2]*Department of Biochemistry, Faculty of Medicine, University of Bengahzi, Libya*
[3]*Department of Medicine, Andhra Medical College, Visakhapatnam, India*
[4]*Great Eastern Medical School, Srikakulam, India*

BACKGROUND: Homocysteine is an amino acid derivative of S-Adenosyl methionine, which is sulfated to form cysteine. Thus homocysteine has gained importance as an early marker of atherosclerosis leading to vascular diseases. Hence the objective of the current study is to evaluate the association of high plasma homocysteine with atherosclerosis based on a comparative study on patients diagnosed with type 2 diabetes mellitus with and without complications.

METHODS: This study was carried out using the laboratory data of sixty subjects from 30 to 75 years old. The data was collected from the samples sent from the outpatients of Diabetes Clinic, 17th February Hospital, El Baida. The study drawn were categorized into three groups: The control group comprised of twenty age matched healthy volunteers with no history of diabetes mellitus. The second group comprised of diabetics with no history of coronary artery disease and the third category comprising of twenty patients with a long history of type2 diabetes associated with one or more episodes of coronary artery disease. The fasting blood samples were analyzed for glucose, glycated hemoglobin, homocysteine and serum cholesterol using authenticated methods.

RESULTS: Homocysteine levels have shown a significant rise in diabetic patients with complications when compared with controls ($p < 0.001$). This trend was not observed in type 2 diabetics with no history of CAD when compared with control group ($p > 0.05$). Plasma glucose ($p<0.001$) and glycated hemoglobin ($=0.001$) was significantly high in both the diabetic groups when compared with the controls. The levels of serum cholesterol was significantly high in diabetics with complications ($p< 0.001$) when compared with controls and also diabetic patients with no history of CAD.

CONCLUSIONS: A rise in the homocysteine concentration in type 2 diabetic patients with episodes of CAD in this small population has indicated a positive correlation of high homocysteine with atherosclerosis. Hence there is a need for homocysteine estimation along with the lipid profile for routine screening of patients at risk for developing atherosclerosis, especially in diabetics. Hence homocysteine estimation can be used as an early marker to predict and prevent cardiovascular diseases.

Cardiovascular disease

Cod: 0373

BUTYRYLCHOLINESTERASE IS POSITIVELY ASSOCIATED WITH TOTAL CHOLESTEROL, LOW DENSITY LIPOPROTEIN CHOLESTEROL AND TRIGLYCERIDES

V. Natalia[2], E. Angelos[2], B. Vassiliki[1], B. Maria[2], K. Christina[1], V. Evangelos[2], A. Peter[2], B. John[2], P. Demosthenes[1]
[1]*Harokopio University of Athens*
[2]*Polykliniki General Hospital*

BACKGROUND: Although butyrylcholinesterase is widely distributed in different tissues of the human body, its physiologic role has not yet been defined. This study aimed to explore the relationship between butyrylcholinesterase and lipids levels, among apparently healthy adults.

METHODS: During 2009, 490 volunteers that visited the outpatients' office of our hospital for routine examinations, were consecutively enrolled in the study. Biochemical analyses were performed through established procedures, after 12h fasting and haematological as well as biochemical parameters were measured. Anthropometric, lifestyle and dietary characteristics were also recorded to account for potential confounding.

RESULTS: Butyrylcholinesterase activity was correlated with glucose, low density lipoprotein cholesterol, total cholesterol, triglycerides, uric acid, haptoglobin, and platelets count, after age-sex adjustments. Further adjustment for a series of anthropometric, lifestyle and clinical characteristics revealed that only body mass index, low density lipoprotein cholesterol, total cholesterol and triglycerides were positively associated with serum butyrylcholinesterase activity.

CONCLUSIONS: This study demonstrated the positive association of serum butyrylcholinesterase activity with body mass index, low density lipoprotein-cholesterol, total cholesterol and triglycerides, a fact that could state a hypothesis for a novel marker of atherosclerotic disease that could -together with other biomarkers- improve our potential to assess cardiovascular disease risk.

Cardiovascular disease

Cod: 0374

THE MTHFR GENOTYPES INFLUENCE THE EFFICACY OF B9 AND B12 VITAMINS SUPPLEMENTATION TO LOWERING PLASMA TOTAL HOMOCYSTEINE IN HEMODIALYSIS

A. Ons[1], E. Sahbi[2], Z. Dorsaf[2], O. Asma[1], M. Amira[1], R. Jihene[1], B. Imene[1], N. Souhir[1], B. Lobna[1], B.R. Nabila[1], A. Lotfi[2], B. Ali[1]

[1]*LR 12 SP 11, Biochemistry Department, CHU Sahloul Sousse, Tunisia*
[2]*Nephrology Department, CHU Sahloul Sousse, Tunisia*

BACKGROUND: Hyperhomocysteinaemia, an independant risk factor for cardiovascular diseases, is common in hemodialysis patients (HD) and particularly in those homozygous for polymorphism of the 5,10-methylenetetrahydrofolate reductase (MTHFR) gene. B vitamins supplementation has been shown to lower plasma total homocysteine (tHcy), but this has been contreversed in several groups. The aim of our study was to explore the response of tHcy in hemodialysis (HD) patients to individual supplementation with folic acid (B9) and/or vitamin B12, based on carrier status for the MTHFR polymorphism.

METHODS: 132 HD were randomized according to C677T MTHFR genotypes into 2 groups (A and B, in each 34CC, 22CT and 10TT). The group(A) was treated initially with B9 (10mg/day orally) for 2 months(t1) and then with B12 vitamin (cyanocobalamin ampoule of 1000μg) for the following 2 months(t2), then association of B9 and B12 for 2 months(t3). Whereas, the group(B) was supplemented initially with vitamin B12(t1), then with folic acid(t2) and then association of B9 and B12 for 2 months(t3). A wash-out period of 2 months followed the treatment in both groups(t4). We determined tHcy, B9 and B12 vitamins concentrations at times t0, t1, t2, t3 and at the end of the trial(t4). The study was approved by the Medical Ethical Committee of the University Hospital and all patients gave written informed consent.

RESULTS: In group A, we noted that the decrease in tHcy becomes significant for CC when patients were supplemented with vitB12 only(p=0,009). While, B9+vitB12 supplementation did not seem to improve a significant effect compared with B12 alone. For genotypes (CT) and (TT) we noticed a significant decrease in tHcy at t1(p 0.038;0.005 respectively) and at (t3;CTp=0.024;TTp=0.017). In group B, for genotypes CC, the decrease in tHcy became significant at t3(vitB12+B9;p=0.031). For genotypes (CT) and (TT). At the replacement of vitB12 by B9 tHcy was significantly decreased(p:0.036;0.012,respectively). The combination of the 2 vitamins(t3) showed no difference compared to folate alone. In the 2groups (at t4), there was an significant increase of tHcy again for 3 genotypes.

CONCLUSIONS: Supplementation with B vitamins correlated to the MTHFR genotypes has been shown to lower significantly tHcy in HD patients.

Cardiovascular disease

Cod: 0375

EFFECT OF LIPOIC ACID ON SERUM PARAOXONASE, ARYLESTERASE AND LACTONASE ACTIVITIES IN MYOCARDIAL INFARCTED DIABETIC AND NON-DIABETIC RATS

E. Ozgun[2], G. Sayılan Ozgun[2], U. Usta[3], S. Eskiocak[2], N. Sut [1], S. Suer Gokmen[2]
[1]*Department Of Biostatistics And Medical Informatics, Medical Faculty, Trakya University, Edirne*
[2]*Department Of Clinical Biochemistry, Medical Faculty, Trakya University, Edirne*
[3]*Department Of Pathology, Medical Faculty, Trakya University, Edirne*

BACKGROUND: Paraoxonases-1 which has paraoxonase, arylesterase and lactonase activities, is an antioxidant and anti-atherosclerotic enzyme. Atherosclerosis is also one of the major complications of diabetes which increases the risk of cardiovascular diseases. We investigated the effect of lipoic acid, an antioxidant, on serum paraoxonase, arylesterase and lactonase activities in myocardial infarcted diabetic and non-diabetic rats.

METHODS: Rats were divided randomly into five groups as control, infarction, lipoic acid+infarction, diabetes+infarction and diabetes+lipoic acid+infarction. To induce diabetes, a single dose of streptozotocin (40 mg/kg) was injected intraperitoneally to diabetic groups. Rats with blood glucose higher than 300 mg/dL were considered diabetic. Lipoic acid (10 mg/kg/day) to lipoic acid+infarction and diabetes+lipoic acid+infarction groups was injected intraperitoneally for 14 days. To induce infarction, isoproterenol (85 mg/kg/day) was injected intraperitoneally to infarction groups on the days 13 and 14 of lipoic acid treatment. 24 hour after the last isoproterenol injection, all rats were sacrificied. Myocardial infarction was confirmed histopathologically. Serum paraoxonase, arylesterase and lactonase activities were measured by using paraoxon, phenylacetate and dihydrocoumarin as substrate.

RESULTS: Serum paraoxonase-1 activities of control group were significantly higher than the other groups. Serum paraoxonase-1 activities of lipoic acid+infarction group were significantly higher than infarction, diabetes+infarction and diabetes+ lipoic acid+ infarction groups.

CONCLUSIONS: Serum paraoxonase, arylesterase and lactonase activities decrease in isoproterenol-induced myocardial infarcted diabetic and non-diabetic rats. Lipoic acid treatment increases these activities in myocardial infarcted non-diabetic rats but has no significant effect on myocardial infarcted diabetic rats.

Cardiovascular disease

Cod: 0376

PROGNOSTIC VALUE OF GALECTIN-3 IN ARRHYTHMOGENIC RIGHT VENTRICULAR DYSPLASIA/CARDIOMYOPATHY

U. Ozturk[1], I. Onur[2], E.B. Karaayvaz[2], O. Erdogan [2], A.K. Bilge [2], E. Ademoglu[1]
[1]*Istanbul Faculty of Medicine, Department of Biochemistry, Istanbul University*
[2]*Istanbul Faculty of Medicine, Department of Cardiology, Istanbul University*

BACKGROUND: Arrhythmogenic right ventricular dysplasia/cardiomypathy (ARVD/C) is a form of genetic cardiomyopathy with structural abnormalities in the right ventricle (RV). The disease is characterized by with cardiac arrhythmias originating in the right ventricle, heart failure, and sudden cardiac death. It is suggested that the RV myocardium is progressively replaced with fatty and fibrous tissue through a transforming growth factor-beta associated mechanism. Galectin-3 is a lectin protein which is secreted from macrophages in response to a variety of mechanical and neurohormonal stimuli. It stimulates procollagen I synthesis in several cells including myofibroblasts and fibroblasts which is then irreversibly cross linked to form collagen and take role in cardiac fibrosis. Although galectin-3 is accepted as an important determinant in the clinical outcome of left ventricular heart failure and higher levels are associated with poor prognosis, its diagnostic/prognostic value in ARVD/C is not known.

METHODS: In the present study, serum galectin-3 level of 20 patients with ARVD/C (17 men and 3 women) and 19 controls (12 men and 7 women) were measured using ELISA kits.

RESULTS: Our results showed that ARVD/C patients have significantly higher serum galectin-3 levels than the healthy controls (10.04 ± 10.07 vs. 5.46 ± 2.83 ng/mL, $p<0.05$).

CONCLUSIONS: As a result higher galectin-3 levels are not only a prognostic determinant in left ventricular heart failure but, it may also have a prognostic value in the assessment patients with ARVD/C.

Cardiovascular disease

Cod: 0377

ANTIOXIDANT CAPACITY AND LIPID PEROXIDATION OF CORONARY ARTERY DISEASE PATIENTS IN SOUTHERN INDIA

S. P[3], J.R. Peela[1], A. Jarari[2], S. Shakila[1], V.B. Madrol [4], R. Kondreddy[3]
[1]*Department of Biochemistry, Faculty of Medicine, Quest International University Perak, 30250 Ipoh, Malaysia*
[2]*Department of Biochemistry, Faculty of Medicine, University of Bengahzi, Libya*
[3]*Department of Biochemistry, Mamata Medical College, Khammam, AP, India*
[4]*Mamata Medical College, Khammam, AP, India*

BACKGROUND: Coronary Artery Disease (CAD) is the leading cause of mortality and morbidity across the globe. Prevalence of CAD is alarmingly increasing in developing countries. India is also experiencing the same with the increasing urbanization, changing lifestyles and obesity. Present study is focused on estimation of lipid peroxidation and antioxidant capacity of CAD patients in correlation with lipid profile, obesity and other risk factors.

METHODS: The study was conducted in the department of biochemistry, Mamata Medical College and General Hospital, Khammam, Andhra Pradesh, India. The patients attending outpatient and wards of cardiology and general medicine departments of hospital and local cardiac centers were included in this study. Study group comprised of 145 patients diagnosed as CAD with an age group of 30–50 patients with associated risk factors i.e., Diabetes, hypertension, smoking. And alcoholism. Patients with previous history of CAD and with renal dysfunction were excluded from the study. 66 sex and age matched subjects were recruited as control group (non CAD cases) using the same criteria. All patients and controls were measured melanaldehyde (MDA) as measure of lipid peroxidation, total antioxidant capacity (TAC), lipid profile by using authentic methods available. These patients were also divided as per their Body Mass Index (BMI) with associated risk factors.

RESULTS: In present study, there is significant increase in the values of serum cholesterol ($p<0.0001$), Low density lipoprotein cholesterol (0.0001) and significant decrease in mean High density lipoprotein cholesterol ($p<0.0001$) level was observed in CAD cases when compared with controls. Levels of MDA ($p<0.0001$) was significantly increased and TAC ($p<0.0001$) was significantly decreased in CAD cases when compared with controls. MDA has positive correlation with cholesterol and low density lipoprotein cholesterol. TAC has negative correlation with MDA, cholesterol and low density lipoprotein cholesterol.

CONCLUSIONS: Increased lipid peroxidation and decreased TAC was observed in CAD cases. MDA and TAC have shown correlation with raised lipids in CAD cases with BMI and waist circumference.

Cardiovascular disease

Cod: 0378

BIOCHEMICAL MARKERS IN SUSPECTED ACUTE MIOCARD INFARCTION PATIENTS

S. Pancevska[1], S. Biljali[1], G. Jovanovski[1], S. Petrovska[2], B. Dejanova[2], V. Antevska[2]
[1]*Clinical Biochemistry Unit, Clinical Center Skopje*
[2]*Institute of Physiology*

BACKGROUND: Prehospital assessment of suspected patients for acute myocardial infarction (AMI) is important for their diagnosis and prognosis. The ability to identify and to react to AMI may be useful to predict mortality. The aim of this study is to clarify the prognostic meaning of different biochemical parameters.

METHODS: A number of 49 male patients (mean age 58±15 years) who were suspected of AMI, were exposed to cardiac markers and enzyme status investigation: cardiac troponin (TI); creatine phosphokinase (CPK) creatine kinase (CPK-MB) and lactate dehydrogenase (LDH). The patients were divided concerning TI value into 3 groups: I group -TI below 2 ng/ml (n= 24); II group - TI 2 - 20 ng/ml (n=13) and III group - TI above 20 ng/ml (n=12). For TI, Architect assay from Abbott Diagnostics was performed, while for the enzyme status spectrophotometry assay, Integra 400 Roche was used. For statistical significance between the patient groups t-test was used for $p<0.05$. Pearson's coefficient for correlation analysis between the groups was performed.

RESULTS: In the I group TI showed value of 0.66±0.5 ng/ml, II 8.01±6.01ng/ml III group 27.94±10.49ng/ml ($p<0.01$). The level of CPK was found to follow the increased value of TI: in I group 331±265 U/L, in II group 521±325 U/L and in III group 992 ±329 U/L ($p<0.05$) as well as for CPK-MB: in I group 32±11 U/L, in II group 85±57 U/L and III group 123±60 U/L ($p<0.01$) and for LDH: in I group 440±137 U/L, in II group 931±696 and in III group 1096 ±569 U/L ($p<0.05$).

CONCLUSIONS: Although cardiac imaging usually confirms AMI, cardiac biomarker TI and enzyme status might be a good base for the initial testing strategy which is step forward to right diagnosis. Further investigation is needed to verify the importance of cardiac biomarker and other laboratory parameters in infarct size within the first days of its appearance.

Cardiovascular disease

Cod: 0380

COMMUTABILITY ASSESSMENT OF CANDIDATE REFERENCE MATERIALS FOR CARDIAC TROPONIN I (CTNI): RESULTS OF AN IFCC PILOT PROJECT

M. Panteghini[1], J. Tate[8], D. Bunk[6], R. Christenson[3], J. Barth[2], A. Katrukha[5], J. Noble[7], H. Schimmel[4], L. Wang[6]
[1]*Centre for Metrological Traceability in Laboratory Medicine, University of Milan, Milano, Italy*
[2]*Clinical Biochemistry, Leeds Teaching Hospitals NHS Trust Leeds General Infirmary, Leeds, UK*
[3]*Department of Pathology, University of Maryland School of Medicine, Baltimore MD, USA*
[4]*European Commission, Joint Research Centre, Institute for Reference Materials and Measurements, Geel, Belgium*
[5]*HyTest Ltd, Turku, Finland*
[6]*National Institute of Standards and Technology, Gaithersburg MD, USA*
[7]*National Physical Laboratory, Teddington, UK*
[8]*Pathology Queensland, Department of Chemical Pathology, Royal Brisbane and Women's Hospital, Herston, Qld, Australia*

BACKGROUND: The IFCC WG-TNI performed a pilot study, in collaboration with industry, to investigate the feasibility of preparing a stable, commutable, pooled serum cTnI reference material (RM). A goal of the study was the commutability assessment of candidate RMs which were prepared from different pooling and dilution strategies.

METHODS: cTnI-positive serum samples from 90 patients, presenting to the emergency department with suspected acute myocardial infarction, were used to prepare seven pools with cTnI concentrations in the range, 200-10,000 ng/L. All pools were assessed for commutability through measurement by 16 commercial cTnI assays according to pre-defined testing protocols. The 90 individual patient samples were also measured for the commutability assessment of the candidate RMs.

RESULTS: Through pair-wise comparisons of the commercial assay measurement results of both the candidate RMs and 90 individual patient samples, it was observed that all candidate RMs behaved equivalent to patient samples for all assays. Specifically, in pair-wise linear regression analysis of assay results, the measurement data from the candidate reference materials all fell within the 95% prediction interval of the Passing-Bablok regression line derived from the individual patient samples.

CONCLUSIONS: We observed that all candidate serum cTnI RMs evaluated in the pilot study were commutable with all 16 commercial assays used in the study. From the results of the pilot study, the WG-TNI has developed a plan for the production of a serum-based certified reference material for cTnI.

Cardiovascular disease

Cod: 0381

HIGH SENSITIVE CARDIAC TROPONIN T STAT ASSAY ON THE COBAS E 411

Y. Patokova[2], A. Chalyovska-Tsencova [2], I. Petrov[1]
[1]*City Clinic, Department of Cardiology*
[2]*City Clinic, Department of Laboratory Medicine*

BACKGROUND: Troponin T High Sensitive Short Turnaround Time (TnT hs STAT) –Roche Diagnostics- is useful in early diagnosis of acute coronary syndrome and myocardial infarction (MI). Cardiac Troponin T is a 39.7 kDa protein that is part of troponin I-C-T complex which serves to regulate actin and myosin filament interaction. This assay employs two monoclonal antibodies. The antibodies recognize two epitopes located in the central part of the cardiac TnT. Assay sensitivity has been increased by increasing the sample volume from 15 to 50 µl. increasing the ruthenium concentration the detection antibody, and lowering the background signal by buffer optimization. The precision at 99-th percentile is equal or below 10%CV.The recommendation for assay precision in the „universal definition of MI"is fulfilled. The assay has a calibration curve spanning 3-10000 ng/l (pg/ml). Total duration of assay: 9 minutes.

METHODS: We calculated total precision (CV) use Roche reagents and controls - PreciControl Troponin 1&2(PC TN1& PC TN2), 1 per day for 56 days.

RESULTS: Precision CV ranges from 1.08 to 3.47%. This is the lower than reported from the Roche.

CONCLUSIONS: These results demonstrate that the TnT hs STAT assay is a precise and highly sensitive method for measuring Cardiac Troponin T on an analyzer, especially for identifies patients with risk at very low levels of TnT.

Cardiovascular disease

Cod: 0382

ANALYTICAL PERFORMANCE EVALUATION OF THE ABBOTT DIAGNOSTICS ARCHITECT I1000SR HIGH SENSITIVE TROPONIN-I ASSAY

D. Polak Erceg[1], V. Šenjug[1]
[1]*Special Hospital for Medical Rehabilitation Krapinske Toplice, Croatia*

BACKGROUND: New methods have been developed for measuring high-sensitive Troponin in the diagnosis of acute coronary syndrome (ACS). We evaluated the analytical performance of the Abbott High Sensitive Troponin-I (hsTnI) chemiluminescent microparticle immunoassay on the Architect i1000SR analyzer.

METHODS: Repeatibility, between run, within-laboratory precision and trueness were determined using the commercial control samples. Coefficients of variation (CV Sr, CV Sb and CV Sl) were calculated (L1, L2, N=15) and compared to the acceptance criteria declared by the manufacturer for the appropriate concentration levels. The bias was calculated (L1, L2, L3, N=10) and compared to the acceptance criteria declared by the manufacturer. Additionally, concentration of hsTnI was compared with the previously used Troponin-I method (TnI) on the Architect i1000SR for 40 patient samples in the range from 1,1 ng/L to 50000 ng/L. Linearity was assessed by assaying a serially-diluted patient sample pool across the width of the measuring range and comparing expected versus observed results. Samples from 20 healthy donors (10F, 10M, age 21-73y) were analyzed to verify that the manufacturers references values are transferable to own population.

RESULTS: Satisfactory results were obtained for repeatibility, between run and within-laboratory precision; CV Sr, CV Sb and CV Sl at 20 ng/L was 3,3%, 1,2%, 2,9% and 2,6%, 0,9%, 2,3% at 200 ng/L. Deviation from declared control sample values showed a satisfactory level of accuracy; bias at 20, 200 and 15000 ng/L was 1,0%, -2,8% and -0,7% (Acceptance criteria declared by the manufacturer: within-laboratory total CV at 20 ng/L < 4,3%, at 200 ng/L < 3,1%, bias ≤ 10%). HsTnI correlated well with the previously used Abbott Architect TnI method. Linear regression was; y (hsTnI)= 0,96x (TnI) -0,40 and R^2= 0,99 (N=40, 1,1-50000 ng/L).The linearity of the method was confirmed; R = 0.9998. The observed deviation from linearity was 0,7-2,6% for samples >10 ng/L and 0,6 ng/L for sample <10 ng/L. Manufacturers references values are confirmed.

CONCLUSIONS: We conclude that the Abbott Architect hs Troponinn-I assay is a reliable, accurate and precise method, shows good agreement with existing assay and could be implemented in a routine laboratory work.

Cardiovascular disease

Cod: 0383

SERUM NT-PROBNP LEVELS IN ADULT PATIENTS WITH TRANSPOSITION OF THE GREAT ARTERIES AFTER SENNING, MUSTARD OR RASTELLI SURGERY

K. Kotaska[3], J. Popelova[2], S. Cerny[1]

[1]*Department of Cardiac Surgery, Hospital Na Homolce, Prague, Czech Republic*

[2]*Department of Cardiac Surgery, Hospital Na Homolce, Prague, Czech Republic, Pediatric Heart Centre, Faculty Hospital Motol, Prague, Czech Republic*

[3]*Department of Medical Biochemistry and Clinical Biochemistry, 2nd Faculty of Medicine, Charles University, Faculty Hospital Motol, Prague, Czech Republic*

BACKGROUND: Elevated levels of the N-terminal pro-brain natriuretic peptide (NT-proBNP) are an expected finding in many adults with congenital heart disease. Aim of the study was to investigate serum NT-proBNP levels in adults with transposition of the great arteries.

METHODS: Serum NT-proBNP levels were measured in control group of 56 healthy individuals and in consecutive group of 93 adult patients with transposition of the great arteries. From the cohort group of 93 patients, 4 patients were unoperated and 89 patients were operated in childhood including 48 patients with Mustard correction, 33 patients with Senning surgery and 8 patients with Rastelli procedure.

RESULTS: Concentration of NT-proBNP in patients with transposition of great arteries are significantly elevated compared to the control group of healthy individuals (203.5 pg/ml vs. 42 pg/ml, $p<0.0001$). Patients after the Mustard repair of TGA had significantly elevated NT-proBNP values than both those after the Senning operation (233.5 pg/ml vs. 148 pg/ml, $p = 0.0023$) and after the Rastelli operation (233.5 pg/ml vs. 139.2 pg/ml, $p = 0.028$). Patients with unoperated TGA had significantly elevated NT-proBNP levels in comparson with operated patients ($p = 0.0004$).

CONCLUSIONS: Elevated levels of N-terminal pro-brain natriuretic peptide (NT-proBNP) appear to be a useful tool in assessing heart failure in patients with transposition of the great arteries after different types of the surgery.
Supported by Ministry of Health, Czech Republic - conceptual development of research organization (Nemocnice Na Homolce – NNH, 00023884

Cardiovascular disease

Cod: 0384

PREVALENCE OF OBESITY AND DYSLIPIDAEMIA IN SENIOR HOSPITAL STAFF- A PILOT STUDY

O.O. Popoola[1]
[1]*Chemical Pathology Department, University College Hospital, Ibadan, Nigeria*

BACKGROUND: Obesity and dyslipidaemia are modifiable risk factors for cardiovascular disease.This study aims to determine the prevalence of obesity and dyslipidaemia in senior staff of Adeoyo maternity teaching hospital, Ibadan, Nigeria.

METHODS: 20 subjects (consisting of 17 women and 3 men) were selected by simple random sampling technique from the senior staff list of Adeoyo Maternity Teaching Hospital, Ibadan, Nigeria. Obesity was assessed by percentage body fat (% BF), waist circumference (WC), hip circumference (HC), waist to hip ratio (WHR) and body mass index. Lipids (total cholesterol, triglycerides, low density lipoprotein cholesterol and high density lipoprotein cholesterol) levels were determined using standard laboratory procedures. Dyslipidaemia is defined as total cholesterol (TC) greater than 200mg/dl or triglycerides (TG) greater than 150mg/dl or low density lipoprotein cholesterol (LDL-C) greater than 130 mg/dl or high density lipoprotein cholesterol (HDL-C) less than 40 mg/dl in men and postmenopausal women or less than 50 mg/dl in premenopausal women.

RESULTS: The mean age and BMI of all the subjects was 47.35 ± 8.09 years and 28.23 ± 4.89 (kg/m^2) respectively. Mean %BF, WC and HC in men were 28.33 ± 2.91 %, 101.2 ± 1.92 cm, 104.3 ± 4.08 cm respectively while the mean %BF, WC and HC in women were 39.31 ± 7.03%, 96.78 ± 10.86 cm, 110.33 ± 7.89 cm. Six subjects (30%) were found to be obese while 10(50%) were overweight . Five subjects (25%) had both TC and LDL-C level above the desirable level while twelve individuals (60%) had low HDL-C according to US National Cholesterol Education Program (NCEP) guidelines. All subjects had normal triglycerides. Nine subjects (45%) subjects had only one lipid abnormality all of which are of low HDL-C levels, two (10%) subjects had a combination of two abnormal lipid levels while three subjects (15 %) subjects had a combination of three abnormal lipid levels. Eleven individuals had one or more lipids out of the desirable level giving an overall prevalence of dyslipidaemia of 64.7%.

CONCLUSIONS: Obesity and dyslipidaemia appear to be common features of this population. Educational programs should be embarked on to prevent imminent cardiovascular disease epidemic in the future.

Cardiovascular disease

Cod: 0385

HIGH-SENSITIVITY CARDIAC TROPONIN T FOR THE DIAGNOSIS OF ACUTE CORONARY SYNDROME IN PATIENTS WITH CHEST PAIN AND NEGATIVE TROPONIN CONCENTRATIONS

C.M. Puche Morenilla[1], J.A. Vilchez Aguilera[1], D. Hernández Romero[1], I. De Miguel Elizaga[1], T. Casas Pina[1], F. Marin Ortuño[1], J.A. Noguera Velasco [1]
[1]*University Hospital Virgen de la Arrixaca*

BACKGROUND: Although high-sensitivity cardiac troponin T (hs-cTnT) allows an early diagnosis of acute myocardial infarction, its role for identification of acute coronary syndrome (ACS) in patients with normal conventional troponin remains unclear. We aimed to evaluate the diagnostic performance of hs-cTnT in patients with chest pain and possible acute coronary syndrome with an initially negative conventional troponin T test.

METHODS: The study group consisted of 155 patients admitted to the emergency room with acute chest pain of possible coronary origin with a negative conventional cardiac troponin T (cTnT) concentration at admission and 4 hours later. Patients were excluded if they had an ST-segment elevation acute myocardial infarction. Samples were collected and stored at -800C until analysis. Hs-cTnT values at admission (hs-cTnT1) and 4 hours later (hs-cTnT2) were analyzed for the diagnostic performance.

RESULTS: The diagnoses according to conventional troponin test were 33 patients (21.4%) with unstable angina (UA) and 121 (78.6%) patients with non ACS. With the analysis of hs-cTnT, 40 (26%) patients with negative conventional cTnT values already had increased hs-cTnT at admission, which leads to a decrease in cases of unstable angina (from 21% to 15%). Levels of hs-cTnT were significantly higher in patients with UA [14.4 (7.4-22.8) ng/L] compared with non-ACS patients [7.6 (5.3-12.4) ng/L] ($p<0.001$). The overall ROC-AUC value for ACS diagnosis of hs-cTnT1 and hs-cTnT2 were 0.694 and 0.722, respectively. The variables that remain independently associated with the presence of ACS in the logistic regression multivariate analysis were being a smoker [OR= 7.03 (95% CI: 1.62-30.43), p: 0.009], having a recent severe angina [OR=3.97 (95% CI: 1.01-15.56), p: 0.048] and the elevation of hs-cTnT [OR=5.99 (95% CI: 1.27-28.33), p: 0.024].

CONCLUSIONS: The hs-cTnT increase the number of subjects diagnosed with non-Q infarction. The diagnostic performance of the new hs-cTnT assay is useful for the early diagnosis of ACS but troponin results should be evaluated together with clinical history, ECG changes and imaging.

Cardiovascular disease

Cod: 0386

ST2: CARDIAC BIOMARKER FOR MONITORING HEART FAILURE - OUR PRELIMINARY RESULTS

Z. Ramsheva[2], K. Ramshev[1]
[1]*Military Medical Academy Sofia Bulgaria, Department of Cardiology and Intensive Therapy*
[2]*Military Medical Academy Sofia Bulgaria, Department of Clinical Laboratory and Immunology*

BACKGROUND: ST2 is a soluble protein expressed by the heart in response to disease or injury. It is reflective of ventricular remodeling and cardiac fibrosis associated with heart failure (HF). ST2 is not influenced by factors such as age, BMI and impaired renal function, but its' levels change quickly in response to patient condition. That helps physicians to quickly adjust patients' treatment. That fact makes ST2 an ideal biomarker for monitoring HF.

METHODS: One hundred and ten (110) patients admitted for acutely decompensated HF in the Department of Intensive Care and Cardiology have been tested for NT-pro BNP (a marker of myocardial stretch), Tn I (a marker of myocite injury), and soluble ST2, together with CK, CK-MB, Homocystein, Il-6, hs- CRP and routine clinical chemistry parameters at the beginning of the therapy and at discharge from the hospital.

RESULTS: The preliminary data confirms the potential of this new biomarker- ST2, either alone, or as a part of a multimarker strategy for both predicting readmission to the hospital, for prognosis of the patients with HF, as well as for monitoring his therapy.

CONCLUSIONS: Furthermore, the study confirms that ST2 is not only a predictive marker for patients with HF but is also additive to natriuretic peptide levels in its' prognostic value.

Cardiovascular disease

Cod: 0387

THE INFLUENCE OF IMPLEMENTATION OF THE EUROPEAN SOCIETY OF CARDIOLOGY GUIDELINES ON A NUMBER OF TROPONIN REPORTS IN EMERGENCY LABORATORY

V. Rimac[1], R. Galović[1], D. Rogić[1]
[1]*University Hospital Centre Zagreb*

BACKGROUND: According to the guidelines of the European Society of Cardiology (ECS), the diagnosis of acute myocardial infarction (AMI) is made according to criteria that include an increase in cardiac markers (troponin) with the presence of characteristic clinical symptoms or electrocardiogram changes or imaging of myocardial damage. At the Department of Emergency Medicine, University Hospital Centre Zagreb, the use of the ECS guidelines was introduced in year 2013. In an emergency laboratory high-sensitive troponin (hs-TnT) is used for determination of troponin (TnT). The guidelines define dynamic determination of TnT, i. e. at patient admission and after three hours. The decision cut-off point for definition of AMI is the 99th percentile in the general population with the coefficient of variation of less than 10%. The 99th percentile for the hs-TnT test that we routinely used is 0.014 μg/L and the lower detection limit is 0.003 μg/L. To facilitate physicians' understanding, we have provided the comment with each TnT report: "The values exceeding 0.014 μg/L indicate the presence of cardiac damage. In patients with clinically suspected AMI, changes in value ≥ 0.007 μg/L after 3 hours may assist in diagnosis confirmation". The aim of this study was to investigate how the application of new guidelines affected the number of requests for determining TnT concentration.

METHODS: We compared the number of patients for whom the TnT analysis was requested during three months in 2012 and 2013 and the number of released TnT reports in these periods. Data were taken from the laboratory information system. For statistical analysis, the chi-square test was used.

RESULTS: The number of patients with requested TnT analysis in 2012 was 1109/1091/1046 and in 2013 it was 1150/1152/1134 (October/November/December, respectively). The number of released TnT reports in 2012 was 1267/1194/1186 and in 2013 it was 1402/1414/1407. Statistical analysis showed significant increase in the number of released TnT reports ($p<0.05$) with no differences in the number of patients with requested TnT analysis ($p>0.05$).

CONCLUSIONS: During the period of observation in 2013 there was a significant increase in the number of released TnT reports, which is attributed to the application of ECS guidelines.

Cardiovascular disease

Cod: 0388

IS THERE THE ASSOCIATION BETWEEN CASPASE-3 ACTIVITY AND ATHERSCLEROTIC PLAQUE ACTIVITY IN PATIENTS WITH ISCHEMIC HEART DISEASE ?

T. Ristic[1], V. Cosic[1], M. Deljanin Ilic[2], V. Djordjevic[3], S. Kundalic[1], P. Vlahovic[1]
[1]*Center for Medical Biochemistry, Clinical Center, Nis*
[2]*Institute for Cardiovascular and Rheumatic Diseases, Niska Banja, Serbia*
[3]*Institute of Biochemistry, Medical Faculty, Nis, Serbia*

BACKGROUND: Apoptotic cell death may play a critical role in a variety of cardiovascular diseases and may occur in response to ischemia, toxins and physical stimuli. A key phenomenon of apoptotic cell death is the activation of one of the effector caspase- Caspase-3, which may be activated by both extrinsic and intrinsic apoptotic pathways. Caspase-3 activation leads to DNA fragmentation and cell death.

METHODS: In this study, the activity of caspase-3 was determined in lymphocytes of peripherial blood isolated using lymphocyte separation medium. Caspase-3 activity was measured by a colorimetric commercially available ELISA kit based on the degradation of synthetic tetrapeptide DEVD-pNa. Enzyme activity was determined in lymphocytes of patients with stable angina (SAP, 30), with unstable angina pectoris (USAP, 26), and with acute myocardial infarction (AMI, 38). The obtained results were compared to the caspase-3 values of the control group (healthy individuals).

RESULTS: In lymphocytes of patients with SAP the enzyme activity was 0.093±0.035 μmol/mg protein, but, in patients with AMI 0.110±0.062 μmol/mg protein, and both values were unsignificantly higher in comparison with controls (0.092±0.022 μmol/mg protein). In lymphocytes of NSAP patients caspase-3 activity (0.122±0.061 mol/mg protein) was significantly higher ($p<0,05$) compared to the control as well as both other patient groups.

CONCLUSIONS: Caspase-3 activity may be valid parameter for assessing of atherosclerotic plaque activity and a new target for therapeutic intervention.

Cardiovascular disease

Cod: 0389

ASSOCIATION BETWEEN TOTAL PLASMA HOMOCYSTEINE LEVEL AND PERIPHERAL ARTERY DISEASE IN EAST ALGERIAN SUBJECTS

B. Cherifa[2], H. Sabah[2], B. Karima[2], S. Karima [2], K. Nacera[3], A. Noreddine[2], Z. salima[1], R. Daoud[3]

[1]*1. Biochemistry Service, Ibn Badis Hospital, Faculty of Medicine, Constantine, Algeria*

[2]*1. Biochemistry Service, Ibn Badis Hospital, Faculty of Medicine, Constantine, Algeria. 2. Laboratory of Biology and Molecular Genetics, Faculty of Medicine, Constantine, Algeria*

[3]*3. Department of Internal Medicine, Ibn Badis Hospital, Constantine, Algeria*

BACKGROUND: The role of hyperhomocysteinemia in vascular and thromboembolic disease has been researched and widely debated since 1969 when McCully described significant vascular disease in patients with markedly elevated plasma homocysteine levels (tHcy). tHcy is thought to increase thrombotic risk by inducing endothelial injury in venous and arterial vasculature; however, the precise prothrombotic mechanisms are poorly understood. Our aim was to evaluate the possible association between homocysteine levels and peripheral arterial disease (PAD) in East Algerian subjects.

METHODS: The study included 74 patients with PAD and 116 healthy controls. Patients and control subjects were evaluated for the presence of major vascular risk factors as hypertension, diabetes mellitus, BMI, physical activity and cigarette smoking. Peripheral blood samples were obteined from all subjects after overnight fast immediately centrifuged, aliquoted and frozen at -80°C until the time of use. Serum Hcy level was measured by a competitive chemiluminescent immunoassay (Immulite,Medical Systems).

RESULTS:
- Patients: Age ranged from 27 to 90 years,with a mean of 62 years. Subjects were 54 males (72.97%) and 20 females (27.03%) with a male-female ratio = 2.7. Men with PAD had higher homocysteine levels 18.5 μmol/L compared to women 16.53 μmol/L. 34 (45.95%) were hypertensive, 65 (87.84%) have diabetes, 34(45.95%) were smoker and only 9 (12.16%) have physical activity ,the BMI mean value was 26.48,
- Healthy controls: Age ranged from 35 to 74 years, with a mean of 49 years. Subjects were 54 males (47.79%) and 59 females (52.21%) homocysteine levels was higher in men (15.89 μmol/L) than in women (12.05 μmol/L). 32(28.32%) were smoker and 26 (23%) have physical activity, the BMI mean value was comparative with patients (27.37).

CONCLUSIONS: The primary finding of this study is that patients with PAD have significantly higher plasma homocysteine levels compared to control subjects. The mean level of Hcy was higher in male subjects both in patients and controls. This study shows also that hypertension, diabetes, smoke and physical inactivity were significantly associated with increased risk of PAD our results agrees with literature 's data.

Cardiovascular disease

Cod: 0390

NTPROBNP IDENTIFIES PATIENTS AT HIGH RISK OF POSTOPERATIVE ATRIAL FIBRILLATION SUITABLE OF PREVENTIVE THERAPY

M. Salvatici[1], D. Cardinale[1], G. Facchi[1], A. Colombo[1], L. Spaggiari [1], M.T. Sandri[1]
[1]*European Institute of Oncology*

BACKGROUND: Postoperative atrial fibrillation (AF) is one of the most frequent complications of thoracic surgery for lung cancer, with an incidence ranging from 8 to 42%. In some studies, postoperative AF has been found to be a benign and self-limiting complication, whereas, in others, it has been related to significantly increased morbidity and mortality. The development of postoperative AF is associated with a prolonged length of hospitalization and high related costs. The identification of patients at high risk that could benefit from preventive strategies, represents a clear need. Several risk indexes have been evaluated, and recently the N-terminal pro-BNP (NT-proBNP) has emerged as an early marker predictive of post-operative AF in different surgical settings. This study was aimed at the evaluation of the efficacy of treatment with a beta-blocker or angiotensin receptor blocker, in patients with elevated perioperative values of Nt-proBNP at higher risk for AF.

METHODS: We conducted a prospective randomized controlled study in patients undergoing elective thoracic surgery for lung cancer. Patients with elevated perioperative values of NT-proBNP were randomized to receive a cardio protective therapy (Metoprolol or Losartan) or no therapy (control subjects). The primary end point was a decrease of the incidence of postoperative AF.

RESULTS: Of the 1116 cancer patients undergoing thoracic surgery enrolled from April 2008 to June 2013, 315 showed a perioperative NT-proBNP increase and were randomized to receive Metoprolol n=104 or Losartan n=101, while 110 represented the control group. All patients remained under continuous ECG monitoring until discharge. Sixty-three patients (20%) develop a postoperative AF. A significant reduction of postoperative AF events was observed in treated patients: 7% (= 7 patients) and 11% (=12 patients) in the groups receiving metoprolol or losartan respectively, compared to 40% (n=44) in the control group (P<0.001).

CONCLUSIONS: In patients undergoing elective thoracic surgery for lung cancer, a perioperative increased value of Nt-proBNP could represent an early marker useful to candidate patients to receive a therapy with beta-blocker or angiotensin to prevent the development of a postoperative AF.

Cardiovascular disease

Cod: 0391

ASSOCIATION BETWEEN SERUM PENTRAXIN LEVELS AND CORONARY ARTERY PLAQUE MORPHOLOGY IN PATIENTS WITH UNSTABLE ANGINA PECTORIS

S. Sari[1], A. Arat Özkan[2], S. Yiğit[1], İ.P. Canbolat[2], Y. Erdogan Doventas[1], M. Koldas[1], C. Bostan[2], T. Gürmen[2]
[1]*Department of Biochemistry, Haseki Training and Research Hospital, Istanbul, Turkey*
[2]*Department of Cardiology, Istanbul University Cardiology Institute, Istanbul, Turkey*

BACKGROUND: We aimed to assess the relationship between serum levels of pentraxin-3 (PTX-3) and hs-CRP and angiographic morphology of coronary plaque in Unstable Angina Pectoris (USAP) patients.

METHODS: We evaluated 74 patients with an initial diagnosis of USAP. Patients were divided into 2 groups according to the presence of angiographic coronary disease (ACD). Group 1 consisted of patients without ACD (N:33), group 2 consisted of patients with ACD (N:41). Group 2 was also divided into 2 subgroups (simple morphology, n:20; complex morphology, n:21) according to the angiographic morphology assessed by Ambrose classification.

RESULTS: Baseline characteristics are given at Table-1. Both PTX-3 and hs-CRP levels in group 2 were significantly higher than group 1 (median 3,55 vs 1,20 ng/mL p<0,01 for PTX-3; median 2,80 vs 1,90 mg/L p<0,01 for hs-CRP). In subgroup analysis, patients with complex plaque morphology had significantly higher PTX-3 levels than patients with simple morphology (median 3,94 vs 2,10 ng/mL, p<0,01). However hs-CRP levels between 2 subgroups were non-significant (median 2,80 vs 2,60 mg/L, p=0,907). On Multivariate analyses, PTX-3 levels (OR=2,2 p<0,05) and HDL levels (OR=0,905 p<0,05) were independently associated with ACD. Receiver-operating characteristic curve analysis showed that >1,57 ng/mL PTX-3 could predict USAP with 82,93% sensitivity and 69,70% specificity.

CONCLUSIONS: Higher levels of serum PTX-3 but not hs-CRP are associated with the complexity of angiographic plaque morphology.
Keywords: pentraxin-3, unstable angina pectoris, coronary plaque morphology

Cardiovascular disease

Cod: 0392

THE CONCENTRATION OF THE SVCAM-1 ADHESION MOLECULE AS A POTENTIAL INDICATOR OF THE MORTALITY RISK ASSESSMENT IN PATIENTS WITH MYOCARDIAL INFARCTION

E. Siergiejko[2], A. Lisowska[1], A. Korniluk[2], H. Kemona[2], V. Dymicka-Piekarska[2]
[1]*Department of Cardiology, Medical University, Białystok, Poland*
[2]*Department of Clinical Laboratory Diagnostics, Medical University, Białystok, Poland*

BACKGROUND: Cardiovascular diseases (CVD) are one of major causes of death worldwide. According to WHO, 17.3 million people died of CVD (30% of all deaths for global reasons) in 2008. It is expected that in 2030 this number will increase up to 23.3 million people. The risk classification determines the indications for an extended pharmacological therapy, wider diagnostics and invasive treatment. Despite the fact that there are accepted risk assessment factors, which are included, in the GRACE and TIMI scores, clinicians and diagnosticians are looking for newer, more sensitive and precise factors that can enhance the score parameters.

METHODS: The study covered 78 patients with myocardial infarction, in whom the concentration of the sVCAM-1 (soluble vascular cell adhesion molecule 1) adhesion molecule was assessed in the first 24 hours of the occurrence of coronary incidents. A three-year observation of the risk of death in the study patients was also performed. The control group consisted of 30 people of the age and sex similar to the study group. The concentration of sVCAM-1 was determined using the enzyme immunoassay method (R&D Systems, Minneapolis,USA).

RESULTS: It has been found that the mean concentrations of sVCAM-1 in patients with myocardial infarction (1190.14 ± 997.06 ng/ml) was significantly increased as compared to the control group (465.83 ± 88.68 ng/ml; $p<0.0001$). The observation of the patients in terms of the risk of death lasted three years. After the lapse of this period, we performed a statistical analysis of the risk of death vs. the level of the sVCAM-1 adhesion molecule. In patients who had died we found a significantly increased mean concentration of sVCAM -1 (2248.55 vs. 990.18 ng/ml; $p<0.0003$).

CONCLUSIONS: The results of our study showed twice higher concentration of the sVCAM-1 adhesion molecule in patients with a higher risk of death during a long-term observation after the occurrence of myocardial infarction. The determination of the probability of death after myocardial infarction leads to the selection of the high-risk group, affects the choice of the best strategy for pharmaceutical treatment and its success, which allows prolonging the survival time of the patient.

Cardiovascular disease

Cod: 0393

EVALUATION OF THE RECOMMENDATIONS FOR USE OF BNP OR NT-PROBNP IN CURRENT HEART FAILURE GUIDELINES

J. Simons[1], A. Don Wauchope[1]
[1]*McMaster University*

BACKGROUND: The B-type naturietic peptides (NPs) are recommended for use in all recent major English language clinical practice guidelines (CPGs) for heart failure (HF). Systematic review (SR) is a means of producing higher levels of evidence. The purpose of this investigation is to determine if CPG recommendations for the use of NPs: 1) show reasonable methodical rigor as assessed by the AGREE II tool (Domain 3) and; 2) use the findings of the available evidence (Domain 3, question 12; AGREE II).

METHODS: A search for English language CPGs for HF published since 2011 was undertaken using PubMed, EMBASE , Medline and Heart Failure Society webpages. A search for SRs and meta-analysis for NP in the diagnosis, prognosis, or therapy of HF was conducted for the years 2004-2013. The section(s) of each CPG recommending NPs in HF were reviewed using the AGREE II tool by two independent reviewers. Each CPG was assessed using a laboratory checklist developed from the work of Aakre et al. Key recommendations for NPs in each area were abstracted. The key findings from each SR were abstracted and compared to the recommendations of the CPGs.

RESULTS: Four English language HF CPGs were found. All made recommendations for NPs in diagnosis, 3 made recommendations for prognosis and 2 for management. A total of 14 recommendations were made. Three CPGs scored more than 60% in Domain 3 for rigor of development. Question 12 was specifically interpreted in context of NP and scored in the mid-range (3-5 out of 7) for 3 of the 4 CPGs. CPGs incorporated a variable number (27%-57%) of the important pre-analytical, analytical, and post-analytical considerations for NP testing as measured by the laboratory checklist. The American CPGs made stronger recommendations citing higher grades of evidence for the use of NPs in HF than the European and Australian CPGs. Seven of the 14 recommendations were supported by the available SRs. Of the eleven available SRs, only two were cited by two CPGs.

CONCLUSIONS: The CPGs are describing sound methodology to evaluate evidence. The CPGs do not adequately report the factors described by Aakre. The SR evidence to support NP use in CPGs has not been well cited in the CPGs. Half (7 of 14) the CPG recommendations are supported by the SR evidence.

Cardiovascular disease

Cod: 0394

RECOMMENDED CHANGES IN THE TIMING OF REPEAT TROPONIN TESTING ARE DIFFICULT TO IMPLEMENT IN PRACTICE. A RETROSPECTIVE STUDY OF PAIRED TROPONINS FROM AN EMERGENCY DEPARTMENT

J. Simons[1], A.C. Don-Wauchope[1], C. Shortt[1], A. Worster[1], P. Kavsak[1]
[1]*McMaster University*

BACKGROUND: The Third Universal Definition of Myocardial Infarction (Oct.2012) recommends at least two cardiac troponin (cTn) measurements 3-6h apart on all patients with suspected acute coronary syndrome. This timeframe requires a change in ordering practice. We investigated the concurrent impact of introducing a sensitive cTnI assay for clinical use 1 month and 6 months after the third universal definition, and after a study enforcing a 3h collection timeframe in the Emergency department (ED), to assess if ordering practice has changed.

METHODS: The collection times for the first two cTn measurements for all adult patients in the 3 EDs of a single city were obtained from electronic medical records for the following 4 time periods: Oct.27-Nov.27,2012 (cTnT-period1); Nov.29-Dec.29,2012 (cTnI-period2); Apr.1-30,2013 (month before ED study - period3); Sept.1-30,2013 (month following ED study-period4). During period1 and prior to adopting the cTnI assay, education (meetings, presentations, memos), was provided promoting the 3-6h ordering timeframe. We conducted a Kruskal-Willis all pairwise comparisons (Conover-Inman) to determine if there were significant changes in time between cTn measurements over the 4 time periods.

RESULTS: In period 1 (n=1070 patients with 2 cTnT measurements) the median time between tests was 6.84h. Following the assay change to cTnI (period 2), the median time between tests increased to 7.67h (n=970). In period 3, 6 months after introduction of cTnI and prior to ED study the, median interval time was 6.50h (n=920). In period 4 (the month following the ED study) the median interval was 5.75h (n=915). The differences in median interval time were significant ($p<0.05$) between all time periods except period 1 and period 3.

CONCLUSIONS: The introduction of a sensitive cTnI assay, even with clinical education provided, coincided with increased median interval between serial cTnI tests. Six months following introduction, the interval decreased and was similar to prior to the assay change. The month after the ED study, which forced the interval at 3h, time between cTnI sampling further decreased, suggesting the additional education and practical application provided through the ED study may have begun to change ordering practice.

Cardiovascular disease

Cod: 0395

THE RELATIONSHIP BETWEEN APELIN AND LIPID METABOLISM IN TYPE 2 DIABETIC CORONARY ARTERY PATIENTS

G. Saydam[3], M. Balk[3], F. Gündoğdu Erdem[3], E.D. Akbulut[3], H.Ç. Şimşek[3], A. Özkök[1], T. Ulus[2]
[1]*Türkiye Yüksek İhtisas Education and Reseach Hospital, Department of Anesthesiology and Reanimation, Ankara, Turkey*
[2]*Türkiye Yüksek İhtisas Education and Reseach Hospital, Department of Cardiovascular Surgery, Ankara, Turkey*
[3]*Türkiye Yüksek İhtisas Education and Reseach Hospital, Department of Clinical Biochemistry, Ankara, Turkey*

BACKGROUND: Apelin is an adipokine synthesized in the adipose and endothelial tissues. It is known that apelin secretion is regulated with insulin and related with obesity. Since Apelin expression is upregulated with insulin altered apelin concentrations in type 2 diabetic patients may be expected. Serum apelin concentration is suggested to be a marker of endothelial damage in type 2 diabetes. In this study, we aimed to investigate the relation among apelin, LDL-C and total cholesterol in diabetic patients with coronary artery disease.

METHODS: The study groups included A total of 35 patients with Type 2 diabetes mellitus to be applied to coronary artery bypass surgery (Group I) and 39 healthy individuals which control purposes from the hospital (Group II) were studied.Total cholesterol, high-density lipoprotein cholesterol, (HDL-C) triglyserid levels were measured by colorimetric enzymatic assay. Glucose was measured by uv test. Low-density lipoprotein cholestrol (LDL-C) was calculated by friedewald formula. Apelin was measured by competitive ELISA method. The relationship between variables was analyzed by pearson's RHO correlation. Differences and correlations were considered significant at $p < 0.05$.

RESULTS: In our study, we found a negative correlation between Apelin and LDL C levels in patient group r=-,354, p=0,037, in control group r=-,381, p=0,024 and in total participants r= -,285, p= 0,017. Also we found a negative correlation between total apelin and cholesterol in patient group r= -,336 and p=0,049. in control group r=-,196 p=0,258 in total participants r=-,262 and p=0,029. We didn' found between Apelin and trigliserit levels both of two groups.

CONCLUSIONS: In the study we observed a negative correlation between apelin and LDL-C in both patient and control groups. The increase in apelin levels due to the hyperinsulinism present in type 2 diabetes could be compansated with the downregulation of high LDL-C concentrations observed in coronary artery disease. In conclusion low apelin levels with concomitant high LDL-C observed in diabetic coronary artery disease patients may be an effect in the pathogenesis of coronary artery disease in these patients.

Cardiovascular disease

Cod: 0396

VERIFICATION OF THE AUTOMATED DETERMINATION OF ALDOSTERONE AND DIRECT RENIN

L. Stancik[1], M. Richter[1], J. Minar[1], M. Radina[1]
[1]*SPADIA LAB Inc., Clinical Laboratory, Ostrava, Czech Republic*

BACKGROUND: The possibility of rapid automated determination of aldosterone and renin levels and utilization of calculation of the ratio in a high-capacity laboratory was evaluated.

METHODS: The automated immunoanalytical system Diasorin Liaison XL using CLIA technology was used for determination of the direct renin and aldosterone. Measurements of direct renin and aldosterone were performed on a group of 270 patients diagnosed with primary (essential) hypertension. For further statistical analysis the group of 7 patients with renin below 0.5 ng / L was excluded. 151 women aged between 9-86 years and 112 men aged between 7-83 years were included in the evaluated group. Measurements were performed in plasma collected according to the protocol of Diasorin. The ratio of aldosterone / renin pmol/L / ng/L (ARR) was calculated. All patients were also assayed for potassium.

RESULTS: For men, there was among 88 entities with ARR value less than 100 (mean 26.7, median 16.2, SD of the mean 24.2), 14 patients were in the gray zone ARR 100-140 (mean 115.1, median 110.7 SD of the mean 12.6) and 10 patients had ARR above 140 (mean 249.5, median 229.8, SD of the mean 60.8). Hyperaldosteronism (more than 400 pmol/L) was found out in 14, 5, and 6 patients respectively. Regarding women there was among 117 subjects ARR value less than 100 (mean 30.8, median 21.9, SD of the mean 25.6), 8 patients were in the gray zone ARR 100-140 (mean 118.8, median 115.9, SD of the mean 10.5) and 26 patients had ARR above 140 (mean 311.2, median 184.9, SD of the mean 340.3). 19, 1 and 5 patients in the above mentioned groups were determined for hyperaldosteronism. All patients (263) were found normocalemic. The turnaround time (TAT) was in order of hours.

CONCLUSIONS: The system Liaison XL allows the fast estimation of aldosterone and direct renin, which rapidly shortens the laboratory turnaround time and seems a very useful tool for the differential diagnostics of the primary hypertension.

Cardiovascular disease

Cod: 0398

EFFECT OF MELATONIN ON SERUM TOTAL SIALIC ACID LEVELS IN EXPERIMENTAL MYOCARDIAL INFARCTION

E. Ozgun [2], G. Sayılan Ozgun[2], S. Eskiocak[2], U. Usta[3], N. Sut[1], S. Suer Gokmen[2]
[1]*Department of Biostatistics and Medical Informatics, Medical Faculty, Trakya University, Edirne*
[2]*Department of Clinical Biochemistry, Medical Faculty, Trakya University, Edirne*
[3]*Department of Pathology, Medical Faculty, Trakya University, Edirne*

BACKGROUND: It has been reported that serum total sialic acid levels are increased in patients with myocardial infarction and cell damage or excretion of sialic acid-rich acute phase proteins from the liver to circulation may be responsible for this increase. It is known that melatonin has the potential to prevent oxidative cell damage. The aim of this study was to investigate the effect of melatonin on serum total sialic acid levels in experimental myocardial infarction and to evaluate the role of oxidative stress in sialic acid elevation after infarction.

METHODS: Wistar albino male rats were divided randomly into following groups: control, melatonin, isoproterenol and isoproterenol+melatonin. Melatonin (10 mg/kg/day) solved in 4% ethanol was given intraperitoneally to melatonin and isoproterenol+melatonin groups for seven days. On the sixth and seventh days, isoproterenol (150 mg/kg/day) was given intraperitoneally to isoproterenol and isoproterenol+melatonin groups to induce myocardial infarction. One rat from each groups was randomly selected and kept alive to the fifteenth day for the pathologic examination of heart. Intracardiac blood was taken from other rats 24 hours after the last isoproterenol injection. Serum total sialic acid levels were determined by Warren method.

RESULTS: Histopathological examinations of the myocardial tissues of rats revealed that the changes confirming myocardial infarction in isoproterenol group are more prominent than those in isoproterenol+melatonin group. Isoproterenol administration caused a marked elevation in serum total sialic acid level. On the other hand, melatonin administration prevented sialic acid increase in isoproterenol group.

CONCLUSIONS: The present study showed that pre-treatment with melatonin to isoproterenol-treated rats significantly restores the levels of serum total sialic acid. The prevention of an increase in serum sialic acid levels by pretreatment with L-melatonin which has the potential to prevent oxidative cell damage is an important observation indicating that oxidative stress may also play an important role for an increase in serum sialic acid levels following myocardial infarction.

Cardiovascular disease

Cod: 0399

PATHFAST CTNI MEETS THE CRITERIA OF HIGH-SENSITIVITY TROPONIN ASSAYS

R. Thomae[3], E. Spanuth[2], E. Giannitsis[1]
[1]*Department of Internal Medicine III, Cardiology, University Hospital Heidelberg, Heidelberg, Germany*
[2]*DIAneering - Diagnostics Engineering & Research, Heidelberg, Germany*
[3]*Mitsubishi Chemical Europe, Düsseldorf, Germany*

BACKGROUND: The PATHFAST cTnI assay revealed an imprecision CV < 10% at the 99th percentile cutoff and has been classified as “guideline acceptable”. We assessed if the PATHFAST cTnI assay is comparable to hs cTnT and meets the criteria of high-sensitivity cTn assays.

METHODS: To check the 99th percentile cutoff-value and to determine an imprecision profile 117 healthy individuals without cardiac disorders were included. Additionally, PATHFAST cTnI and cobas® hs cTnT assay were measured in 193 consecutive patients admitted to the chest pain unit at presentation, 3 and 6 hours after admission. The results were related to the discharge diagnoses.

RESULTS: The cTnI determination of the healthy controls revealed a mean of 0.0021 (95% CI: 0.0016-0.0026) µg/L, 0.018 µg/L as highest value, and a 95th percentile of 0.0087 (95% CI: 0.0047-0.014) µg/L. Quantification of cTnI between 0.001 and 0.018 µg/L was possible in 49 samples. The imprecision profile according to NCCLS demonstrated 20%, 10% and 5% CVs at cTnI concentrations of 0.002, 0.003 and 0.02 µg/L, respectively. To evaluate the diagnostic validity for detection of NSTEMI the results of cobas® hs cTnT and PATHFAST cTnI were compared by ROC analysis. AUC values obtained from the ROC analysis using the manufacturer recommended 99th percentile cutoff values at admission, after 3 hours and after 6 hours were 0.926, 0.963 and 0.958 for hs cTnT and 0.910, 0.958 and 0.949 for cTnI, respectively. The corresponding AUC values of absolute changes of cTnI from admission to 3 hours and from admission to 6 hours were 0.920 and 0.931, respectively.

CONCLUSIONS: The PATHFAST cTnI met the criteria of high sensitivity cTn assays: CV < 10% at the 99th percentile, quantification of cTnI in healthy controls > 50%, and detection of absolute changes of cTnI (rise and/or fall) in NSTEMI patients. PATHFAST cTnI was comparable to hs cTnT for highly sensitive detection of NSTEMI with increasing sensitivity already at admission and after 3 hours, not going along with decreased specificity. The PATHFAST cTnI assay allows reliable determination of cTnI within 16 min from whole blood samples and might be useful at the point-of-care for early diagnosis of NSTEMI.

Cardiovascular disease

Cod: 0400

THE CUT-OFF VALUE OF ULTRASENSITIVE TROPONIN I FOR DIAGNOSIS OF ACUTE MYOCARDIAL INFARCTION

T. Esen[1], S. Kant[1], Y. Yazici[3], G. Kiris[2], U. Ucar[1]
[1]*Ahi Evren Chest, Heart and Vascular Surgery Hospital, Biochemistry Department, Trabzon, Turkey*
[2]*Ahi Evren Chest, Heart and Vascular Surgery Hospital, Cardiology Department, Trabzon, Turkey*
[3]*Ahi Evren Chest, Heart and Vascular Surgery Hospital, Microbiology Department, Trabzon, Turkey*

BACKGROUND: Cardiovascular disease, acute myocardial infarction which are the major health problems in humans. Cardiac troponins are important biomarkers for diagnosis of myocardial infarction because of their high sensitivity and specificity for myocardial injury. However according to the different measurement technics there are different cut-off values for Troponin I. We aimed to determine the cut off value of troponin I in our laboratory.

METHODS: We conducted a study to examine the diagnostic accuracy of sensitive cardiac troponin assays performed on blood samples obtained in the emergency department from 522 consecutive patients who presented with symptoms suggestive of acute myocardial infarction. Cardiac troponin levels were determined with the use of sensitive assays (Siemens Troponin I Ultra). The 86 of 522 patients were diagnosed as acute myocardial infarction according to the clinical features, ECG findings and cardiac markers were evaluated by cardiologists. We evaluated the clinical performance of ultrasensitive cardiac troponin I assay (cTnI) on the ADVIA Centaur system (TnI-Ultra). We intended to determine cut-off values of ultrasensitive cardiac troponin I according to clinical performance with ADVIA Centaur system.The cut-off values that show the optimum sensitivity and specificity were determined by Receiver Operator Characteristic analysis.

RESULTS: According to the Receiver Operator Characteristic analysis, 83.7 % sensitivity and 87.6 % specificity were found when we used 0.054 ng/mL as the cut-off value, as quantified by the area under the receiver-operating-characteristic curve (AUC) for troponin I 0.91 (95% confidence interval [CL], 0.88 to 0.93).When we used 0.04 ng/mL, 86 % sensitivity, 80.7% specificity were found and 80.2 % sensitivity, 87.8 % specificity were found for 0.06 ng/mL.

CONCLUSIONS: Troponin I cut-off value for acute myocardial infarction diagnosis was determined as 0.054 ng/mL in our laboratory. However, each laboratory needs to determine appropriate cut-off value for their patient population.

Cardiovascular disease

Cod: 0401

INSULIN RESISTANCE MARKERS, CRP AND IL-6 LEVELS IN MYOCARDIAL INFARCTION

O. Gruzdeva[1], E. Uchasova[1], E. Belik[1], Y. Dyleva[1], V. Karetnikova[1], O. Barbarash[1]
[1]*Research Institute for Complex Issues of Cardiovascular Diseases under the Siberian Branch of the Russian Academy of Medical Sciences, Kemerovo, Russia*

BACKGROUND: Insulin resistance (IR) is known to be a common feature of type 2 diabetes mellitus (T2DM) and is regarded as an important mechanism in the disease pathogenesis. One of the key pathogenetic mechanisms of IR progression is impaired free fatty acids (FFA) metabolism as well as plasminogen activator inhibitor - 1 (PAI-1) and key inflammation markers, i.e. interleukin-6 (IL-6) and C-reactive protein (CRP).

METHODS: The patients were divided into 2 groups: group 1 - 95 non-diabetic MI patients and group 2 - 40 diabetic MI patients. The control group consisted of 30 gender- and age-matched healthy subjects. Serum IL-6, CRP levels as well as FFA, glucose, C-peptide, insulin and plasma PAI-1 concentrations were measured at days 1 and 12 from MI onset. The study design was approved by the Institutional Review Board. The statistical analysis was performed using Statistica 6.1.

RESULTS: It was found that at day 1 there was an increase in glucose concentrations, which remained high in the both groups by day 12, but were much higher in the diabetic patients. Basal insulin and C-peptide levels did not differ significantly from those in the control group. The QUICKI index was significantly different from that in the controls in the both groups. FFA concentrations at day 1 both group 1 and group 2 patients increased, by day 12 they decreased but were still higher than those in the controls. CRP and IL-6 levels at day 1 were higher in all the patients but diabetic patients had the highest levels; by day 12 the levels were lower but still 2.4-fold (IL-6) and 12.5-fold (CRP) higher than those in the control group. The correlation analysis demonstrated the correlations between CRP and FFA (R=0.53 p=0.04 - group 1 and R=0.41 p=0.03 - group 2), CRP and PAI-1 (R=0.5 p=0.0027) CRP levels and postprandial levels glucose (R=0.48 p=0.045 - group 1, and R=0.51 p=0.041 - group 2) and basal levels glucose and IL-6 (R=0.48 p=0.031 - group 1, and R=0.51 p=0.023 - group 2).

CONCLUSIONS: MI as well as inflammatory response activation were found to be accompanied by IR irrespective of diabetic history. More informative indicators of IR in MI are increased concentrations of FFA and PAI-1 as compared to postprandial glycemia and insulinemia.

Cardiovascular disease

Cod: 0402

GROWTH ARREST-SPECIFIC 6 (GAS6) PROTEIN IN RELATION TO CONVENTIONAL CARDIOVASCULAR RISK FACTORS IN PATIENTS WITH PSORIASIS

F. Uras[4], M. Sunbul[2], Z. Cagman[4], F. Gerin[1], Z. Ozgen[3], E. Durmus[2], D. Seckin[3], M. Agirbasli[2]
[1]*Marmara University School of Medicine, Department of Biochemistry, Istanbul, Turkey*
[2]*Marmara University School of Medicine, Department of Cardiology, Istanbul, Turkey*
[3]*Marmara University School of Medicine, Department of Dermatology, Istanbul, Turkey*
[4]*Marmara University School of Pharmacy, Department of Biochemistry, Istanbul, Turkey*

BACKGROUND: An increased risk for cardiovascular (CV) disease with psoriasis has been documented in observational studies. Growth Arrest-Specific Gene 6 (GAS6) is a new vitamin K dependent protein. A number of in vitro studies have demonstrated that GAS6 is expressed in several human cells and tissues, such as endothelial and vascular smooth muscle cells. The aim of this study is to evaluate GAS6 levels along with conventional CV risk factors in patients with psoriasis.

METHODS: Forty patients with a diagnosis of psoriasis and 40 age-and-sex matched healthy controls were included in the study. In addition to GAS6 levels, patients and controls were evaluated for the presence of conventional CV risk factors. The human GAS6 sandwich ELISA development kit was used to measure GAS6 plasma levels.

RESULTS: Forty patients with psoriasis (22 male, mean age: 43.3±13.8 years) and 40 controls (22 male, mean age: 39.3±8.9 years) were included in the study. Patients with psoriasis had lower GAS6 levels when compared to control group without reaching statistical significance (6.6±2.0 ng/mL versus 7.6±2.8 ng/mL, p=0.071). On the other hand, psoriasis patients with smoking history had significantly lower GAS6 levels compared to patients without smoking history and controls (5.5±1.7 ng/mL, 6.9±1.9 ng/mL, and 7.6±2.8 ng/mL, respectively, p=0.044). Psoriasis patients with conventional CV risk factor (hypertension, hyperlipidemia, diabetes mellitus and cigarette smoking) had significantly lower GAS6 levels compared to psoriasis patients without any CV risk factor (5.7±1.7 ng/mL, 7.3±2.0 ng/mL, p=0.009). Correlation analysis revealed that the number of CV risk factors inversely correlated with GAS6 levels as (r= -0.335, p=0.034). Logistic regression analyses showed that GAS6 levels (Odds ratio: 1.65, 95% Confidence Interval: 0.21-5.64, p=0.017) was an independent predictor of presence of CV risk factors in psoriasis patients.

CONCLUSIONS: This pilot study showed that low serum levels of GAS6 might be a novel biomarker of CV risk in psoriasis patients.

Cardiovascular disease

Cod: 0403

RELATIONSHIP BETWEEN SERUM LIPO (A) AND PLASMA FIBRINOGEN LEVELS IN HEALTHY ADULT MEN

M.M. Uremis[1], E. Sahin[2], A. Celik[2], M. Kilinc[2], F. Inanc Tolun[2]
[1]*Sutcu Imam University, Institute of Health Sciences, Department of Medical Biochemistry*
[2]*Sutcu Imam University, Medical Faculty, Department of Medical Biochemistry*

BACKGROUND: The aim of this study was to investigate the relationship between plasma fibrinogen and serum lipo (a) levels which considered risc factors of Coronary Artery Disease (CAD) in healthy adult men.

METHODS: For this purpose, 37 healthy adult men have normal physical examination and laboratory findings and not use any drug were included to the study. Fasting serum lipo (a) and plasma fibrinogen levels were measured by autoanalyzer and commercial kits.

RESULTS: The mean of the age of the persons was 27,8; body mass index was 25,4; serum lipo (a) level was 0,19 and plasma fibrinogen level was 1,61. For statistical analysis Pearson's correlation test was applied. There was a significant positive correlation between the plasma fibrinogen and serum lipo (a) levels (r = 0,518 and p =0,001).

CONCLUSIONS: The plasma fibrinogen and the serum lipo (a) levels have been known as the risc factors for CAD increase together in healthy adult men. Similar findings have been reported in CAD patients. This relationship may be an evidence to increased risc of CAD may develop in the future.

Cardiovascular disease

Cod: 0404

THE EFFECT OF A SIX-MONTH RESISTANCE-TYPE EXERCISE TRAINING PROGRAM ON THE COURSE OF HIGH-SENSITIVE CARDIAC TROPONIN T LEVELS IN (PRE)FRAIL ELDERLY

N. van der Linden[1], M. Tieland[3], L.J. Klinkenberg[1], L.B. Verdijk[2], L.C. de Groot [3], L.J. van Loon[2], M.P. van Dieijen-Visser[1], S.J. Meex[1]

[1]*Department of Clinical Chemistry, Cardiovascular Research Institute (CARIM), Maastricht University Medical Center (MUMC), Maastricht, The Netherlands*

[2]*Department of Human Movement Sciences, School for Nutrition, Toxicology and Metabolism (NUTRIM), Maastricht University Medical Center (MUMC), Maastricht, The Netherlands*

[3]*Division of Human Nutrition, Wageningen University, Wageningen, The Netherlands*

BACKGROUND: With the introduction of high-sensitivity assays, basal serum cardiac troponin has emerged as a prognostic biomarker for cardiovascular risk. A previous, observational study showed that higher physical activity in elderly subjects was associated with both a lower basal cardiac troponin T (cTnT) and a lower probability of a significant increase of cTnT over time. However, a causal relationship has not been demonstrated. The present trial was conducted to investigate the hypothesis that a six-month resistance-type exercise training program can influence the basal serum cardiac troponin T levels in (pre)frail elderly, a group with high vulnerability to adverse cardiovascular outcomes and all-cause mortality.

METHODS: Sixty-two (pre)frail elderly subjects (≥65 years) participated in a 24-week supervised resistance-type exercise training program, or were followed up during a parallel non-interventional control period. Training was scheduled twice per week and workload was gradually increased during the study. Plasma cTnT was measured using the high-sensitive cTnT assay (Roche Diagnostics) at 0, 12 and 24 weeks of intervention.

RESULTS: All cTnT concentrations during the study (range 3.78–105.70ng/L) were above the detection limit (3ng/L), and 40 subjects (65%) had at least one measurement above the 99th percentile (14ng/L). Ten subjects withdrew from the study, leaving 52 subjects for follow-up analyses. Using mixed linear model analyses, no differences between the intervention and the control group on the course of cTnT levels during the six-month period were observed (intention-to-treat analysis p=0.38, per-protocol analysis p=0.16).

CONCLUSIONS: We found no effect of a six-month resistance-based exercise training program on the course of cardiac troponin levels in (pre)frail elderly. We can only speculate about the effects of more intensive and more prolonged interventions.

Cardiovascular disease

Cod: 0405

INVESTIGATION OF PROTEIN KINASE C GENE POLYMORPHISM IN PATIENTS WITH CORONARY ARTERY DISEASE

E. Zengin [2], B. Demir[2], D. Vardağlı[1], H. Sönmez[2]
[1]*Istanbul Esenyurt University Vocational School of Health Services - Medical Laboratory Techniques*
[2]*Istanbul University Faculty of Medicine in the Department of Biochemistry*

BACKGROUND: Atherosclerosis lays down for the foundation of the stroke and heart disease, in many countries. Proetine kİnase C (PKC),a family of serine/ thereonine kinases, has been identified as playing a role in many of the pathologies of heart disease.It is thought that PKC β I isozyme,plays a role in development of atherosclerotic plague by recruiting and migrating of monocytes to the arterial wall.Therefore,in our study,taking into account the number of obstructed vessels,PKC beta-1 gene polymorphisms were investigated patients with coronary artery in our community.

METHODS: In this study we evaluate totally 283 patients who were applied to Istanbul University Faculty of Medicine in the Department of Cardiology.Patients 40-70 years of age with vascular disease detected by coronary angiography (n=179) and healthy individuals who had no vascular disease detected by coronary angiography (n=104) were recruited.Genotype correlation with the risk of atherosclerosis was investigated by examining PKC beta gene polymorphism in 283 DNA samples.In our study,the polymerase chain reaction,restriction fragment length polymorphism techniques and agarose gel electrophoresis were used.The SPSS program was used for statistical analysis and $p<0.05$ was considered significant.Chi-square test was used for the evaluation of the incidence of genotype and allele differences between the groups.

RESULTS: In our study,allele-genotype frequencies of the control group and patients with atherosclerosis-allele genotype frequencies were compared.Changes in genotype distribution were examined in the presence of hypertension,diabetes and hyperlipidemia,gender,smoking,and depending on the number of clogged arteries.TT, TC, CC genotype frequencies in 283 patients were detected respectively, 38.9%, 49.8% and 11.3%. When compared statistically,there are currently no significant change in the distribution of PKC polymorphism ($p > 0.05$).

CONCLUSIONS: In our study,genotyping results,which didn't show any significant difference between patients and control groups,were compared with some clinical data of patients.Statistically,no significant correlation was found.These results indicate that further studies with larger groups are required to determine the polymorphism in PKC β gene.

Cardiovascular disease

Cod: 0406

PREDICTIVE ROLE OF ST2 FOR ALL-CAUSE MORTALITY IN ANTICOAGULATED PATIENTS WITH ATRIAL FIBRILLATION

J.A. Vílchez[4], M. Pérez-Cuellar[1], P. Gallego[5], S. Manzano-Fernandez[2], M. Valdés [2], V. Vicente[5], J. Ordoñez[1], J.A. Noguera-Velasco[4], G. Lip[3], F. Marín [2], V. Roldán[5]

[1]*Biomedical Research Institute, Santa Creu i Sant Pau Hospital, Barcelona, Spain*
[2]*Cardiology Department, University Clinical Virgen de la Arrixaca Hospital, Murcia, Spain*
[3]*City Hospital, University Department of Medicine, Birmingham, United Kingdom*
[4]*Clinical Analysis Department, University Clinical Virgen de la Arrixaca Hospital, Murcia, Spain*
[5]*Hematology Department, University General Hospital Morales Meseguer, Murcia, Spain*

BACKGROUND: Atrial fibrillation (AF) is associated with high morbidity and mortality. For assessing prognosis in AF, clinical risk scores are recommended for initiating oral anticoagulation (OAC) reduces the risk of stroke and death. However the risk of total and cardiovascular mortality remains high in this type of patients, even under OAC. It has been observed that rates of mortality, heart failure, myocardial infarction and stroke increase with older age and risk scores. Biomarkers may add significant information regarding mortality. ST2 is a member of the interleukin-1 receptor family. Patient's risk of mortality and morbidity increases with ST2 levels>30 ng/mL in patients with heart failure or acute coronary syndrome. We assessed the predictive value of ST2 levels in an unselected "real world" cohort of anticoagulated AF patients seen in everyday clinical practice.

METHODS: We studied 562 patients (49% male; median age 77 [IQR: 71-82]) with permanent AF who were stable (for at least 6 months) on OAC (INRs 2.0-3.0). ST2 levels were quantified by a quantitative sandwich monoclonal ELISA (Critical Diagnostics Presage® ST2 Assay). Patients were followed-up for up to 4 years, and adverse events of all cause mortality were recorded. A Cox regression analysis was performed using ST2 levels as a continuous variable.

RESULTS: Median (IQR) of ST2 levels were 51.23 (39.09-67.40) ng/mL. Median follow-up was 1587 days [IQR 1482-1617] days, and during this period, 91 patients died (3.72%/year). The c-statistic for ST2 was 0.58; p= 0.033. On multivariate analysis, age [1.09 (1.05-1.13); p<0.001], diabetes mellitus [1.76 (1.08-2.88); p= 0.023], previous stroke [2.16 (1.29-3.60); p= 0.003], and ST2 levels [1.008 (1.002-1.14); p= 0.008] were the variables which remained associated with mortality. Levels of ST2 were also significantly associated with the risk of mortality even after adjusting for the CHA2DS2–VASc score [HR: 1.007 (1.001-1.013); p= 0.014].

CONCLUSIONS: In a "real world" anticoagulated AF patient's cohort, ST2 levels are an independent predictive factor of all-cause mortality. ST2 levels could be a biomarker used to improve clinical risk assessment in anticoagulated AF patients.
Financial support: ISCIII and FEDER (P11/1256)

Cardiovascular disease

Cod: 0407

EVALUATION OF PROGNOSTIC VALUE OF HIGH-SENSITIVITY ASSAY FOR CARDIAC TROPONIN T IN PATIENTS WITH NORMAL CONVENTIONAL TROPONIN T AND SUSPECTED ACUTE CORONARY SYNDROME

C.M. Puche Morenilla[1], J.A. Vilchez Aguilera[1], D. Hernández Romero[1], I. Cebreiros López[1], T. Casas Pina[1], M. Martínez Villanueva[1], F. Marín Ortuño[1], J.A. Noguera Velasco[1]
[1]*University Hospital Virgen de la Arrixaca*

BACKGROUND: The availability of high-sensitivity troponin (hs-TnT) assay in emergency departments has afforded substantial improvement in the diagnosis and management of patients with non-ST-segment elevation acute coronary syndrome (ACS). Though some data suggested that a normal conventional troponin results implies excellent prognosis, other studies reported a few percent of myocardial infarction or death at 30 days. The aim of this study was to investigate the prognostic value of hs-TnT in patients with symptoms of chest discomfort suspected for coronary artery disease and normal conventional troponin values.

METHODS: A total of 154 patients with suspected ACS were included. The exclusion criteria were ST-segment deviation and conventional troponin elevation. These patients were managed by chest pain protocol that included careful history taking, physical examination, serial 12-lead ECGs and serum cardiac conventional troponin measurements. The primary end point was a composite of unstable angina, myocardial infarction or death of all causes at 22 months of follow-up. Serum levels of hs-TnT were assayed by a Cobas 6000 analyser (Roche Diagnostic, Mannheim, Germany).

RESULTS: During a median follow-up period of 22.5±8.1 months, 17 (11%) patients presented adverse clinical events: 1 cardiovascular death, 3 nonfatal MI and 13 unstable anginas. Kaplan-Meier curves showed that patients with raised hs-cTnT >14 ng/L had a significant worse outcome compared with patients with lower hs-cTnT at follow-up (log-rank test, p: 0.004). Moreover, by multivariable Cox regression analysis, the only significant factor that increased the risk of the primary end point was hs-cTnT > 14 ng/L [HR 2.38 (95% CI: 0.74-7.69), p: 0.046].

CONCLUSIONS: In patients presenting with acute chest pain and normal conventional troponin concentrations, hs-TnT measurement is a useful prognostic biomarker for prediction of unstable angina, myocardial infarction or mortality.

Cardiovascular disease

Cod: 0408

PROGNOSTIC IMPACT OF LABORATORY MARKERS ON IN HOSPITAL MORTALITY AMONG PATIENTS UNDERGOING PRIMARY PERCUTANEOUS CORONARY INTERVENTION

D. Vukosavljevic[1], N. Antonijevic[2], D. Matic[2], V. Stjepanovic[1], O. Gabric[1]
[1]*Center of Medical Biochemistry, Clinical Center of Serbia, Belgrade, Serbia*
[2]*Institute of Cardiovascular Diseases, Clinical Center of Serbia, Belgrade, Serbia*

BACKGROUND: Primary percutaneous coronary intervention (PCI) is the usual treatment of most patients presented with ST-elevation myocardial infarction (STEMI). The aim of this study was to determinate laboratory markers as the predictors of in hospital death in STEMI patients who underwent contemporary primary PCI.

METHODS: All consecutive STEMI patients (614) who underwent primary PCI between 01/2007 and 7/2009 were analyzed. Peak creatine kinase, elevated levels of white blood cells, glycemia, serum cholesterol and lower levels of hemoglobin at admission, were laboratory markers which were taken into consideration. The primary outcome was in hospital mortality.

RESULTS: Of 614 STEMI patients treated with primary PCI, in hospital death was recorded in 21 patients (3.4%). Patients who did not survive were older, more frequent were female gender, had previous coronary artery bypass grafting (CABG), previous PCI, lower baseline hemoglobin levels, elevated white blood cell count at admission and higher serum creatinine levels. Multivariate logistic regression analysis showed that laboratory markers which stand as independent predictors of in hospital death were lower hemoglobin levels (<130 g/l) on admission (OR 3.58, 95% CI 1.04-12.33, p=0.043) and elevated white blood cell count (≥14 000 per 1 mm^3) (OR 10.75, 95% CI 3.02-38.27, p<0.001), besides older age, previous myocardial infarction and previous CABG.

CONCLUSIONS: The independent predictors of in hospital death among laboratory markers in patients treated with primary PCI were baseline lower hemoglobin level and elevated white blood cell count at admission.

Cardiovascular disease

Cod: 0409

MICROCHIP-BASED LIPOPROTEIN ANALYSIS FOR ATHEROSCLEROTIC DISEASE RISK ASSESSMENT AND OBSERVATION OF THERAPEUTIC EFFECT

H. Wang[1], M. Guan[1]
[1]*Center of Laboratory Medicine & Center of Laboratory, Huashan Hospital, Shanghai Medical College, Fudan University*

BACKGROUND: Due to the mounting evidence of serum lipid changes in atherosclerosis (AS), there has been an increasing interest in developing new analytical methods of lipoprotein for diagnosis. In this study, we evaluated the ability of a new technique, microchip capillary electrophoresis (CE), to analysis the relation between serum lipoprotein levels and AS.

METHODS: The pre-stained serum samples with NBD C6-ceramide were separated in microchip with laser induced fluorescence detector. The specificity and saturation of NBD C6-ceramide as lipoprotein dyes were studied. The accuracy of the new method was estimated. The effect of storage of serum samples on electrophoresis behavior was evaluated. The lipid levels were investigated between the AS patients and healthy controls. The variations of lipoprotein of AS patients between prior treatment and post-treatment were assessed by microchip CE.

RESULTS: The assay was finished in 3 min and large, buoyant LDL (lLDL), small, dense low-density lipoproteins (sdLDL), very low-density lipoproteins (VLDL) and high-density lipoprotein (HDL) were effectively separated. NBD C6-ceramide was identified as a good compromise for specific labeling and quantitation of serum lipoprotein. A high correlation was observed between microchip CE and ultracentrifugation for sdLDL ($r = 0.91$). The linear ranges of lLDL, sdLDL, VLDL and HDL were 10 - 800, 10 - 800, 40 - 1000 and 20 - 800 μg L-1, and their limits of detection were 5, 5, 15 and 8 μg L-1, respectively. The intraassay and interassay relative standard deviation of lipoprotein peak areas were in the range of 3.8-7.4%. The storage of a serum sample under -80°C for 6 months does not affect lipoproteins analysis. Compared with controls, patients had significantly higher levels of sdLDL ($P < 0.001$) and VLDL ($P < 0.001$). Compared with prior treatment, patients had significantly lower levels of sdLDL ($P < 0.001$) and VLDL ($P < 0.001$) and significantly higher levels of HDL ($P < 0.01$).

CONCLUSIONS: The method has the potential for rapid and sensitive detection of lipoprotein classes as well as their subclasses. Microchip-based lipoprotein assay will improve the analysis of risk factors in AS and provides useful information for the observation of therapeutic effect on atherosclerotic disease.

Cardiovascular disease

Cod: 0410

SOLUBLE UROKINASE PLASMINOGEN ACTIVATOR RECEPTOR AS AN ADVERSE CARDIAC EVENTS PREDICTOR IN SHORT-TIME PROGNOSIS AFTER FIRST ACUTE MYOCARDIAL INFARCTION IN PATIENTS TREATED WITH PRIMARY CORONARY INTERVENTION

R.N. Wlazel[3], I. Szadkowska[2], M. Zielinska[1], L. Pawlicki[2], M. Paradowski[3]
[1]*Department of Intensive Cardiac Therapy, Medical University of Lodz*
[2]*Department of Internal Diseases and Cardiological Rehabilitation, Medical University of Lodz*
[3]*Department of Laboratory Diagnostics and Clinical Biochemistry, Medical University of Lodz*

BACKGROUND: Soluble urokinase plasminogen activator receptor (suPAR) is an independent predictor of adverse outcomes of cardiovascular disease and mortality in general population. The aim of the study was to assess the short-time risk connected with cardiovascular events in patients after first acute myocardial infarction (AMI). The serum level of suPAR was assessed as a biomarker of risk and compared to the inflammatory marker C-reactive protein (CRP). Moreover correlation between suPAR level and left ventricular systolic function as well as AMI type was assessed.

METHODS: We enrolled 127 patients with first AMI, without prior heart failure. Primary PCI procedure was applied as a treatment. In all patients following serum level parameters' were measured before discharge: suPAR (ELISA, Virogates); hsCRP (ITA, AU680 Beckman Coulter); hsTnT (ECLIA, Cobas e411, Roche). Additionally hsCRP was measured on admission to exclude influence of an acute inflammation process due to treatment procedures. Troponin T was measured on admission and during each following 6-hour period to determine the highest troponin level. As a major adverse cardiac event (MACE) in the 1 year follow-up study we defined non-fatal AMI, stroke, coronary revascularization and death.

RESULTS: Logistic Regression analysis indicated correlation between the suPAR discharge level and the probability of developing MACE during the 1 year time period, OR=1.48; 95% CI= 1.12-1.95; p=0.003. The ROC analysis indicated 89% sensitivity and 30% specificity for predicting cardiovascular events (cutoff 3.5 ng/mL, AUC 0.62, p=0.02). There was no difference in ROC analysis for hsCRP measured on admission and at discharge (AUC 0.61 and 0.58 respectively, p=0.7), however suPAR levels showed correlation only with discharge hsCRP levels (r=0.35, p<0.05). There was no correlation between suPAR and EF, WMSI, as well as maximum TnT or AMI type.

CONCLUSIONS: The results show that suPAR level may be a useful indicator also for short-term prediction for cardiovascular events after the first AMI, independently of hsCRP. Lack of correlation between suPAR level and left ventricular systolic function parameters as well as parameters associated with AMI may confirm suPAR has more prognostic than diagnostic power.

Cardiovascular disease

Cod: 0411

ASSOCIATION BETWEEN SERUM PENTRAXIN LEVELS AND CORONARY ARTERY PLAQUE MORPHOLOGY IN PATIENTS WITH UNSTABLE ANGINA PECTORIS

S. Yiğit[1], Y. Erdogan Doventas[1], M. Koldas[1], S. SARİ[1], A. Arat Özkan[2]
[1]*Department of Biochemistry, Haseki Training and Research Hospital, Istanbul, Turkey*
[2]*Department of Cardiology, Istanbul University Cardiology Institute, Istanbul, Turkey*

BACKGROUND: In prior investigations associated with atherosclerosis, it was acknowledged as a disease only related with metabolic and enviromental factors such as genetics, irregular lipid profile (high LDL levels), hypertension, smoking. However latter studies demonstrate that inflamation has a key role in the whole atherosclerotic process; onset and progression. One of the atherosclerosis spesific inflamatuar indicator is pentraxin 3 which is synthesised from cells such as endotel, macrophages, smooth muscle cells of the atherosclerotic origin. PTX-3 is one of the member of pentraxin family such as hs-CRP and a component of the natural immunity. In our study, we observe serum PTX-3, hs-CRP and other coronary artery risk factors, in patients who had the “stabile angina pectoris” diagnosis supported by the gensini score of coronary obstruction degree.

METHODS: Our patients was consisted of 88 individuals who approached Cardiology Institute of İstanbul University and diagnosed as “stabile angina pectoris” by coronary angiography. Biochemical parameters were observed in the biochemistry laboratory of Haseki Education and Research Hospital. Serum PTX-3 was analysed by ELISA kit related with sandwich method. Hs-CRP was analysed by Siemens Advia 2400 using turbidimetric method, in mg/dl.

RESULTS: 1. Group (patients with mild coronary diseases and/or gensini score <50) was compared with 2. group (1,2 and 3 vessels affected patients and/or gensini score over 50). Comparing these two groups laboratory parameteres’ median levels show no statistically significant difference. Hs-CRP median values were higher than the first group but this was not statistically significant ($p = 0.065$). However PTX- 3 results were much more higher in the severe coronary disease patients (group 2) and was statistically quite significant ($p<0.001$).

CONCLUSIONS: İn our study, we demonstrated that in patients with stabile angina pectoris, high plasma PTX-3 levels were related with coronary atherosclerosis. İn patients with stabil angina pectoris , before coronary angiography observing plasma PTX-3 levels may suggest severity of the disease and this may lead to make decision of angiography.

Cardiovascular disease

Cod: 0412

INFLAMMATORY MARKERS AND VITAMIN D DEFICIENCY IN ACUTE CORONARY SYNDROME: DIFFERENCE IN ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION AND IN UNSTABLE ANGINA PECTORIS

E. Yilmaz[2], H. Ellidag[1], A. Yilmaz[1], O. Aydın[1], Y. Necat[1]
[1]*Antalya Education and Research Hospital*
[2]*Ataturk Hospital, Antalya*

BACKGROUND: Over the last few years a considerable amount of papers has focused on the role of inflammation in the pathogenesis of acute coronary syndrome (ACS). A modern concept considers ACS as an auto-inflammatory disorder. The present study aims to assess the plasma levels of inflammation related biomarkers and cytokines in ACS patients and to correlate the values with 25-hydroxy vitamin D3 (calcidiol) levels.

METHODS: We composed two groups: patients with ST-elevation myocardial infarction (STEMI) and patients with unstable angina pectoris (USAP). Eighty-eight patients with ACS (n=47 STEMI, age 58±14 years; n=41 USAP, age 63±10 years) were enrolled. Blood samples were collected at admission, to evaluate calcidiol, serum amyloid A (SAA), interleukin (IL)-6, IL-10, tumor necrosis factor-alpha (TNF-α) and high sensitivity C-reactive protein(hs-CRP).

RESULTS: TNFα and SAA levels were significantly lower in STEMI patients than USAP patients (p=0.005 and p=0.003 respectively), whereas hsCRP were found to be significantly higher(p=0.002). STEMI patients were more likely to have calcidiol deficiency compared to USAP patients (p=0.01). There was no relationship between inflammatory markers and calcidiol levels. In the STEMI group, there were negative correlations between Amyloid A and hsCRP (p = 0.01); Amyloid A and IL-6 (p = 0.01); a strong positive correlation between IL-6 and hsCRP (p=0,0003). In the USAP group, there was a strong negative correlation between Amyloid A and hsCRP (p<0.0001) and a positive correlation between IL-6 and TNF-α (p<0.0006) .

CONCLUSIONS: This study demonstrates - to our knowledge for the first time – that level of calcidiol is not associated with the inflammation markers of patients presenting with ACS. We also confirm a high prevalence of calcidiol deficiency in these patients within the 12 hours of onset symptoms of ACS.

Cardiovascular disease

Cod: 0413

CORRELATION BETWEEN PROINFLAMMATORY CYTOKINES AND CARDIOVASCULAR RISK FACTORS IN TUNISIAN CORONARY ARTERY DISEASE PATIENTS

A. Zied[4], E.O. Mabrouka[1], G. Ezzedine[3], H. Habib[2], M. Chakib[1]
[1]*Biochemistry Department, Military Hospital of Tunis, Tunisia*
[2]*Cardiology Department, Military Hospital of Tunis, Tunisia*
[3]*Immunology Department, Military Hospital of Tunis, Tunisia*
[4]*Military Hospital of Tunisia*

BACKGROUND: Inflammatory markers play a key role in the pathogenesis of atherosclerosis. The entire inflammatory process occurs due to the synergistic pathogenic processes of inflammation, dyslipidemia, immune activation and thrombosis. The purpose of this study was to determine the relationship between some inflammatory cytokines, classic and novel cardiac risk factors in a heart failure Tunisian group.

METHODS: Patients with acute coronary syndrome (ACS) (122) were recruited from the cardiac intensive care unit of the Military Hospital of Tunis, Tunisia. Inflammatory markers as high sensitive C reactive protein (HsCRP) and homocysteine (Hcy) and proinflammatory cytokines as interleukins (IL) IL6, IL8, IL1β and tumor necrosis factor (TNFα) were determined for all participants.

RESULTS: We found elevated levels of IL6, TNFα, HsCRP and THcy according to reference values. Hyperhomocysteinemic patients had significantly elevated levels of TNFα ($p<10^{-3}$) and HsCRP (p=0,024) compared to those with normal Hcy concentrations. Patients with total cholesterol TC ≥ 5,2 mmol/l represent significantly elevated TNFα (p=0,003), IL1β (p=0,005), IL6 (p=0,047). TNFα, IL6 and IL1β were significantly correlated to TC (r=0,32; $p<10^{-3}$, r=0,23; p=0,01, r=0,22; p=0,01 respectively).

CONCLUSIONS: Cytokines can be considered predictors of pathology in patients with cardiovascular disease and that interaction with new risk factors as Hcy and HsCRP can improve the diagnosis and the classification of patients at admission.
Key words: Proinflammatory cytokines, Hcy, lipid profile, acute coronary syndrom