new equation CKD-EPI with MDRD 4 in a wide cohort of hospitalized patients (14,658 adults) and to analyze the impact of the new CKD-EPI formula on the satging of patients with CKD.

Results: The concordance correlation coefficient beetween both formulas was 0.9949 (95% CI: 0.9947 to 0.9951). The distribution of KDOQI stages were: CKD-EPI (1 + 2, 69.9%; 3a, 14.9%; 3b, 9.4%; 4, 4.3%; 5, 1.5%),MDRD (1 + 2, 72.7%; 3a, 14.9%; 3b, 7.7%; 4, 3.4%; 5, 1.2%). Weighted Kappa statistics was 0.861 (very good agreement). Overall, CKD-EPI detected an additional 2.8% of patients with GFR < 60 mL/min/1.73m^2.

Conclusions: CKD-EPI equation reclasified an additional 2.8% of patients to stages of worse GFR

P13 - Lung, liver and gastrointestinal diseases

P13-01

Serum copper concentrations and cardiomyopathy in cystic fibrosis patients

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Background: Copper deficiency has been reported in cardiomyopathy and may occur in patients with intestinal malabsorption, as occurs in cystic fibrosis (CF). The aim of this multicenter study is to evaluate copper in CF patients, who have a high prevalence of cardiomyopathy.

Materials and methods: We studied 123 adult CF patients (63 male and 60 female) with a mean age of 31 (SD: 8.90). Serum copper concentrations were measured using flame atomic absorption spectrometry. The concentration of serum ceruloplasmine was measured by immunonephelometry. In addition, we estimated the Cu/Ceruloplasmine ratio. The left ventricular ejection fraction (LVEF) was determined by a Philips IE33 Echocardiogram. We defined systolic dysfunction as an LVEF less than 55% (Simpson's method).

Results: The mean copper concentration was 131.8 µg/dL (SD: 37.7). The mean serum ceruloplasmine was 34.00 mg/dL (SD: 9.1). The mean Cu/Ceruloplasmine ratio was 3.9 (SD: 0.4). No correlation was found between total copper and LVEF or between the Cu/ceruloplasmine ratio and LVEF. However, upon considering patients with an LVEF under the cutoff of 55 % we found a lower serum copper concentration (117.8 µg/dL SD:18.4 *vs*. 132.6 µg/dL SD: 38.3), although this difference was not statistically significant.

Conclusion: In spite of the malabsorption associated with CF, we did not observe copper deficiency in this population. Since we found a decrease in copper concentrations in patients with lower LVEF, more studies should be performed with a greater sample size in order to clarify the role that copper may play in the cardiomyopathy of CF patients.

P13-02

Lead and cadmium in cystic fibrosis

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Background: Exposure to lead and cadmium is a public health problem due to the broad exposure to these toxic substances among the general population, and in recent years they have been associated with an increased cardiovascular risk. The objective of this multicenter study is to determine blood lead and cadmium concentrations in a population of unselected patients diagnosed with

cystic fibrosis (CF), who have a higher prevalence of cardiomyopathy than expected.

Material and methods: We studied 123 adult CF patients (63 male and 60 female) with a mean age of 31 (SD: 8.90). The blood lead (µg/dL) and cadmium (µg/L) concentrations were measured by electrothermal atomic absorption spectrometry with Zeeman background correction in a Perkin-Elmer spectrometer. The left ventricular ejection fraction (LVEF) was determined by a Philips IE33 echocardiogram. We defined systolic dysfunction as an LVEF less than 55% (Simpson's method).

Results: The median of lead was 0.80 µg/dL (IQR: 0.48-1.13). Blood lead percentiles (5, 25, 50, 75, 95) were: 0.07, 0.48, 0.80, 1.13, 1.91 µg/dL respectively. Eighty per cent of the patients had blood cadmium concentrations below the detection limit (0. 07 µg/L). Blood cadmium percentiles (75, 90, 95) were: 0.07, 0.3, 0.7 µg/L. No significant differences were found between lead and cadmium levels and LVEF.

Conclusion: The concentrations of blood lead in this population are low and similar to the reference values for this age group in Spain. Most of these patients showed blood cadmium levels below the detection limit probably because of their low level of smoking.

13-03

Interaction of blood mercury with essential trace elements in a cystic fibrosis population

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Background: Exposure to mercury is a public health issue. Cystic fibrosis is characterized by an obstructive pulmonary pattern and a pancreatic exocrine deficiency, frequently associated with malabsorption. We studied the relationship between mercury, copper, zinc and selenium in this multicenter population.

Materials and methods: We studied 123 adult CF patients (63 male and 60 female) with a mean age of 31 (SD: 8.90). Serum copper (µg/dL) and zinc (µg/dL) were measured using flame atomic absorption spectrometry. Serum selenium (µg/L) was measured using electrothermal atomic absorption spectrometry. Blood mercury (µg/L) was measured by atomic absorption spectrometry and thermal decomposition amalgamation.

Results: The median of blood mercury was 5.7 µg/L (IQR: 2.9-9.6). Forty eight per cent of the patients had blood mercury levels higher than the levels established by the EPA (5.8 µg/L). The mean of serum copper was 131.8 µg/dL (SD: 37.7). The mean of serum zinc was 86.9 µg/dL (SD: 13.3) and for selenium was 71.9 µg/L (SD: 14.8). A negative correlation was found between mercury and zinc ($r = -0.125$) which was not statistically significant; no correlation was observed between mercury and copper. A positive correlation was found between mercury and selenium ($r = 0.308$, $P < 0.001$). This correlation was observed in both patients with blood mercury levels under 5.8 µg/L ($r = 0.304$, $P = 0.012$) and in those with levels above 5.8 µg/L ($r = 0.333$, $P = 0.007$).

Conclusion: We found high mercury levels in patients with CF. Further studies are desirable to investigate the interactions with essential trace elements and different compounds of the diet which could prevent mercury toxicity.

P13-04

Selenium and mercury and the left ventricular ejection fraction in adult cystic fibrosis patients

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Background: Cystic fibrosis (CF) is frequently associated with malabsorption. Certain studies have described a rare form of cardiomyopathy (CMP), similar to the one seen in Keshan's disease. The aim of this multicenter study is to measure serum selenium and blood mercury and their relation with cardiomyopathy in CF patients.

Materials and methods: We studied 123 adult CF patients (63 male and 60 female) with a mean age of 31 (SD: 8.90). Blood mercury concentration (µg/L) was measured by atomic absorption spectrometry and thermal decomposition amalgamation. Serum selenium concentration (µg/L) was measured by electrothermal atomic absorption spectrometry. The Left Ventricular Ejection Fraction (LVEF) was determined by echocardiography. We defined systolic dysfunction as an LVEF of less than 55% (Simpson's method).

Results: The patients with serum selenium concentrations below 60 µg/L had a lower mean LVEF (58.86% SD: 12.10) than the ones with serum selenium concentration above 60 µg/L (65.21% SD: 6.23) and this difference was statistically significant (P = 0.001). The difference between these means (B = 6.36; P < 0.001 CI 95%: 2.76-9.95) can be explained in 9.4% by selenium (R^2 = 0.094; P < 0.001) and 9.8% can be explained by the selenium/mercury ratio (R^2 = 0.098; P < 0.002). However, once adjusted for mercury this last difference can be explained only by selenium (B = 6.45; P = 0.001 CI 95%: 2.58-10.33). No significant differences were found between mean LVEF and blood mercury levels (cutoff of 5.8 µg/L) and the selenium/mercury ratio (cutoff of 10.34).

Conclusion: Studying the association between mercury, selenium and LVEF, we observed that only low selenium concentrations are related to alterations in LVEF.

P13-05

Monitoring faecal occult blood test positivity in the NHS Bowel Cancer Screening Programme

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Background: The guaiac-based faecal occult blood test kit used by the NHS Bowel Cancer Screening Programme (BCSP) relies on subjective visual assessment to determine positivity. BCSP participants apply two samples from three separate bowel motions to each of six test kit windows lined with filter paper impregnated with guaiac. Test kits are returned to the Hub for analysis where development of an unstable blue-green colour in response to a peroxide developer indicates the presence of haemoglobin. Individuals who test positive are referred for further investigation, usually colonoscopy. The subjective nature of the test kit reading and possible inaccuracies have consequences for the national programme, participants and colonoscopy services.

Materials and methods: Test kit readers are tested for colour blindness and visual acuity when they start work in the Hub. The percentage of positive test spots is recorded weekly for readers completing > 100 kits. The acceptable spot positivity range (1-4%) is based on an approximation of ± 2 standard deviations from the rolling six-month mean percentage positivity for all Hub staff.

Results: Since monitoring began in 2010 there has been a reduction in reader imprecision and outliers. New staff attend training sessions to learn about

the concept of reader positivity and the interventions that may be put in place if their positivity falls outside the acceptable range and supervised refresher training for all staff is conducted annually.

Conclusion: Monitoring of test kit readers' performance is essential whilst adoption of an automated immunochemical test analysis is the long-term solution.

P13-06

The NHS Bowel Cancer Screening Programme, Southern Hub – screening activity and outcomes

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Background: The NHS Bowel Cancer Screening Programme (BCSP) in England invites individuals aged 60-74 years to be screened every two years. The BCSP Southern Hub serves a population of about 14.4 million people and manages the screening activity in the south of England. Invitees are sent a guaiac-based faecal occult blood (gFOB) test kit, asked to provide a faecal sample and to return the test kit to the Hub for analysis. Participants with a positive ('abnormal') test are referred to a Specialist Screening Practitioner (SSP) for further investigation, usually colonoscopy.

Materials and methods: All screening activity, including uptake, gFOB test results, SSP referrals and colonoscopy outcomes are stored on the Bowel Cancer Screening System. Data for the period 2006-2011 were extracted and analysed.

Results: The uptake of screening invitations (the proportion of invitees that is adequately screened) is approximately 56% overall (higher for women than men [61% *vs*. 55%]). The proportion of positive test kits is higher for men than women (2.6% *vs*. 1.6%) and positivity has increased over time, with a consequent increase in the number of colonoscopies performed. About 40% of the screened population that undergoes colonoscopy has significant neoplasia (cancer, high- or intermediate-risk adenomas). The prevalence of significant neoplasia is greater in men and increases with age. The proportion of significant neoplasia detected in screening episode 2 is lower than in episode 1.

Conclusion: The screening data are encouraging and indicate that the BCSP in England is likely to achieve its goal of reducing bowel cancer mortality.

P13-07

Comparative study of the risk of developing NAFLD in individuals without liver disease

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Introduction: Nonalcoholic fatty liver disease (NAFLD) has been recognized as the most common liver disease in Western countries, since its prevalence is high (20-30%) in developed countries. The objective of our work is a comparative study of biochemical parameters (glucose, cholesterol, HDL-cholesterol, LDL-cholesterol, triglycerides, AST and ALT) between individuals with NAFLD and others without NAFLD.

Materials and methods: Control group includes 47 subjects without NAFLD (25 females and 13 males) and other group with 11 subjects (2 females and 9 males) diagnosed with NAFLD by liver biopsy or ultrasound. After blood collection, the biochemical parameters were assessed on the equipment TARGA3000®.

Results: Significant differences were found between both groups on: triglycerides, AST and ALT. Aminotransferases are the variables that showed a more marked difference, AST and ALT values were elevated in 100% and 72,7%, respectively, of the subjects with NAFLD. One subject from control

group had higher values of aminotransferases then the average of subjects with NAFLD.

Conclusion: These results enlighten the need for surveying and monitoring apparently healthy population in order to be effective in primary prevention of NAFLD and other metabolic disorders.

P13-08

Citrulline – marker of enterocytes mass and function in patients after stem cells transplantation

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Background: Citrulline is an amino acid produced by enterocytes. Plasma citrulline concentration is considered as a marker of enterocytes mass and function. The determination of citrulline could be helpful in patients with intestinal failure, intestinal diseases (celiac and Crohn disease, etc.) or intestinal damage caused by toxicity of chemotherapy or graft-versus-host disease (GvHD).

Materials and methods: We measured plasma citrulline levels in 12 patients (20 patient´s samples) with diarrhea after allogeneic stem cell transplantation and in 20 healthy controls.

Results: The median value of citrulline levels was significantly lower in the transplanted patients group compared to healthy controls: 10.2 (0.6–63.8) *vs*. 33.3 (19.1–45.9) µmol/L, $P < 0.001$. The median values of citrulline levels in patients with post-transplant toxic intestinal damage (mucositis) (N = 8, day 1–22 post-transplant) *vs*. GvHD (N = 7, day 43-142) *vs*. "others" (usually dysmicrobia, N = 5, day 120-570) were: 9.6 (0.6–18.6) *vs*. 3.4 (1.9–9.9) *vs*. 19.5 (15.3–63.8) µmol/L.

Conclusions: The citrulline levels were significantly lower in patients compared to the control group. Low citrulline levels were found in patients shortly after stem cell transplantation and in patients with GvHD. Observations in larger groups of patients are necessary. Supported by specific fund SVV 262 806 and by the project Ministry of Health, Czech Republic for conceptual development of research organization 00669806 - Faculty Hospital in Pilsen, Czech Republic

P13-09

Prevalence of AMHA and ANA in patients with suspicious primary biliary cirrhosis

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Primary biliary cirrhosis (PBC) is characterized by the presence of disease-specific autoantibodies that are primarily directed against mitochondrial antigens (AMA). However, a subgroup of patients' sera is also positive for antibodies to nuclear autoantigens (ANA). PBC-specific antinuclear antibodies are of diagnostic and clinical relevance since they can be used as a „positivie tool"in the diagnosis of AMA-negative PBC while at the same time identifying of patients with more advanced liver disease. Because both AMA and ANA testing are a critical part of diagnosis in PBC, it is important to detect them very carefully. Indirect immunofluorescences (IIF) on frozen sections of rat kidney and stomach, human epithelial HEp-2 cells and immunoblot to different target antigens have been used for this purpose. The aim of our study was to determine prevalence of PBC-specific ANA and their target antigens in 210 patients with suspicious PBC. AMA were positive in 91.9% (193/210) and PBC-specific ANA in 8.1% (17/210) of sera. Both AMA and ANA were found in 35.2% (74/210) of patients sera. AMA positive sera

recognized specific target autoantigens M2 and ANA specific autoantigens: Sp100 (57.1%; 52/91), PML (52.7%; 48/91) and gp210 (41.7; 38/91). Futhemore, they recognized the Ro-52 autoantigen (33.3%; 70/210). Sera that were ANA positive in the IIF recognized only nuclear specific autoantigens Sp100, PML and gp210. Our results show the compatibility of IIF and immunoblot in detecting AMA and ANA, and that IIF on HEp-2 cells and frozen sections of rat kidney and stomach detects PBC-specific ANA.

P13-10

Comparison of fecal calprotectin and CRP in pediatric inflammatory bowel disease

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Background: The aim of the study was to evaluate the diagnostic accuracy of C-reactive protein (CRP) and fecal calprotectin (FC) as markers of inflammatory bowel disease (IBD) in pediatric patients.

Materials and methods: The study included 66 pediatrics patients; 41 patients with IBD (confirmed by colonoscopy as the gold standard) and 25 patients with excluded IBD (non-IBD). The serum concentrations of CRP were measured by an immunoturbidimetric high sensitive latex CRP assay (Beckman Coulter, AU 400 analyzer). The concentrations of FC were measured with commercially available enzyme-linked immunosorbent assay (Calprest, Eurospital).

Results: The medians (95% confidence interval (95%CI); interquartile range (IQR)) of both markers were significantly higher (P < 0.001) in IBD pediatric patients: CRP 8.7 mg/L (4.4-16.0; 2.7-20.6) and FC 368.0 µg/g (234.0-457.0; 215.8-559.0) compared with non-IBD patients (CRP 0.3 mg/L; (0.2-0.6; 0.2-0.7) and FC 15.6 µg/g (15.6-17.0; 15.6-20.8). However, the receiver operating characteristic (ROC) analysis showed significantly higher diagnostic accuracy (P = 0.039) of FC (area under curve (AUC) of 0.977; 95%CI = 0.905-0.998, sensitivity (Se) of 90.2%; 95%CI = 76.9-97.3, specificity (Sp) of 100%; 95%CI = 86.3-100.0, likelihood ratios LR- 0.09 and LR+ 22.6 at optimal cut-off value of 56 µg/g) compared with those of CRP (AUC = 0.903; 95%CI = 0.805-0.962, Se = 75.6% (95%CI = 59.7-87.6), Sp = 96.0% (95%CI = 79.6-99.9), LR- 0.25 and LR+ 18.9 at optimal cut off value of 2.6 mg/L).

Conclusion: Although both markers, CRP and fecal calprotectin, can be used for estimating mucosal inflammation in pediatric IBD patients, FC showed a higher diagnostic accuracy in discriminating between IBD and non-IBD pediatric patients with better sensitivity, specificity and likelihood ratios.

P13-11

Lipid profile in patients with chronic obstructive pulmonary disease

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Background: Chronic obstructive pulmonary disease (COPD) is a complex systemic disease associated with many comorbidities. Cardiovascular diseases (CVD) are the leading cause of death among patients with COPD. Our aim was to assess the lipid profile and the relationship between lipid and lung function parameters in COPD patients.

Materials and methods: The study included 38 healthy subjects (15 smokers, 10 ex-smokers, 13 non-smokers) and 103 COPD patients (31 smokers, 25 ex-smokers, 47 non-smokers). COPD patients were also subdivided according to disease severity (GOLD stages II-IV). FEV1 predicted and FEV1/FVC were determined by spirometry. Total cholesterol, triglycerides, HDL cholesterol, ApoA and ApoB were measured in sera of all participants, while LDL cholesterol and LDL/HDL and ApoB/ApoA ratios were calculated.

Results: Total cholesterol, triglycerides, LDL cholesterol and ApoA were lower, and ApoB/ApoA ratio was higher in patients with COPD ($P = 0.003$, $P < 0.001$, $P = 0.043$, $P < 0.001$, $P = 0.005$, respectively). No differences were found in HDL cholesterol and ApoB concentrations and LDL/HDL ratio when comparing patients with healthy subjects. However, HDL was weakly negatively correlated with FEV1/FVC in the patient group ($r = -0.27$, $P = 0.006$). In addition, neither disease severity nor smoking status influenced lipid parameters in COPD patients.

Conclusions: Although COPD is associated with an increased risk of CVD, our results do not confirm a pro-atherogenic lipid pattern in these patients. However, further research including a larger number of participants is needed to clarify this dilemma.

P13-12

MMP-9 and TIMP-1 concentrations in plasma of patients with chronic obstructive pulmonary disease

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Background: An imbalance of matrix metalloproteinases (MMPs) and tissue inhibitors of matrix metalloproteinases (TIMPs) has been implicated in the pathogenesis of chronic obstructive pulmonary disease (COPD). The aim of this study was to evaluate MMP-9 and TIMP-1 concentrations in COPD patients in relation to the severity of disease.

Materials and methods: The study included patients with stable COPD ($N = 59$) and healthy volunteers ($N = 21$). COPD patients were divided into subgroups (GOLD stages II to IV) according to the spirometry results. Plasma MMP-9 and TIMP-1 concentrations were determined using a commercially available ELISA kits. Classic inflammatory markers were also measured (differential leukocyte counts and CRP).

Results: MMP-9 concentration in COPD patients (204.13 (115.70-351.24) ng/mL) was significantly increased comparing to healthy controls (70.25 (52.48-104.96) ng/mL) with $P < 0.001$. There were no significant differences in TIMP-1 concentration. MMP-9/TIMP-1 ratio differed significantly between COPD patients (1.659 (0.965-2.687)) and healthy controls (0.627 (0.424-0.890)) with $P < 0.001$. Similar pattern was found already in GOLD II stage of disease. Very good diagnostic accuracy for MMP-9 was determined (AUC = 0.884; sensitivity of 66.1% and specificity of 100.0%; $P < 0.001$). The multivariate logistic regression model showed that the use of MMP-9 in combination with neutrophils, lymphocytes and CRP improved significantly ($P = 0.023$) diagnostic strength (AUC = 0.975).

Conclusions: Increased concentration of MPP-9 and higher MMP-9/TIMP-1 ratio found in COPD patients as early as in GOLD II stage highlight the significance of protease/antiprotease imbalance for the development of COPD and potential use of these parameters as biomarkers for early diagnosis of COPD.

P13-13

The relationship between BAL IL-8 and DLCO in patients with COPD

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Background: Most patients with chronic obstructive pulmonary disease (COPD) develop emphysema with alveolar destruction and small airway inflamation, most caused by smoking. The inflamation is characterised by increased neutrophils, CD8+ T lymphocyte, macrophages and associated cytokines, chemokines and proteases. Interleukin 8 (IL-8) is one of the best characterised members of the chemokine family and one of the most important neutrophil chemoattractants. Lung function measurements included FEV1, FEV1/FVC % and diffusing capacity (DLCO). Decrease DLCO results showed that gases do not diffuse normally across lung membranes, this indicate that certain lung disease are present: COPD or interstitial lung disease. The aim was to investigate relationship between DLCO and BAL IL-8.

Material and methods: 51 patients (82% man) with COPD and 16 controls (43% man) were studied. The concentrations of IL-8 was measured by ELISA method (eBioscience). DLCO was performed with single breath method on Master screen (Jaeger). Results of DLCO is usually reported as the percent of predicted amount of carbon monoxide inhaled that should be absorbed.

Results: Statistically significant differences were not found between BAL levels IL-8 in COPD patients and control group (504 ± 666 pg/mL *vs*. 264 ± 256 pg/mL). Statistically significant differences were found between DLCO in COPD patients and control group (66.4 ± 22.8 % *vs*. 4.4 ± 23.0 at P level < 0.05). In addition, BAL IL-8 in COPD patients showed a strong negative correlation to DLCO (r= - 0.40, P < 0.05.).

Conclusions: These results showed that BAL IL-8 was signifficantly associated with DLCO in patients with COPD.

P14 - Microbiology - Infection

P14-01

Screening for the urinary tract infections using Sysmex UF 1000i flow cytometer

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Background: Bacterial cultures for the urinary tract infections (UTI) are the most common microbiological tests. Huge amounts of negative cultures demand for effective screening method reducing cost and time. The aim of this study was to evaluate the efficacy of UF 1000i flow cytometer for preselecting of negative results.

Material and methods: Urine specimens (N = 1226) suspected UTI were simultaneously cultured and analyzed by UF 1000i for bacterial (BC) and leukocyte (WBC) counts. Population: male:female = 1:2; ages: 0-15 years: 8%; 16-65 years: 59%; > 65 years: 33%; outpatient:inpatient = 4:1. For culture samples were inoculated using a 10 µL loop on selective agar plates. After standard incubation results were evaluated. A sample was considered negative for UTI if growth was < 103 CFU/mL (colony forming unit). Positive samples were attributed to one of the levels of CFU/mL (> 103, > 104, > 105).

Results: Using culture results as gold standard, we performed ROC analysis to determine area under curve (AUC), cutoff values (CO), sensitivities (SE), specificities (SP), negative predictive values (NPV) in pointing to BC and WBC measured by UF1000i.