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COMPARISON OF A NGAL PARTICLE-ENHANCED TURBIDIMETRY METHOD ADAPTED IN TWO DIFFERENT AUTOMATED ANALYSERS

<u>J. Rives Jimenez</u>⁴, M. Morales-Ruiz ³, F. Illana Cámara ², M. Aceitón Zabay ², I. Falcón Panella ¹, R. Ferrer Pérez ⁴, M.N. Nan ⁴, Á. García-Osuna ²

BACKGROUND-AIM

Acute kidney injury (AKI) is a common complication associated with decreased survival in patients with cirrhosis. Different types of AKI require different treatments; therefore it is crucial to distinguish among them. It is particularly important to distinguish between acute tubular necrosis (ATN) and hepatorrenal syndrome (HRS-AKI) since both have the worst prognosis among AKIs. They are also treated in different ways being renal replacement therapy the treatment for ATN and vasoconstrictors and albumin for HRS-AKI. Urinary neutrophil gelatinase—associated lipocalin (NGAL) expression is low in kidney cells in healthy condition but released when tubular injury appears. Urine NGAL determination and NGAL/creatinine ratio has been proven very valuable to distinguish ATN from other types of AKI. The study consists in a multicentric urinary NGAL method comparison adapted in two different automated analysers in order to discriminate ATN from other types of AKI.

METHODS

Fifty urine NGAL samples were analysed in two different analysers located in different laboratories using the same particle-enhanced turbidimetry method (BioPorto Diagnostics; Gentofte, Denmark). The analysis was first performed on the Advia 1800 Chemistry System analyser (Siemens Healthineers; Erlanger, Germany) and later on the Alinity c analyser (Abbott Laboratories; Illinois, USA). Both quantitative NGAL measurement and AKI status (ATN or not) according to cutoff point of 220 µg NGAL/g creatinine of the ratio were compared. Bland Altman plot, Passing Bablok regression, intraclass correlation coefficient (ICC) and Cohen's Kappa tests were performed when appropriate using Medcalc (MedCalc Software, Ostend, Belgium).

RESULTS

Quantitative NGAL results from both analysers were compared. Bland Altman plot showed a small difference of means between analysers and limits of agreement within the maximum allowed difference. Passing Bablok regression analysis showed both small systematic and proportional differences with an intercept of 4,56 (95%CI: -5,78-7,94) and a slope of 0,98 (95%CI: 0,92-1,06). Furthermore ICC for single measures was 0,99 showing a high degree of agreement between analysers.

Calculated ratio results were compared both quantitatively and qualitatively. Bland Altman plot showed small differences between analysers and Passing Bablok regression showed similar proportional differences but slightly higher systematic differences than for NGAL measurement alone with an intercept of 9,57 (95%CI: 2,52 – 19,74) and a slope of 0,96 (95%CI: 0,88 - 1,02). Classification agreement according to cutoff was assessed with Cohen's Kappa which was 0,90 consistent with excellent agreement between the analysers. Only one sample was classified differently by the two analysers as it was slightly above the cutoff measured in the Advia analyser and slightly below the cutoff in the Alinity C.

CONCLUSIONS

Here we assess a method for measuring NGAL that adapted to two different analysers yielding similar and interchangeable results in almost all patients. Our results support the utility and robustness of this methodology as a valuable tool to identify ATN patients regardless of the automated analyser available.

 $^{^1}$ CORE laboratory, Department of Biochemistry and Molecular Genetics, Hospital Clinic de Barcelona, Barcelona

²CORE laboratory, Department of Clinical Biochemistry, Hospital de la Santa Creu i Sant Pau, Barcelona

³Department of Biochemistry and Molecular Genetics, Hospital Clinic de Barcelona, Barcelona

⁴Department of Clinical Biochemistry, Hospital de la Santa Creu i Sant Pau, Barcelona

T111

POSSIBLE RENOPROTECTIVE EFFECTS OF GALANGIN ADMINISTRATION ON GENTAMICIN-INDUCED NEPHROTOXICITY RAT MODEL

O. Mosa 1

 1 Public health Department, Health Sciences College at Lieth, Umm Al Qura University, Makkah, KSA

BACKGROUND-AIM

Gentamicin is among the golden standard antibiotics used in clinical medicine. But, it has a significant damaging effect on kidney owing to the production of oxidative insults. Galangin is a valuable polyphenol and plant derived-radical scavenger. This flavonoid is reported to possess antioxidant, anti-radical and anti-cancer potential. Even so, there is no research linked to nephroprotective effect of Galangin. The current study was focused at determining the nephroprotective effect of Galangin.

METHODS

A dose 50, 100 and 200 μ g/ kg was administered to the animals. Gentamicin (80 mg/ kg) was utilized to develop nephrotic damage. At the end of the protocol; body mass, kidney mass, levels of Urea, TNF- α , IL-1 β , SOD, Catalase, GSH, GPx at renal homogenates and serum & urine Creatinine, BUN were performed along with histopathological findings.

RESULTS

Administration of Galangin resulted in restoration of kidney function parameters with markedly down-regulation of inflammatory cytokines. Moreover, histological findings showed marginal tissue damage with localized inflammatory precipitates.

CONCLUSIONS

Renal function tests was retrieved stepwise to normal values in response to Galangin administration. Histopathological findings also revealed improved renal anatomy with evidenced shrinkage of inflammatory area, suggesting possible renoprotective role against nephritic insult.

T112

THE PERFORMANCE OF SALIVA UREA NITROGEN AND SALIVA URIC ACID IN DIAGNOSING AND STAGING KIDNEY DISEASE: A COMPARATIVE STUDY

V.J. Ama Moor ¹, E. Sayap Mboumbi ¹, R. Gobina Mbua ¹, G. Ashutangtang ²

BACKGROUND-AIM

Saliva urea nitrogen (SUN) and saliva uric acid (SaUA) have shown promising results to diagnose and stage kidney disease. The study aimed to compare the performance of Sun and SaUA in diagnosing and staging of kidney disease.

METHODS

We screened consenting subjects with AKI, non-dialysed CKD stage 3-5 and healthy subjects in Yaounde (Cameroon) from February to May 2019. We excluded patients with confounders to serum creatinine (SCr), blood urea nitrogen (BUN) and blood uric acid (BUA). We requested the participant to respect a 15 minutes fast. Unstimulated saliva was collected in a plastic cup for SUN and SaUA assay by immerging semi-quantitative SaUA and SUN dipsticks into the saliva and observing a colour change after 1-2 minutes. We also collected venous blood for SCr, BUN and BUA assay by standard methods. We used Spearman's test to assess the correlation between SUN, SaUA, BUN, BUA and SCr. The performances of SUN and SaUA to diagnose and stage AKI and CKD was evaluated using the area under the curve. Diagnosis and staging of AKI and CKD was based on the KDIGO criteria and confirmed by a nephrologist.

RESULTS

We included a total of 80 participants, 33 with CKD, 32 AKI and 15 with no kidney disease. The mean age was 52 ± 16 years. The median SCr, BUN and SUN were significantly lower in the healthy group. The median BUA was significantly higher in the AKI group than the other groups (p<0.001). The median SUN increased significantly with AKI and CKD severity (p<0.001). There was a positive correlation between SUN and BUN in the AKI (r=0.688, p<0.001) and CKD groups (r=0.718, p<0.001). SUN showed a good performance in AKI diagnosis (AUC=0.872, sensitivity=84.8%, specificity=86.7%, cut-off value=15 mg/dl) and staging (AUC=0.780, sensitivity=76.2%, specificity=66.7%, cut-off value=25 mg/dl). SUN showed an excellent performance in diagnosing CKD (AUC of 0.927, sensitivity of 84.4%, specificity of 86.7% at a cut-off value of 15 mg/dl), and staging CKD (AUC=0.874, sensitivity=84.5%, specificity=76.9%, cut-off value=35 mg/dl) compared to SaUA.

CONCLUSIONS

SUN has a better performance than the SaUA in detecting and staging kidney disease, and a better performance in CKD than in AKI.

Keywords: acute kidney injury, chronic kidney disease, saliva urea nitrogen, saliva uric acid, serum creatinine,

¹Faculty of Medicine and Biomedical Sciences - University of Yaounde 1, CAMEROON

²Faculty of Medicine and Biomedical Sciences - University of Yaounde 1, CAMEROON / Faculty of Health Sciences, Bamenda, CAMEROON

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URINE SCREENING IN SCHOOL CHILDREN - TO DO OR NOT TO DO

M. Banerjee², M. Ligeswaran³, D. Roy¹, S. Tomo²

BACKGROUND-AIM

Chronic Kidney diseases (CKD) in children, although relatively uncommon, can be a devastating illness with long-term consequences. Data on prevalence of routine urinary abnormalities are unfortunately very scarce in Indian population when compared to global data. Early detection and management of kidney disease would reduce the progression and therefore national burden of paediatric CKD.

Urinalysis is a simple and inexpensive test that is a cornerstone in the evaluation of kidney functions. It can be easily employed for screening of renal abnormalities. Abnormalities detected in routine urinalysis such as glycosuria, pyuria, hematuria, and proteinuria are a common finding in clinical practice and patients are asymptomatic. An abnormal urinary test may be the earliest warning of a significant renal pathology. Although the incidence of urinary abnormality may be clinically insignificant or false positive in certain cases, studies from Korean, Taiwanese and Japanese paediatric screening programs indicate a clear advantage of early detection and effective intervention to prevent progression to ESRD.

METHODS

The present study is a cross sectional epidemiological study carried out in India. The study subjects were children attending a leading school in Jammu and Kashmir, India. The study was carried out among asymptomatic school children of 5-19 years of age. A total of 1676 students were recruited after obtaining informed consent from parents and the school administration.

Dipstick test (Multistix, Nicolas Piramel) was performed on the unspun urine specimen with reagent strip designed to react progressively producing color changes in given intervals. The results were decided by visual comparison of the test strip with a color chart provided on the bottle label.

Urinalysis was considered abnormal by dipstick if the following findings were detected:

- 1. Haematuria if >5-10 RBC/µl (Green dots on yellow test: intact erythrocytes; Uniform green coloration of test: free hemoglobin or hemolysed erythrocytes);
- 2. Proteinuria (>10 mg/dl)
- 3. Glycosuria (>100 mg/dl)
- 4. Leukocyturia (>25 WBC/μI)

Each urine sample detected to have haematuria on dipstick test underwent three microscopic examinations to rule out transient haematuria.

All patients with abnormal urine reports underwent routine blood tests and Ultrasonography of the Genitourinary system.

RESULTS

The a male to female ratio of 1.53:1. In total 76 children had urinary abnormalities with the prevalence rate of isolated haematuria in 1.9%, isolated proteinuria in 0.35% and glycosuria in 0.06%. Under Urine microscopic examination urinary crystals were observed in 9 children. When 76 children with abnormal urine dipstick tests were followed with urine microscopic examination, 44 children were observed to have abnormal findings. Of these 44 children, 4.5% children were having protein in urine, 34% had isolated RBC's, 47.7% were found to have isolated WBC's in urine. Further, when these 44 children were followed up with USG and blood investigations one child was identified to have hydronephrosis (right kidney) on USG.

A significant difference in both systolic (SBp) and diastolic blood pressure (DBp) was observed in children with haematuria. Both SBp and DBp was significantly higher in children with haematuria when compared to children without haematuria. Systolic & diastolic BP was higher in patients with proteinuria compared to those without proteinuria which was also found to be statistically significant.

CONCLUSIONS

Haematuria was the most common abnormality found in our studied group followed by proteinuria and glycosuria in that order. Both systolic & Diastolic Hypertension detected in children with haematuria & Proteinuria and the presence of Hydronephrosis in one child point towards the importance of urine screening in school children. Larger multicentric screening studies in school children with a cost benefit analysis are required to be taken to determine whether screening should be advocated in third world countries with considerable resource crunch.

¹All India Institute of Medical Sciences

²All India Institute of Medical Sciences, Jodhpur

³ESI Hospital & Medical College Chennai

T114

URINARY KIDNEY INJURY BIOMARKERS DETERMINED BY LC-MRM-MS IN HEALTH AND DISEASE

<u>T. Van Duijl</u>, R. Ruhaak , E. De Rooij , M. Treep , D. Kolle , N. Smit , F. Romijn , E. Hoogeveen , J. De Fijter , C. Cobbaert

BACKGROUND-AIM

Acute Kidney Injury (AKI) is a common (20%) complication in hospitalized patients and intensive care unit (30-50%). Early stages of AKI are poorly detected by current kidney function parameters. To target the unmet clinical need of early kidney injury detection, we developed a multiplex mass spectrometry (MS)-based test to quantify the protein-based kidney injury biomarkers KIM-1, NGAL, TIMP2, IGFBP7, CXCL9, TGF-β1, nephrin, SLC22A2, CUB, CALB and UMOD from urine. This test was analytically validated for matrix effects, carryover, imprecision, selectivity, stability and compared to immunoassays. In this study we aimed to establish reference intervals (RI) of the biomarkers and explore the concentration profile in kidney transplant patients with ischemic kidney injury.

METHODS

24-h urine samples from 1443 apparently healthy middle-aged individuals were analysed to set RI. To pilot the biomarker panel in ischemic injury, additional samples of patients who received a renal allograft were analysed. To determine the biomarker concentrations, target proteins were immunocaptured and stable-isotope labelled peptides were added as internal standard. Hereafter, proteins were denatured, reduced, alkylated and enzymatically digested into peptides prior to analysis by liquid chromatography coupled to tandem MS in multiple reaction monitoring mode (LC-MRM-MS). Five external calibrators were prepared to obtain results in molar units and the instrument and test performance were monitored by system suitability testing and QCs.

RESULTS

A total of 60 peptides from 11 proteins were quantified in one LC-MRM-MS run monitoring 180 transitions. Urinary biomarkers needed corretion for urine dilution by creatinine or osmolality. The RI were tested overall and stratified by sex, demographics and comorbidities as partition criteria. The unisex reference intervals based on the 2.5th – 97.5th percentile were <0.1 – 2.5 (pmol/L)/(mOsmol/kg) NGAL, 0.3 – 1.8 (pmol/L)/(mOsmol/kg) IGFBP7, 0.1 – 0.8 (pmol/L)/(mOsmol/kg) TIMP2, <0.1 - 0.1 (pmol/L)/(mOsmol/kg) KIM-1, 0.3 – 3.3 arbitrary units (AU) CUB and 0.3 – 4.1 AU UMOD, while the other proteins were below the limit of detection (<10 pmol/L). Inflammatory cytokine CXCL9 and the kidney injury biomarkers were elevated in ischemic injury, while UMOD was decreased.

CONCLUSIONS

We here present clinical data measured with a lab-developed-test for multiplex quantitation of urinary kidney injury biomarkers. The established RIs allow interpretation of injury biomarker levels in patients with suspected AKI and are a first step in the translation of this kidney injury panel to the clinic.

¹Department of Clinical Chemistry and Laboratory Medicine, Leiden University Medical Centre, Leiden, The Netherlands

²Department of Clinical Epidemiology, Leiden University Medical Center, Leiden, The Netherlands

³Department of Nephrology, Leiden University Medical Center, The Netherlands

T115

EFFECT OF HEMODIALYSIS ON LEVELS OF CARDIAC BIOMARKERS

L. González García², S. Bérgamo Vázquez², C. González Fernández², M. Sala Grau², A.P. Balius Matas¹, N. Garra Moncau¹, I. Comerma Coma¹, J.M. Galceran Gui¹, I. Naval Marcos¹, J. De La Torre Mckinney¹, E. Massó Jiménez¹, J. Trapé Pujol² Dialysis, Nephrology, Althaia- Xarxa Assistencial Universitaria de Manresa, Manresa

BACKGROUND-AIM

Cardiac biomarkers such as troponin I (TnI), High-sensitivity cardiac troponin T (Hs-TnT) and N-terminal pro-brain natriuretic peptide (Nt-proBNP) are essential for the diagnosis of heart failure, whether an acute coronary syndrome or cardiac ischaemia. However, the effect of hemodialysis (HD) on serum levels of cardiac biomarkers still remain unclear. In end-stage renal disease, baseline of TnI, hs-TnT and Nt-proBNP levels are often elevated, and it is unknown whether the HD procedure affects those levels. This leaves clinicians unsure of how to interpret cardiac biomarkers in HD patients with symptoms of heart failure.

Determine if serum levels of TnI, hs-TnT and Nt-proBNP vary after HD treatment.

METHODS

Serum samples were collected from 92 patients before and after HD treatments. TnI, hs-TnT and Nt-proBNP were prospectively measured at pre-dialysis and post-dialysis by electrochemiluminescence (ECLIA) assays (hs-TnT and Nt-proBNP, Roche Diagnostics®) (TnI, Beckman Coulter®).

Variables are reported as median and interquartile range (IQR). Differences were assessed with U Mann Whitney Test due to the non-normal distribution data. Significance was set at p<0.05.

RESULTS

Ninety-two HD patients, 58 men (63%) and 34 women (37%) with a mean age of 69.75±13.79 years (mean±SD) were enrolled in the study.

After HD treatment, TnI decreased by 7.34% (IC95%: 3.59-11.09), hs-TnT decreased by 15.81% (IC95%: 11.77-19.85), and Nt-proBNP decreased by 41.80% (IC95%: 35.22-48.39).

At pre-dialysis, TnI median concentration was 13.55 ng/L (IQR: 8.05-25.30), Hs-TnT was 53.10 ng/L (IQR: 33.70-94.38) and Nt-proBNP was 3308 pg/mL (IQR: 1563.50-9820.75). At post-dialysis TnI median concentration was 12.50 ng/L (IQR: 7.00-22.70), Hs-TnT was 44.25 ng/L (IQR: 27.48-77.75) and Nt-proBNP was 1783.50 pg/mL (IQR: 619.00-4578.25). When we compared these results, a significant decline in median Nt-proBNP was noted with HD (p=0,001). No differences were demonstrated in TnI and Hs-TnT serum levels (p=0.349 and p=0.095).

CONCLUSIONS

This study demonstrates a decline of TnI, hs-TnT and Nt-proBNP concentrations after HD treatment. Interpretation of cardiac biomarkers changes during HD and it must take into consideration with respect to the moment of specimen collection (predialysis or post-dialysis).

²Laboratory Medicine, Althaia- Xarxa Assistencial Universitaria de Manresa, Manresa

T116

MONITORING SARS-COV-2 ANTIBODY IN VACCINATED HEMODIALYSIS PATIENTS

<u>S. Bérgamo Vázquez</u>², L. González García², C. González Fernández², M. Sala Grau², A.P. Balius Matas¹, M. Fenollar Boixader¹, N. Garra Moncau¹, J.M. Galceran Gui¹, I. Naval Marcos¹, J. De La Torre Mckinney¹, E. Massó Jiménez¹, J. Trapé²

BACKGROUND-AIM

In the last year different vaccines were approved against SARS-CoV-2. All of them have the spike protein of the virus as a target. In vaccinated patients we can find in serum samples anti-spike IgG antibody SARS-CoV-2 (SIgG SARS-CoV-2) Nowadays, it is unknown the duration of humoral response as long as if anti-spike (S) IgG antibody levels decrease or be stable along the time. In addition, it is unknown if patients with previous history of SARS-CoV-2 infection can affect in their antibody's concentration or duration along the time are different in comparison with patients with no previous history of infection.

Monitoring SIgG SARS-CoV-2 concentration after vaccination in patients with end-stage renal disease treated by hemodialysis (ESRD) with previous history of SARS-CoV-2 infection and patients with no previous infection history.

METHODS

The study was based on 98 patients with ESRD between April 15- July 30. We collected the first sample 45 days after patients being vaccinated, and then a new sample every 45 days. Serum SIgG SARS-CoV-2 was measured by electrochemiluminescence (ECLIA) assay (Access DXi- Beckman Coulter®).

Due to the non-normal distribution data differences were assessed with Kruskal Wallis Test and significance was set at p<0.05.

RESULTS

The median concentration of SIgG SARS-CoV-2 in patients with no previous history of infection was 12.02 UI/mL, 4.26 UI/mL and 1.33 UI/mL (IQR:3.48-27.7, 1.08-11.6 ad 0.36-3.66) for the first, second and third sample. When we compared these results in this group, we observed differences on S IgG antibody concentrations in all groups (p=0.002 between first and second sample, p<0.001 between first and third sample, p=0.001 between second and third sample). The median concentration of S antibody in patients with previous history of SARS- CoV-2 infection was 45.3 UI/mL, 45.9 UI/mL and 34.7 UI/mL (IQR:27.9-55.6, 28.4-53.4 and 22.4-49.5) for the first, second and third sample. In this group no differences were observed in S IgG antibody levels.

CONCLUSIONS

This study shows SIgG antibody was maintained over time in patients after virus infection while SIgG antibody decreased in the same period time in patients without history of infection.

¹Dialysis,Nephrology, Althaia- Xarxa Assistencial Universitaria de Manresa, Manresa

²Laboratory Medicine, Althaia- Xarxa Assistencial Universitaria de Manresa, Manresa

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COMPARISON OF THREE SERUM CREATININE QUANTIFICATION METHODS: ENZYMATIC METHOD ON ALINITY ABBOTT®, ENZYMATIC METHOD ON COBAS ROCHE® AND JAFFE METHOD ON ALINITY ABBOTT®

P. Brouwers, R. Gadisseur, A. Ladang, C. Caracalla, E. Brévers, C. Le Goff, E. Cavalier, Clinical Chemistry Department, University Hospital of Liege, Liege, Belgium

BACKGROUND-AIM

Creatin is synthetized by the liver and stored in skeletal muscles. Creatinine is a degradation product of creatin, consistently produced and eliminated in urine by glomerular filtration and tubular secretion. The determination of serum creatinine is one of the most prescribed biological assays in clinical practice to evaluate the renal function. Creatinine can be measured by two methods: the first based on the Jaffe reaction with a colorimetric detection and the second by enzymatic methods. Therefore, the aim of the study which was to compare the serum creatinine concentrations obtained by the different quantification methods was a great deal of interest.

METHODS

According to CLSI EP9-A2 guidelines, 40 random serum samples were collected among the measurement interval. The serum creatinine concentrations selection ranged from 0.28 to 14.61 mg/dL. Daily internal quality controls supplied by the firms were used to validate the calibration performed on each instrument. The same day, each sample was injected in duplicate on each analyzer. Serum creatinine concentrations were measured by Alinity Abbott® and Cobas Roche® analyzers. The data were analyzed by MedCalc® statistical software in order to evaluate the equivalence between the different methods. The values measured were plotted against each other and Passing-Bablok regressions were calculated, as well as Bland-Altman plots.

RESULTS

The regression equations were: [Cobas Enz.]=0.098+0.99[Alinity Enz.], [Alinity Jaffe]=0.06+0.99[Alinity Jaffe]=0.06+0.99[Alinity Enz.], [Alinity Jaffe]=0.06+0.99[Alinity Jaffe]=0.06+0.99[Alinity Jaffe]=0.06+0.99[Alinity Jaffe]=

CONCLUSIONS

The three quantification methods are thus comparable for the determination of serum creatinine. However, it has been previously proved that enzymatic methods turn out to be significantly more precise.

T118

USING MACHINE LEARNING AND AN INDIRECT APPROACH TO ESTIMATE CONTINUOUS AGE-DEPENDENT LOWER REFERENCE LIMITS OF ESTIMATED GLOMERUAL FILTRATION RATE (EGFR) FROM 30 TO 85 YEARS – IMPLICATIONS FOR CHRONIC KIDNEY DISEASE (CKD) PREVALENCE

<u>J. Adler</u>², E. Taneva ², T. Ansorge ², P.R. Mertens ¹

BACKGROUND-ATM

As it is known that renal function declines with age, several recent articles discussed the need for an age-dependent definition of chronic kidney disease (CKD) and its impact on the prevalence of CKD. Furthermore, several studies estimating the prevalence of CKD did not fulfil the definition of chronicity, that is impaired kidney function ≥ 3 months, leading to an overestimation of CKD prevalence.

METHODS

A real-world data set from patients with age from 30 to 85 years and inconspicuous urinalysis was used to estimate the lower reference limit of Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) eGFR for each year of age by using an indirect approach for determination of reference intervals. In the following, an Akaike information criterion (AIC) optimized local regression model was calculated to predict the continuous age-dependent lower reference limits. The derived reference limits were used to calculate the prevalence of CKD in a validation dataset. Prevalence calculation was done once without and once with application of the chronicity criterion on the validation data set.

RESULTS

The model resulted in age-dependent lower reference limits of eGFR that were comparable to previously published data. The lower reference limit of CKD-EPI-eGFR decreased from 73 ml/min to 33 ml/min with increasing age. Several articles have pointed out that the prevalence of CKD, which is estimated in many papers to be between 10 and 16%, decreased to approximately 6% when age-dependent eGFR reference limits and the chronicity criterion was applied. By applying age-dependent lower reference limits of eGFR together with the chronicity criterion on the validation data set, the CKD prevalence decreased from 7.1% (95%-CI: 7.0-7.2, age-dependent lower reference limits without chronicity criterion) to 5.4% (95%-CI: 5.1-5.7, age-dependent lower reference limits together with chronicity criterion).

CONCLUSIONS

Using an indirect approach for determination of lower reference limits together with a machine learning algorithm to calculate the best local regression model, we were able to confirm the lower CKD prevalence published in recent work. The results additionally speak for the robustness of the applied indirect method for calculation of reference intervals.

 $^{^1}$ Clinic of Nephrology and Hypertension, Diabetes and Endocrinology, Otto-von-Guericke-University Magdeburg

²Medical Laboratory for Clinical Chemistry, Microbiology, Infectious Diseases and Genetics "Prof. Schenk/Dr. Ansorge & Colleagues" Magdeburg

T119

MODIFICATIONS IN TOTAL AND IONIZED MAGNESIUM DURING HEMODIALYSIS DEPEND ON GENDER AND DIALYSIS BATH COMPOSITION.

M. Bauvais ¹, T. Vérité ², M. Carpentier ¹, A. Hay-Lombardie ¹, A. Chapelet ², L. Figueres ³, E. Bigot-Corbel ¹

BACKGROUND-AIM

Ionized magnesium (iMg) represents 65-70% of total blood magnesium (tMg) and the physiologically active fraction. Little data is available on iMg, because the availability of the test is fairly new. In hemodialyzed patients with end-stage renal disease (ESRD), the exploration of Mg metabolism seems to be essential because hypomagnesemia is associated with higher mortality and vascular calcifications.

METHODS

We measured tMg on Cobas Roche (Meylan, France) and iMg on Prime + Nova biomedical (Boston, USA), before (B) and after (A) hemodialysis in 71 patients with ESRD. Percentage of ionized magnesium (iMg%) was calculated. The difference (Δ) between before and after dialysis of tMg, iMg and iMg% was compared to usual parameters of mineral and bone disorders (MBD). Statistical analyses were performed with XLSTAT software.

RESULTS

The enrollment distribution was 26 female (F), 45 male (M), 66 citrate-hemodialysis and 5 acetate-hemodialysis. The mean \pm SD were: 0,847 \pm 0,134 mmol/L (B) and 0,722 \pm 0,052 mmol/L (A) tMg, 0,556 \pm 0,083 mmol/L (B) and 0,524 \pm 0,074 mmol/L (A) iMg, 65,7 \pm 5,2% (B) and 66,1 \pm 4,9% (A) iMg%. No significant difference was observed between male and female for tMg, iMg% and also for total calcium (tCa), ionized calcium (iCa), Δ tCa, iCa%, and phosphate before and after dialysis, as well as PTH and 25 OH-vitamin D before dialysis. The increase of iCa during dialysis was significantly higher in male, whereas the diminution of tMg and iMg was significantly higher with female. No difference of albuminemia was observed during dialysis between male and female. Sixteen patients presenting with high values of PTH (above KDIGO recommendations) had an iCa and iCa% significantly lower as compared to patients with PTH values included in the recommendations; these 16 patients had also a significantly higher blood creatinine but no significant difference for tMg, iMg, Δ tMg, Δ iMg and iMg%. The 5 patients treated by acetate dialysis (only M), presented significantly difference values of tMg and iMg before and after dialysis than those treated by citrate-dialysis, without difference for Δ tMg, Δ iMg and iMg%.

CONCLUSIONS

The variations observed during dialysis seem depending on sex and dialysis bath used. No relation has been found between tMg and iMg with other electrolytes linked to MBD before/after dialysis.

¹Laboratoire de Biochimie, Centre Hospitalier et Universitaire de Nantes, Hôpital Guillaume et René Laënnec, Bd Jacques Monod, 44093 Nantes Cedex

²Service d'hémodialyse chronique, ITUN, Centre Hospitalier et Universitaire de Nantes

³Service d'hémodialyse chronique, ITUN, Centre Hospitalier et Universitaire de Nantes- CRTI, Université de Nantes

T120

THE IMPACT OF SARS-COV2 INFECTION IN HOSPITALIZED PATIENTS' KIDNEY FUNCTION

<u>C. Rodriguez-Chacón</u>¹, R. Galván Toribio ¹, C. Sánchez Mora ¹, P. Fernández-Riejos ¹, W.A. Aguilera Morales ², A. León Justel ¹

BACKGROUND-AIM

SARS-COV-2 infection is primarily considered a respiratory disease. The kidney can also be affected since virus enters cells through the receptor for angiotensin converting enzyme II. The aim of this study was to determinate the relationship between kidney damage and clinical outcomes in positive COVID patients.

METHODS

Descriptive and retrospective data analysis of 801 SARS-COV-2 patients admitted to our hospital from September to November 2020. Qualitative variables have been described by frequency tables and percentages, quantitative ones through measures of centralization and dispersion. Statistical analysis was carried out with the statistical program IBM SPSS Statistic 26 and statistical significance was considered for p<.05. The Chi-square test has been applied to explore the possible relationship between death, gender and acute kidney injury (AKI). Moreover, this statistical test was used to investigate in positive COVID patients who suffered AKI if their doctors performed an analytical control 3 months postadmission. The relationship between death, age groups (<46, 46-65, >65-years old) and Estimated Glomerular Filtration Rate (eGFR) has been realized with Mann-Whitney U test.

RESULTS

In this retrospective study, no gender-attributable statistically significant differences in death by SARS COV-2 infection were found. Differences have been found in the distribution of both groups of patients according to age groups and development of acute kidney failure (p<.05). Deceased patients show significantly lower eGFR values than surviving patients (p<.05).50,9% of all surviving patients were not performed analytical control. Differences have been found in the distribution of both groups of patients (AKI or not) according to analytical control, 64,3% AKI patients were analytically controlled at 3 months, compared to 47,7% of no AKI patients (p<.05).

CONCLUSIONS

Decease is more frequent in older patients and patients who develop AKI. Half of the surviving patients were not analytical controlled at 3 months. The lack of renal control in surviving patients leads to lost opportunities for prevention, inadequate or inappropriate care of patients may contribute to renal disease progression.

¹LABORATORY MEDICINE DEPARTMENT - VIRGEN MACARENA UNIVERSITY HOSPITAL

²NEPHROLOGY DEPARTMENT - VIRGEN MACARENA UNIVERSITY HOSPITAL

T121

FAMILIAL HYPOMAGNESEMIA WITH HYPERCALCIURIA AND NEPHROCALCINOSIS. A CASE REPORT

L. Fraile García¹, B. Montero-San-Martin¹, M. Font Font¹, A. Muñoz Santa¹, A. Cumplido Portillo¹, M. Bernal Morillo¹, D. Queimaliños Pérez¹, A. Sopena Murillo¹, M. Ibarz Escuer¹

BACKGROUND-AIM

Tubulopathies are autosomal recessive inherited clinical alterations which affect the renal tubule. Familial Hypomagnesemia with Hypercalciuria and Nephrocalcinosis (FHHNC) is a tubulopathy characterized by renal loss of magnesium (MG) and calcium (CA), due to the disruption of the selectivity of the tight junction pores, altering the paracellular reabsorption of CA and MG in the ascending segment of the Henle's loop. Recessive mutations in CLDN16 or CLDN19 are the most common disease causes. FHHNC has been more frequently diagnosed in areas where there is a significant consanguinity level and usually develops into a chronic renal disease. For this reason, an early diagnosis based on laboratory tests and family clinical history can prevent important complications.

METHODS

A 7-year-old boy came to the Nephrology Department due to polydipsia of 5 months of evolution. Clinical history: severe myopia, ongoing hyperparathyroidism (HP) treatment and rickets secondary to vitamin-D deficiency. Renal ultrasound, blood test, 24-hour urinalysis and a familiar genetic study were performed.

RESULTS

Renal ultrasound showed kidneys with medullary pyramids which were consistent with nephrocalcinosis. Serum test results: Creatinine 0.93 mg/dL [0.26-0.77], GFR 52 ml/min/1.73m² [>90], CA 9.76 mg/dL [8.8-10.8], MG 0.61 mmol/L [0.66-0.99]. 24-hour urinalysis revealed a renal disorder: Creatinine 443 mg/day [600-2000], CA 13 mg/kg/day [<4], CA/Creat 0.67 mg/mg [<0.2], MG 4.06 mg/kg/day [1-3.2], MG/Creat 0.21 mg/mg [0.05-0.18]. The genetic study showed a homozygous mutation in CLDN19 in our patient and in his brother. The parents, who shared consanguinity, were both carriers of the mutation.

CONCLUSIONS

These results allowed us to confirm the diagnosis of FHHNC. Normal serum CA levels can be an effect of the HP treatment. HP and other disorders can also be a consequence of the FHHNC. Furthermore, the mutation in CLDN19 is related to ocular abnormalities which do not occur with the mutation in CLDN16. There are no differences between both of them in the renal disorder level. Laboratory results and family history guide us towards the diagnosis of this hereditary kidney disease, a common example of the "founder effect" in small areas as a result of the loss of genetic variation.

¹Hospital Universitari Arnau de Vilanova de Lleida

T122

THE ROLE OF THE LABORATORY IN THE EARLY DETECTION OF ACUTE KIDNEY INJURY IN HOSPITALISED PATIENTS

R. Galván Toribio¹, C. Rodriguez-Chacón¹, P. Fernández-Riejos¹, C. Sánchez-Mora¹, M. Salgueira Lazo², A. León Justel¹
Medicine Laboratory Department - Virgen Macarena University Hospital

BACKGROUND-AIM

It is estimated that more than 23% of all hospitalized patients suffer from Acute Kidney Injury (AKI). Early detection of these patients is very important to avoid the morbidity and mortality associated with kidney damage, which complicates their hospital stay. For this purpose, we have implemented an "immediate warning" system from the laboratory based on serum creatinine data. The aim of this study is to evaluate whether this intervention helps to reduce the hospital stay and mortality of patients with AKI.

METHODS

Descriptive and retrospective data analysis of 249 patients who developed AKI during their hospital stay. Of these patients, 91 were followed up according to the lab-proposed intervention. Qualitative variables have been described by frequency tables and percentages, quantitative ones through measures of centralization and dispersion. Statistical analysis was carried out with the statistical program IBM SPSS Statistic 26 and statistical significance was considered for p<.05. The Chi-square test has been applied to evaluate possible differences in mortality, gender and age between groups. This test was also used to assess whether the different medical specialties respond differently to the protocol. Mann-Whitney U test was realized to evaluate the duration of hospitalization in both groups.

RESULTS

In this retrospective study, neither age nor gender-attributable statistically significant differences in protocol compliance were found. Mortality was statistically significantly higher in the group not assessed with the lab-proposed intervention (p<.05). No differences have been found in the response to the protocol between the different units (medical vs. surgical specialties). There was also no significant differences in the length of the hospital stay between the two groups (p>.05).

CONCLUSIONS

After 6 months of implantation, we have demonstrate that laboratory intervention in the early detection of AKI through the alert system reduces the mortality of patients with AKI. All medical units of the hospital are equally responsive to compliance with the protocol. Hospital stay is not decreased by the intervention although it would be desirable to increase the study population and the follow-up period to confirm this conclusion.

²Nephrology Department - Virgen Macarena University Hospital

T123

DIAGNOSIS AND MANAGEMENT OF PAEDIATRIC CORTICOSTEROID-DEPENDENT NEPHROTIC SYNDROME

S. Martinez Martin 1, M.T. De Haro Romero 1, L. Martinez Carreras 1, I.M. Portell Rigo 1, M.B. Sanz Pinazo 1, C. Avivar Oyonarte 1

¹HOSPITAL DE PONIENTE

BACKGROUND-AIM

Nephrotic syndrome is the most common primary glomerulopathy described in the pediatric population. It is classified as primary or idiopathic, secondary and congenital. Primary nephrotic syndrome represents more than 90% of all diagnosed cases being the most frequent age of onset being 2-8 years and predominantly in males.

METHODS

An 8-years-old male went to the emergency department with generalized swelling of his legs and pain on walking of 14 days of evolution. Physical examination revealed edema in the abdomen, lower limbs, eyelids and mild hydrocele, intra-abdominal free fluid and bilateral pleural effusion.

Biochemistry, hemogram and urine biochemistry were requested, highlighting the urine protein/creatinine ratio of 10.48 mg/mg (0-0.2) showing nephrotic-range proteinuria, accompanied with hypoalbuminemia, less than 1.5 g/dl (3.5-5.2); hyperlipidemia with total cholesterol 440 mg/dl (140-200); IgG deficiency 78 mg/dl (700-1600) and subclinical hypothyroidism with TSH 7.4 μ IU/ml (0.36-5.50).

To know the etiology of the nephrotic syndrome debut, the analytics were extended to autoimmunity (antinuclear antibodies, antineutrophil cytoplasm antibodies) and infectious immunodiagnostics (Cytomegalovirus, Epstein-Barr virus, Hepatitis B and C, Varicella-zoster virus, Chlamidophyla pneumoniae, Mycoplasma pneumoniae) obtaining negative results in both.

RESULTS

The patient's clinical manifestations and the laboratory findings before described confirming the diagnosis of idiopathic nephrotic syndrome debut, starting the treatment with corticosteroids.

The patient's follow-up revealed 3 relapses in less than a year during the decrease of corticotherapy from 60 mg/day to 40 mg/48h, so a diagnosis of cortico-dependent nephrotic syndrome was made and immunosuppressive treatment was changed to mycophenolate mofetil. In subsequent reviews, it is seen as an adequate response to treatment.

CONCLUSIONS

The diagnosis of the nephrotic syndrome depends mainly on clinical laboratory data. Optimal treatment is based on the use of corticosteroids, reserving immunosuppressants such as cyclophosphamide or mycophenolate for cases of resistance, the presence of side effects or, as in our case, corticodependence. Their use help to avoid frequent relapses that increase the risk of long-term chronic kidney disease.

T124

COMPARISON OF SECOND AND THIRD GENERATION PARATHYROID HORMONE ASSAYS IN PATIENTS WITH KIDNEY FAILURE

M. Pavic¹, A. Bronic¹, A. Radman¹

BACKGROUND-AIM

Parathyroid hormone (PTH) is essential in pathogenesis of bone abnormalities in patients with impared kidney function. The third-generation of whole PTH (wPTH) assays was designed to overcome problems with C-terminal fragment detection in second generation of intact PTH (iPTH) assays. The aim was to compare PTH levels obtained by wPTH and iPTH method as well as to assess degree of their correlation with kidney function and calcium-phosphorus concentration.

METHODS

PTH was measured in plasma of 99 patients by wPTH and iPTH method using same Cobas e411(Roche) platform. According to calculated estimated glomerular filtration rates (e-GFR) by the recommended CKD-EPI equation, patients were divided into groups (G), (GI (N=16) \geq 90, GII (N=30) 60-89, GIII (N=37) 30-59, GIV (N=16) <29 ml/min/1.73m²). Data on of calcium, phosphorus and creatinine serum levels were retrospectively collected. Statistical analysis was carried out with MedCalc 11.5.1.0. statistical software (MedCalc, Belgium).

RESULTS

The median age of the 99 patients was 73 (30-95) years. iPTH and wPTH median (interquartile range) values in pmol/L were (GI:3.91 (3.24-4.69) vs. 3.58 (2.88-4.12), P=0.001; GII:5.53 (4.10-6.81) vs. 4.63 (3.25-5.97), P<0.001; GIII:6.17 (4.06-9.00) vs. 5.59 (3.62-8.07), P<0.001; GIV:12.53 (8.86-28.42) vs. 10.13 (7.91-22.90), P<0.001), respectively. Bland-Altman analysis showed constant and proportional difference in all groups, with increasing difference in higher range of measurements. By Passing-Bablok, complete agreement between the methods was obtained for GI, whereas clinically significant difference showed all other groups: constant (GII), proportional (GIII) and both, constant and proportional (GIV). iPTH and wPTH concentrations positIvely correlated with phosphorus (r=0.369, P<0.001; r=0.303, P=0.003 respectively), creatinine (r=0.639, P<0.001; r=0.643 P<0.001 respectively) and negatively with calcium (r=-0.537, P<0.001; r=-0.558, P<0.001 respectively).

CONCLUSIONS

PTH results obtained with two different assay generations could be used interchangeably in patients with normal eGFR, but not in patients with impared kidney function. However, both assays correlated with kidney function, calcium and phosphorus parameters to the same extent.

 $^{^{}m 1}$ Department of Clinical Chemistry, Sestre Milosrdnice University Hospital Center, Zagreb, Croatia

T125

CLEARANCE OF BETAIN AS BIOMARKER IN EVALUATION OF GLOMERULAR FILTRATION RATE

<u>I. Isakov</u>¹, V. Čabarkapa², B. Ilinčić², S. Vukmirović³, I. Radosavkić¹

BACKGROUND-AIM

In a case of chronic kidney disease (CKD), current biomarkers, such as serum creatinine and urinary albumin, have important limitations when used to identify the earliest indication of CKD or in tracking the progression to more advanced CKD. There is therefore an increasing need to find new serum and urine biomarkers capable of estimating the risk of CKD in healthy individuals or progression of the existing disease. Current metabolomics technologies can enable discovery and validation of metabolic indicators of the disease. Aim of this study was to determine association between betaine clearance (BC) and known markers of kidney function.

METHODS

The study included 66 patients with CKD devided into two groups: I group 26 patients (M=11, F=15) with eGFR > 60ml/min, II group 40 patients (M=22, F=18) with eGFR < 60 ml/min) and 11 healthy subjects (M=6, F=5). To all participant, we measured Glomerular Filtratiron Rate (GFR) by radionuclide clearance Diethylene Triamine Pentaacetic Acid (DTPA) and estimated GFR by selected blood parameters realted to CKD diagnostics (serum creatinine, cysC). Serum and urine concentration of betaine were determined by using High Performance Liquid Chromatography (HPLC) and BC were calculated by equation.

RESULTS

BC in the I group (14.5 (IQR-12.75) μ g/ml vs. 28.0 (IQR-19.75) μ g/ml, p= 0,007) was significantly lower compared to II group. BC in the control group were significantly lower compared to tested groups (10 (IQR-7) μ g/ml vs. 14.5 (IQR-12.75) μ g/ml vs. 28.0 (IQR-19.75) μ g/ml, p< 0.001). Correlation between BC and mGFR (r=-0.44, p<0.001) and MDRD-eGFR (r=-0.5, p=0,001), CysC-eGFR (r=-0.46, p<0.001).

CONCLUSIONS

According to our results, BC could be considered as a potential metabolic biomarker of GFR. The main limitation of our study are relatively small sample size.

¹Centre of Laboratory Medicine, Clinical Centre of Vojvodina, Novi Sad

 $^{^2}$ Faculty of Medicine, Department of Pathophysiology and Laboratory Medicine, University of Novi Sad

³Faculty of Medicine, Department of Pharmacology, Toxicology and Clinical Pharmacology, University of Novi Sad

T126

MICROALBUMINURIA IN PATIENTS WITH HYPERTENSION VISITING TERTIARY CARE CENTRE, WESTERN NEPAL

Y. Twayana¹, B. Tamang¹, B.R. Pokhrel¹, A.C. Jha¹, N. Gautam¹, A. Jayan¹, P.R. Dhakal¹ Universal college of medical sciences, Bhairahawa, Rupandehi, Nepal

BACKGROUND-AIM

Renal complications of hypertension are associated with high morbidity and mortality. Prediction of such complications at the earliest is of utmost importance. We aimed to assess microalbuminuria as a marker to see the effect of hypertension on kidney function.

METHODS

A total of 130 clinically diagnosed hypertensive patients were enrolled in the study. Biochemical parameters that included serum creatinine, urinary albumin, and urinary creatinine were measured using standard methods. Albumin Creatinine ratio (ACR) and estimated glomerular filtration rate (eGFR) were calculated. ACR values between 30-300 mg/g were considered as microalbuminuria. Statistical analysis was performed on 120 samples after excluding frank proteinuria.

RESULTS

The prevalence of microalbuminuria in hypertensive patients was about 19%. Mean ranks of systolic blood pressure, pulse pressure, and serum creatinine levels were significantly higher in hypertensive patients with microalbuminuria. Mean eGFR was significantly low in hypertensive patients with microalbuminuria. Increased BMI, older age, and increased duration and severity of hypertension were not associated with a higher prevalence of microalbuminuria.

CONCLUSIONS

The prevalence of microalbuminuria was high in hypertensive patients. Established renal function parameters like serum creatinine and eGFR were significantly altered in patients with microalbuminuria. Early screening of microalbuminuria in such patients might help prevent renal complications.

T127

POPULATION CIRCADIAN RHYTHM: FROM BIOLOGICAL VARIATION TO CIRCADIAN ORGANIZATION IN DATA FROM TWO HOSPITALS.

M. Lorenzo-Lozano¹, A. Blázquez-Manzanera⁴, D. Melguizo-Melguizo¹, P. Fuentes-Bullejos¹, A.M. López Martos¹, E. De Rafael Glez¹, B. Elorza Barroeta², J.A. Carnicero³

BACKGROUND-AIM

A circadian regulation of renal function it has been described in the last few years. An intraday variation in glomerular filtration rate (eGFR) has also been discovered at the individual level.

The aim of this study was to check if there exists a circadian pattern of eGFR at population data group level and to compare the population results with those described at individual level.

METHODS

We have studied a total of 446441 samples analyzed in the emergency laboratories of two Spanish hospitals between January 2015 and December 2019. We selected all the records of eGFR values between 60 and 140 mL/min/1.73 m2 using CKD-EPI formula from patients between 18 and 85 years, apparently healthy.

The intraday intrinsic eGFR-pattern was computed using the extraction time of day in four nested harmonic regression models.

RESULTS

All models showed an intraday eGFR-pattern, but the estimated model coefficients differed depending on whether age was included. The inclusion of age improved the performance of the model. In this model, the acrophase occurred at 7:46 hours and the bathyphase at 19:46 hours, very similar to individual rhythm

CONCLUSIONS

We describe the distribution of eGFR values depending on the time in two different populations. This distribution is adjusted to a circadian rhythm that behaves similarly to the individual rhythm. This pattern is similar in each of the years studied from each hospital as well as between both hospitals. These results suggest the incorporation of the concept of "population circadian rhythm".

¹Complejo Hospitalario Universitario de Toledo

²Farmacia - UCM

³Fundación de Investigación Biomédica del Hospital Universitario de Getafe. Getafe. Spain

⁴Hospital General de Villarrobledo

T128

INTERLEUKIN-6 (IL-6) AND C-REACTIVE PROTEIN (CRP) AS MARKERS IN HEMODIALYSIS PATIENTS.

B. Hyseni¹, J. Bundo¹, E. Seitaj¹
LUAR MEDICAL CENTER

BACKGROUND-AIM

Interleukin-6 (IL-6) and C-reactive protein (CRP) as markers in hemodialysis and their correlation in patients morbidity.

METHODS

The cross-sectional trial involved 84 patients all between 20-78 years (58 average age). All patients in the hemodialysis department including consensus criteria. Patients enrolled were undergoing hemodialysis procedures from 2015 – 2021. We evaluated Interleukin-6 (IL-6) and C-reactive protein (CRP) in 52 men and 32 women as the most common markers used in our unit. We observed for correlation between those markers, in associations with the clinical risk factors. As predicted as many risk factors we involve the increasing levels were observed. The primary diagnosis was Diabetic Nephropatia, Renal polycystic chronic pyelonephritis, Glomerulonephritis, chronic urolithiasis, obstructive uropathy, and post renal transplant. As risk factor was evaluated patients second diagnosis in which were DM Mellitus diabetes second Anemia, HCV, and HBsAg positive multiple myeloma, Nephrectomia, and Pulmonary carcinoma. HTA was found in 99% of the patients

RESULTS

We applied a correlation Matrix to better evaluate the influence of each observed factor. Patients enrolled according to primary and second diagnosis, age, sex, HTA, DM, and period in hemodialysis treatment. Kt/V (fractional urea clearance) and URR (urea reduction ratio), EF (ejection fraction) types of access in hemodialysis.IL 6 and CRP had a correlation factor of (P = 0.4) according to the primary diagnosis. Age, had a (P = 0.2) factor and sex (P = 0.1) factor. There was no positive correlation between IL6 to Kt/V and URR, they had respectively a (P = -0.1) correlation factor. While CRP to Kt/V and URR had respectively (P = -0.4) and (P = -0.5) correlation factors. Meanwhile, correlations among IL 6 CRP and albuminemia total protein EF were minimal. IL-6 cytokine and CRP results were obtained with Roche Diagnostics testing with Cobas e 411 and COBAS INTEGRA 400.

CONCLUSIONS

Interleukin-6 (IL-6) and C-reactive protein (CRP) were separately related to clinical factors. IL6 was found to be the more significant biomarker to morbidity in chronic patients.

T129

COMPARISON OF MDRD VS CKDEPI EQUATIONS FOR CALCULATION OF EGFR USING CREATININE BY JAFFE VS ENZYMATIC ASSAYS AMONG OUTPATIENTS PRESENTING TO A TEACHING HOSPITAL IN SRI LANKA

U. Senarathne ¹, B. Dayanath ²

BACKGROUND-AIM

Estimated glomerular filtration rate (eGFR) based on serum creatinine is widely applied for chronic kidney disease (CKD) classification in place of creatinine clearance. The enzymatic assay has fewer interferences compared to the Jaffe method producing more reliable creatinine measurements. This study aimed to compare the performance of MDRD and CKDepi equations on CKD-classification in Sri Lankan patients when using creatinine by Jaffe vs Enzymatic assays.

METHODS

A descriptive cross-sectional study was conducted using 80 serum samples from specimens received for creatinine measurement from outpatients presenting to a teaching hospital laboratory in Western province, Sri Lanka. Serum creatinine was measured by both assays, and paired t-test was used to compare the eGFR values calculated by the two equations using creatinine by both assay methods.

RESULTS

The mean creatinine value by the Jaffe method was 76.2 µmol/L (SD=68, range: 14.7-396.4) and 96.4 µmol/L (SD=78.7, range: 35.8-499.9) by enzymatic assay. The mean eGFR values were 127 mL/ min/ 1.73 m² (SD=85.9) by MDRD and 97.7 mL/ min/ 1.73 m² (SD=34.5) by CKDepi for creatinine by Jaffe method; 84.1 mL/ min/ 1.73 m² (SD=36.2) by MDRD and 83.3 mL/ min/ 1.73m² (SD=30.4) by CKDepi for creatinine by enzymatic assay. MDRD equation overestimated the eGFR compared to CKDepi, irrespective of the creatinine assay (p<0.001), and creatinine by Jaffe method overestimated eGFR compared to enzymatic assay irrespective of the equation used for eGFR calculation (p<0.001). eGFRs calculated by MDRD and CKDepi equations using creatinine by enzymatic assay had no statistically significant difference (p=0.628). Using CKDepi and creatinine by the enzymatic assay as the reference standard for eGFR calculation, 20% of patients were misclassified to a lower CKD-stage when eGFR was calculated by MDRD equation with creatinine by Jaffe method.

CONCLUSIONS

Higher eGFR observed with both MDRD and CKDepi equations when calculated using creatinine by Jaffe method indicates the risk of overestimating eGFR by Jaffe assay due to possible negative interferences. In addition, the misclassification of CKD stages due to shortcomings of the analytical method and the applied equation can adversely affect patient care.

¹Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura, Nugegoda.

²Department of Chemical Pathology, Colombo North Teaching Hospital, Ragama.

T130

METABOLIC PROFILING STUDY IN SERUM OF PATIENTS WITH POLYCYSTIC KIDNEY DISEASE AND CHRONIC KIDNEY DISEASE BASED ON 1 H NMR SPECTROSCOPY

<u>F. Koktasoglu</u>¹, A.Z. Gul ¹, M. Demirel ¹, Ö. Ariş ², Ö.C. Elçioğlu ², Ş. Selek ¹

BACKGROUND-AIM

Polycystic kidney disease (PKD) is an inherited disease caused by mutations in the genes of the cells that form the renal tubules. Chronic kidney disease is based on the presence of kidney damage or decreased kidney function lasting longer than 3 months. NMR (nuclear magnetic resonance)-based metabolomics studies provide a powerful resource for clinical research and medical applications. In this study, we aimed to perform NMR-based metabolite profiling analysis from the serum of patients with PKD and healthy volunteers. To investigate the specifics of metabolic profiling, patients who had developed CKD for various reasons were also included. To extend the study, we planned to evaluate amino acids from sera using liquid chromatography with tandem mass spectrometry (LC-MS/MS) analysis.

METHODS

1D NOESY ¹H-NMR (proton NMR) spectra and LC-MS/MS analysis from the sera of 39 patients with unimpaired renal function with polycystic kidney (PK), 30 patients with polycystic kidney disease (PKD), 40 healthy subjects and 28 CKD patients were evaluated and multivariate analyses were performed. Continuous variables were compared with the Kruskal-Wallis test.

RESULTS

NMR spectra and subsequent multivariate analysis showed that all study groups had different fingerprints for 10 endogenous metabolites and amino acids. The resulting metabolic profiles showed significantly decreased plasma levels of betaine (r:-0.264) and 3-hydroxyisovalerate (-0.334) in all patient groups. In addition, the levels of 2-hydroxyvalerate (r:0.574) and N-acetylglucosamine (r:-0.505) were significantly increased in the PKD group. These changes were also probably associated with complicated renal failure in PK. Interestingly, the metabolite guanidoacetate (r:-0.404), the amino acids N-methylhistidine (r:-0.292), homocysteine (-0.423) and homocystine (r:-0.289) were found only in the plasma of PK patients. Serum levels of 2-hydroxyisovalerate (-0.419) and choline (-0.417) of patients showed an opposite trend with renal functions, and identically low eGFR was observed in the groups with developed CKD.

CONCLUSIONS

Taken together, the observed changes in plasma metabolites and amino acids quantified by NMR and LC-MS/MS provide evidence of impaired metabolism in CKD and PKD even in the early phase.

 $^{^{1}}$ Department of Medical Biochemistry, Bezmialem Vakif University Faculty of Medicine, Istanbul, Turkey

²Department of Nephrology, Bezmialem Vakif University Faculty of Medicine, Istanbul, Turkey

T131

STUDY OF KIDNEY DISEASE IN A SPANISH COHORT OF HIV PATIENTS AFTER FIVE YEARS OF FOLLOW UP

R.M. Fernández¹, J.M. Miró¹, F. Cofàn¹, C. Ruiz¹, J. Laguna¹, A. Moreno¹, J.C. Trullas², L. Macias¹, J. Bedini¹, N. Rico¹ Hospital Clinic, Barcelona² Salut Interna S.L.: Olot, Girona, ES

BACKGROUND-AIM

Currently 37 million people are living with HIV infection and more than 2 million new infections are diagnosed annually. The increase in longevity and the antiretroviral therapy itself, has increased the appearance of other comorbidities associated with HIV, stands out chronic kidney disease (CKD), which is one of the main causes of mortality in these patients.

The Kidney Disease: Improving Global Outcomes (KDIGO) define CKD as a glomerular filtration rate (GFR) <60 mL/min/1.73 m2 for 3 months or more, and classified CKD in five stages according of kidney damage:

- Stage 1 (Kidney damage with normal kidney function): ≥90 mL/min
- Stage 2 (Kidney damage with mild loss of kidney function): 60-89 mL/min
- Stage 3a (mild to moderate loss of kidney function): 45-59 mL/min
- Stage 3b (moderate to severe loss of kidney function): 30-44 mL/min
- · Stage 4 (severe loss of kidney function): 15-29 mL/min
- Stage 5 (kidney failure): <15 mL/min

Therefore, it can be assumed that patients with a milder impairment (stage 2) are those with more predisposition to develop a CKD and eventually end-stage kidney disease.

In this context, the aim of the present work is known the evolution of kidney disease in a Spanish cohort of HIV positive patients after five years of follow-up, focus on patients in stage 1 and 2.

METHODS

Retrospective observational study of kidney function in a cohort of 3324 HIV-positive patients followed from December 2014 to December 2019.

We classified this cohort in 2014 and 2019 according to the GFR. Consecutively we estimated, for each stage, the percentage of patients who evolved to other stages after five years of follow-up.

RESULTS

In 2014, 2405 patients (72%) were classified in stage 1, 825 (25%) in stage 2, 65 (2%) in stage 3a, 20 (0,6%) in stage 3b, 5 (0,15%) in stage 4 and 4 (0,12%) in stage 5. In 2019, 1398 patients (42%) were classified in stage 1, 1662 (50%) in stage 2, 192 (5,8%) in stage 3a, 52 (1,6%) in stage 3b, 13 (0,4%) in stage 4 and 7 (0,2%) in stage 5.

After five years of follow up, 1043 patients out of 2405 (43%) progressed from stage 1 to stage 2 and 27 out of 2405 (1%) from stage 1 to stages already diagnosed as CKD (stage 3a, 3b, 4 and 5). In the group of patients from stage 2, 156 out of 825 (19%) progressed to stages diagnosed as CKD.

CONCLUSIONS

In our Spanish cohort of 3324 HIV-positive patients we observed that after 5 years of follow up a 43 % of patients without kidney disease evolved to a mild renal impairment and a 19 % from mild renal impairment to CKD. The results confirm the importance of identifying, in early stages, those patients with a predisposition to develop kidney disease. Recognizing this population could help the clinicians to implement renoprotection strategies.

T132

IMPLEMENTATION OF ELECTRONIC ALERT SYSTEM FOR EARLY DIAGNOSIS OF ACUTE KIDNEY INJURY

U. Parekh ¹, B. Das ¹

¹Kokilaben Dhirubhai Ambani Hospital & Medical Research Institute

BACKGROUND-AIM

This study is the first attempt to create and implement an alert system to facilitate early diagnosis and timely intervention for management of Acute Kidney Injury in India. An algorithm was created to retrospectively track rise in serum creatinine (SCr) as per the KDIGO guidelines.

METHODS

Participants >18 years of age with a baseline SCr <4 mg/dl were included. Clinical history, including 53 features associated with AKI, were recorded and statistical analyses were performed.

RESULTS

With excellent sensitivity (99.53%), specificity (98.60%), and diagnostic accuracy (Youden's index 0.98), true positive alerts were generated for 214 of 4439 patients. 75.2% patients were critically-ill, with primary diagnosis of cardiac, pulmonary and nephrological events and co-morbidities such as hypertension, diabetes mellitus and CKD. Only 40.2% patients had a documented clinical diagnosis of AKI. The overall in-hospital mortality rate was 21%. Sub-group analysis revealed worse outcomes in stage 3 AKI patients. De-novo AKI patients had a higher risk of death compared to AKI on CKD patients.

CONCLUSIONS

In our study, we saw an increased burden in patient outcomes owing to low diagnosis rate of AKI. It is imperative that we implement the alert system in real-time to assist physicians in early diagnosis of AKI.

T133

INTERLEUKINS 1, 6 AND 18 AS MARKERS OF CHRONIC KIDNEY DAMAGE IN ANTIRETROVIRAL-NAïVE AND ANTIRETROVIRAL-TREATED PATIENTS WITH HIV/AIDS

T. Adedeji³, N. Adedeji⁵, K. Ajeigbe³, S. Adebisi¹, M. Fawale⁴, O. Jeje², O. Smith², O. Ajose³

BACKGROUND-AIM

: Interleukins-1, -6 and -18 have been reported as biomarkers of kidney injury or predictors of kidney dysfunction outcomes. We evaluated the relationships between these 3 cytokines and estimated glomerular filtration rate (eGFR) in Antiretroviral-naïve and Antiretroviral-treated Patients with HIV/AIDS

METHODS

Serum interleukins-1, -6 and -18 were assayed using High Performance Liquid Chromatography (HPLC). Creatinine in serum was determined by modified Jaffe-kinetic method with calibration traceable to isotope dilution mass spectrometry (IDMS). Creatinine values were used to determine eGFR by CKD-EPIcr equation (2009)

RESULTS

One hundred and eighty-one subjects (86 ART-naïve and 95 ART-treated) were evaluated. Overall, with respect to eGFR values, 85 (47%) subjects: 39 (21.5%) naïve and 46 (25.4%) treated had stage 1 CKD (eGFR: ≥90ml/min/1.73m2); 65 (35.9%): 30 (16.6%) ART-naïve and 35 (19.3%) treated subjects had stage 2 CKD (eGFR: 60 -89ml/min/1.73m2); 29 (16%): 15(8.3%) naïve and 14 (7.7%) treated had stage 3 CKD (eGFR: 30-59ml/min/1.73m2); only 2 (1.1%), both naïve, had stage 4 CKD (eGFR: 15 - 29ml/min/1.73m2); none had stage 5 CKD (eGFR: <15ml/min/1.73m2).

The overall mean eGFR was 91.39 ± 32.38 ml/min/1.73m2, there was no significant difference in mean eGFR between the naïve (90.77 ± 30.59 ml/min/1.73m2) and treated (91.97 ± 33.99 ml/min/1.73m2) subjects, p=0.81.The overall mean IL-1, IL-6 and IL-18 was 0.36 ± 0.08 pg/ml, 0.68 ± 0.05 pg/ml, and 1.06 ± 0.14 pg/ml respectively. The mean IL-1, IL-6, and IL-18 were significantly higher in the naïve than the treated subjects (0.37 ± 0.07 versus 0.33 ± 0.08 pg/ml, p=0.006; 0.69 ± 0.05 versus 0.66 ± 0.04 pg/ml, p=0.005; 1.09 ± 0.13 versus 1.03 ± 0.14 pg/ml, p=0.005 respectively)

There were no significant differences in mean interleukin levels among subjects with CKD stages 1, 2, and 3 (i.e IL-1: 0.36 ± 0.08 pg/ml, 0.35 ± 0.09 pg/ml, and 0.35 ± 0.08 pg/ml respectively; IL-6: 0.68 ± 0.05 pg/ml, 0.68 ± 0.05 pg/ml, 0.68 ± 0.05 pg/ml, 0.68 ± 0.06 pg/ml respectively; IL-18: 1.06 ± 0.15 pg/ml, 1.06 ± 0.13 pg/ml, 1.05 ± 0.16 pg/ml respectively). However, mean interleukin levels among subjects with stage 4 CKD were higher than those with stages 1, 2, and 3 CKD, viz: IL-1 (0.41 ± 0.03 pg/ml versus 0.36 ± 0.09 pg/ml); IL-6 (0.72 ± 0.02 pg/ml versus 0.68 ± 0.06 pg/ml); and IL-18 (1.20 ± 0.05 pg/ml versus 1.05 ± 0.12 pg/ml).

There was no significant correlation between eGFR and any of the interleukins (r= -0.005, p= 0.943, r= -0.006, p=0.937, r= -0.005, p=0.942 for IL-1, IL-6, and IL-18 respectively). However, there were very strong correlations between interleukins pairs: r=1.0, p <0.0001 for IL-1 and IL-6, IL-1 and IL-18, IL-6 and IL-18 respectively.

CONCLUSIONS

HIV infection induces cytokine production which likely contributes to renal impairment, while HAART suppresses systemic cytokine levels, thereby improving the HIV-induced renal dysfunction. Serum interleukins-1, -6, and -18 are higher in moderate-to-severe HIV-induced renal dysfunction (> stage 3 CKD) than in the mild-to-moderate stages (stage 1-3 CKD), implying cytokines possibly contribute to the magnitude and progression of chronic renal dysfunction. Interleukins-1, -6 and -18 appear not to be useful biomarkers of early stages of progressive renal impairment but late CKD.

¹Department of Chemical Pathology, Benue State University, Makurdi, Benue State, Nigeria

²Department of Chemical Pathology, Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun State, Nigeria

³Department of Chemical Pathology, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria

⁴Department of Medicine, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria

⁵Department of Obstetrics and Gynaecology, Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun State, Nigeria

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URIC ACID AND CARDIOVASCULAR MORBIDITY IN HEMODIALYSIS PATIENTS

A.S.M.R. Radovic; Ignjatovic; Stosovic; Naumovic

¹University Clinical Center of Serbia, Belgrade, Serbia

BACKGROUND-AIM

It is well known that hyperuricemia is widespread among patients with the end-stage of renal disease (ESRD). Due to the dominant renal clearance of uric acid, it is difficult to clarify that extent hyperuricemia is responsible for the onset and progression of CKD and cardiovascular complications, and how much its elevated concentration reflects a decreased renal function

METHODS

: The study was carried out in a group of 110 patients on a chronic hemodialysis program. Clinical and biochemical parameters of importance for this study were evaluated in the period from October 2011 to October 2017. We determined the following biomarkers: glucose, urea, creatinine, estimated glomerular filtration rate according to the MDRD formula (eGFR, MDRD), albumin, total cholesterol, HDL cholesterol, LDL cholesterol, triglycerides, calcium, inorganic phosphate, C-reactive protein, natriuretic peptide type B (BNP), amino-terminal pro-natriuretic peptide type B (NT-proBNP), and intact parathyroid hormone (iPTH). In addition to demographic parameters (age, sex) the following clinical parameters were monitored: body mass index (BMI), mean arterial blood pressure, secondary hypertension, diabetes, acute coronary syndromes, chronic ischemic myocardiopathy, drug use (allopurinol, antihypertensives and statins).

RESULTS

The study was carried out in a group of 110 patients on a chronic hemodialysis program. Clinical and biochemical parameters of importance for this study were evaluated in the period from October 2011 to October 2017. We determined the following biomarkers: glucose, urea, creatinine, estimated glomerular filtration rate according to the MDRD formula (eGFR, MDRD), albumin, total cholesterol, HDL cholesterol, LDL cholesterol, triglycerides, calcium, inorganic phosphate, C-reactive protein, natriuretic peptide type B (BNP), amino-terminal pro-natriuretic peptide type B (NT-proBNP), and intact parathyroid hormone (iPTH). In addition to demographic parameters (age, sex) the following clinical parameters were monitored: body mass index (BMI), mean arterial blood pressure, secondary hypertension, diabetes, acute coronary syndromes, chronic ischemic myocardiopathy, drug use (allopurinol, antihypertensives and statins).

CONCLUSIONS

There was no statistically significant correlation between uric acid concentration and cardiovascular complications in the development of renovascular hypertension, secondary diabetes, acute coronary syndrome (ACS), and chronic ischemic myocardiopathy, so that, according to the results of this study, uric acid could not be considered as a cardiovascular risk factor in hemodialysis patients.