EPIDEMIOLOGY - RENAL OUTCOMES

SP200

TABUK FORMULA: A MODIFIED CKD-EPI FORMULA IMPROVES PREDICTING GFR IN SAUDI POPULATION

Osama El Minshawy1, Tawfik Ghabrah1, Abdelmageed Hamza3, Abdelhafeez Fadl3, Mohalab Adam3 and Eman El Bassuoni4

Introduction and Aims: Tabuk people has lower body mass index (BMI) and body surface area (BSA) than U.S. CKD-EPI formula was developed for estimation of GFR in Americans, but its accuracy in Tabuk people indicated adjustment of this formula is crucial. Aim: To adjust CKD-EPI formula and compare performance of tailored CKD-EPI formula (Tabuk formula) with the original CKD-EPI using isotopic GFR (iGFR) as a reference.

Methods: The study included 226 person, 69 diabetics; males 141, age 47±12 years, body weight 65±7 Kg, BSA 1.7±0.1 m², BMI 34±15 mg/dl, iGFR 41±22 ml/min/1.73m². As BMI in data provided by CKD-EPI collaborators (28±6 kg/m²) is very high than BMI of Tabuk people (23±3 kg/m²). So, we assumed accuracy of CKD-EPI formula may be improved by adding a corrective factor that is extracted from BMI of Tabuk people. So our suggested formula: eGFR (ml/min/1.73m²) = (CKD-EPI) X (BMI)²

Results: Tabuk formula gave the best performance as illustrated in tables below, considering error range between ±10%, ±30% and ±50%. Also, analysis by r² showed it is the best one for Tabuk people.

Conclusions: Tabuk formula represents a better estimation of GFR than original CKD-EPI and other published formulae so; it is the best one for monitoring kidney functions and could be applied in clinical practice in Tabuk area.

SP200 Table 1. iGFR and eGFR by Tabuk formula and other formulae

<table>
<thead>
<tr>
<th>Formula</th>
<th>Mean</th>
<th>Range</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tabuk formula</td>
<td>43±23</td>
<td>7-120</td>
<td>39</td>
</tr>
<tr>
<td>CKD-EPI</td>
<td>44±22</td>
<td>8-124</td>
<td>40</td>
</tr>
<tr>
<td>eGFR</td>
<td>39±16</td>
<td>7-113</td>
<td>35</td>
</tr>
<tr>
<td>MDRD</td>
<td>40±18</td>
<td>8-116</td>
<td>37</td>
</tr>
<tr>
<td>Walser</td>
<td>37±17</td>
<td>3-97</td>
<td>3-97</td>
</tr>
<tr>
<td>Mayo Clinic</td>
<td>48±26</td>
<td>10-145</td>
<td>41</td>
</tr>
<tr>
<td>Nankivell</td>
<td>50±17</td>
<td>13-116</td>
<td>47</td>
</tr>
<tr>
<td>Cockcroft-Gault</td>
<td>52±21</td>
<td>13-140</td>
<td>47</td>
</tr>
</tbody>
</table>

SP200 Table 2. % of prediction error in all formulae

<table>
<thead>
<tr>
<th>Formula</th>
<th>within 10%</th>
<th>within ±30%</th>
<th>within ±50%</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tabuk formula</td>
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<td>78</td>
<td>91</td>
<td>0.73</td>
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<tr>
<td>CKD-EPI</td>
<td>44</td>
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<td>77</td>
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<tr>
<td>MDRD</td>
<td>20</td>
<td>51</td>
<td>71</td>
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<td>Walser</td>
<td>19</td>
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<td>78</td>
<td>0.58</td>
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<td>Mayo Clinic</td>
<td>18</td>
<td>47</td>
<td>61</td>
<td>0.56</td>
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<td>Nankivell</td>
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<td>37</td>
<td>63</td>
<td>0.57</td>
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<tr>
<td>Cockcroft-Gault</td>
<td>15</td>
<td>35</td>
<td>49</td>
<td>0.56</td>
</tr>
</tbody>
</table>

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Conclusions: This prospective cohort of referred CKD patients likely typifies patterns of progression in US nephrology practices and identifies important modifiable risk factors for CKD progression and the outcome of ESRD.

SP202
STUDY DESIGN OF THE NETWORK OF GERMAN KIDNEY COHORTS

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Introduction and Aims: To expedite research in the field of chronic kidney disease (CKD), large scale, prospective, observational cohort studies with detailed phenotyping and long-term follow-up are mandatory and have the potential to generate novel hypotheses for future intervention trials. We report on the formation of a network of 5 cohorts comprising relevant patient subgroups including all age-groups, stages of CKD, overt proteinuria and comorbidities (diabetes mellitus and cardiovascular disease).

Methods: This initiative aims to conduct joint analyses of five prospective observational studies in the renal field (BIS, Berlin Initiative Study; CAD-REF, Coronary Artery Disease-Renal Failure-Registry; DIACORE, Diabetes Cohort; GCKD, German Chronic Kidney Disease Study and 4C, Cardiovascular Comorbidity in Coronary Artery Disease-Renal Failure-Registry; DIACORE, Diabetes Cohort; GCKD, German Chronic Kidney Disease Study and 4C, Cardiovascular Comorbidity in Children with CKD Study). To this end, prior to study start, 4 of the 5 prospective study cohorts defined core variables to be obtained by uniform data capturing. This includes analogue patient questionnaires, concordant standards for clinical measurements, a core laboratory for predefined blood and urine analyses and central event adjudication.

Conclusions: The network and external collaborators.

EGFR FORMULAE ARE OF NO CLINICAL UTILITY COMPARED TO ACCURATE MEASUREMENT OF TRUE GFR FOR HEALTHY PROSPECTIVE LIVING KIDNEY DONORS

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Introduction and Aims: Accurate measurement of GFR is useful in many different clinical settings. Estimated GFR (eGFR) measurements, derived from manipulations of plasma creatinine concentrations in different ways, have become the cornerstone for screening for chronic kidney disease (but not without some controversy). Measured GFRs (mGFR) are done in fewer situations, but one still extant is the accurate measurement of renal function in people potentially able to donate a kidney. We wanted to see the level of agreement between three commonly-used formulae for eGFR and the mGFR in this group.

Methods: 508 people were evaluated between 2008 and 2012 for potential kidney donation by undertaking mGFR. mGFR was derived from 51Cr-EDTA clearance using blood samples taken at 2, 3 and 4 hours. The slope-intercept GFR was corrected for body surface area (BSA) using the Haycock formula and for the fast exponential using the Cockroft-Mortensen equation. For each person with an mGFR and a contemporary plasma creatinine value we calculated the Cockcroft-Gault creatinine clearance, the 4-variable MDRD eGFR, and the CKD-Epi eGFR. We then explored the relationships between these derived variables.

Results: The mean mGFR for this population was 92.0 +/- 14.1 ml/min (range 38.6 - 166.7). Age range was 21 to 84. Racial / gender distribution was thus: White Female: 205; White Male: 193; Black Female: 32; Black Male: 28; Others Female: 27; Others Male: 22. Pearson correlation coefficients were poor between mgFR and MDRD eGFR (r=0.53), CG (r=0.54) and CKD-Epi (r=0.62). All very significant statistically, but Bland-Altman plots showed very substantial bias: mGFR to MDRD bias -0.14 (SD 166.7). Age range was 21 to 84. Racial / gender distribution was thus: White Female: 205; White Male: 193; Black Female: 32; Black Male: 28; Others Female: 27; Others Male: 22. Pearson correlation coefficients were poor between mgFR and MDRD eGFR (r=0.53), CG (r=0.54) and CKD-Epi (r=0.62). All very significant statistically, but Bland-Altman plots showed very substantial bias: mGFR to MDRD bias -0.14 (SD 15.9), 95% limits -31 to +31 ml/min. mGFR to CG bias 21.3 (23.7), -25 to +67 ml/min. mGFR to CKD-Epi bias 12.2 (19.3), -25 to +50 ml/min.

Conclusions: The level of agreement between mgFR and all three sets of eGFR values was poor and thus eGFR was of no clinical utility in this setting. MDRD eGFR fared least badly under these circumstances. Use of mgFR of course remains an essential safeguard to ensure appropriate donation.

SP204
DIAGNOSIS AND REFERRAL PATTERNS OF CHRONIC KIDNEY DISEASE PATIENTS IN 4 EUROPEAN COUNTRIES

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Introduction and Aims: Chronic kidney disease (CKD) is an irreversible and progressive disease and can lead to kidney failure (end-stage renal disease). Despite its prevalence, some physicians may be unfamiliar with the diagnosis and initial treatment of CKD. The Kidney Disease: Improving Global Outcomes (KDIGO) initiative developed goals: to distinguish CKD at its earliest stage; and understand what measures can be used to prevent its progression and associated complications. The objective of this research is to investigate the standard of care in CKD management including diagnosis, monitoring, co-management and referral patterns.

Methods: Data were drawn from the Adelphi Chronic Kidney Disease Specific Programme (DSP) conducted between September and December 2012. The DSP is an independent, real world, cross-sectional/retrospective multinational survey. The data reflect current clinical practice, current symptoms, prevalence, and severity; physician and patient perspectives on CKD progression; and health status and its effect on patients’ daily/ working lives. Data were collected in France, Germany, Spain, and the UK via i) nephrologist and endocrinologist interviews, ii) patient record forms (PRFs) completed by participating physicians, and iii) matched patient self-completion forms. Eligible physicians provided detailed information for 8 consecutive patients who agreed to participate with CKD stage 3, stage 4 or stage 5 not on dialysis and 4 stage 5 patients on dialysis.

Results: A total of 177 physicians participated, of which 157 were nephrologists and 107 were hospital-based. 95% of physicians indicated that MDRD (modification of diet in renal disease) was the most common method used to estimate GFR (glomerular filtration rate). Physicians estimated that of the patients they had managed in the previous 4 weeks, 8.1% were diagnosed at stage 1, 11.9% at stage 2, 22.1% at stage 3a, 21.6% at stage 3b, 20.7% at stage 4 and 15.7% at stage 5. Physicians indicated that 49.2% of their patients were referred by their PCP/family doctor, 14.7% by an
endocrinologist and 14.3% by a nephrologist. 6.1 % of patients were referred to the nephrologist at stage 1, 10.5 % at stage 2, 20.1 % at stage 3a, 25.2 % at stage 3b, 24.1 % at stage 4 and 13.8 % at stage 5. 48% of nephrologists suggested that patients should be referred when they reach stage 3. Physicians indicated that 39.2 % of the underlying cause of CKD was T2DM, 38.7% hypertension and 22% CV disease. 19% of physicians indicated that the usually discontinues angiotensin-converting enzyme inhibitor or angiotensin receptor blocker therapy to raise the GFR to a patient near dialysis.

Conclusions: These findings indicate that while timely access to nephrologist and endocrinologist services are important for CKD patients, many are still being referred late to a specialist - in this analysis four out of ten are referred at Stage 4 or 5.

Methods: Total of 4431 check-ups from the 1947 enrolled participants between August 2006 and December 2012 (Mean age, 55.8 ± 16.5 years; male : female, 846 : 1101). Of them, 2324 cases could be analyzed for one year changes of eGFR and ACR. The prevalence of CKD was analyzed with the results of the first check-up CKD was defined with positive urine ACR (= or > 30 mg/gCr) and/or decreased eGFR (<60 ml/min) using Japanese equation because of the racial composition in Japanese population.

Results: eGFR prevalence was 26.5% at the first check-up. Univariate analysis demonstrated that the history of DM (odds ratio (OR) 2.08, 95% CI 1.64 - 2.63), history of HTN (OR 4.46, 95%CI 3.58 - 5.56), history of cardiovascular disease (OR 2.08, 95% CI 1.63 - 2.66), older than 60 years of age (OR 4.88, 95%CI 3.92 - 6.09), obesity (OR 1.68, 95% CI 1.36 - 2.08), higher blood pressure and higher BMI without DM or >130/85 mmHg in participants with DM, 2.40, 95% CI 1.96 - 2.96, were the significant risk factors for the prevalence of CKD. On the other hand, smoking, alcohol intake, having stress, daily exercise were not the significant risk factors for the prevalence of CKD. By yearly check-up, eGFR significantly declined with 0.6 ml/min/1.73m² (0.4%) per year but ACR did not significantly change. The decline of eGFR was significantly higher among participants who walked everyday more than 60 min (mean decline in eGFR: 1.25 ml/min/1.73m² vs. 0.52), and those who did not have a family doctor (1.14 ml/min/1.73m² vs. 0.44). Less in weight tended to prevent the decline in eGFR (0.17 ml/min/1.73m² vs. 0.66). Furthermore, present smoking and alcohol intake may be a risk factor for the decline in eGFR (1.06 ml/min/1.73m² vs. 0.55 vs. 0.68 vs. 0.46, respectively).

Conclusions: It is demonstrated that obesity and high blood pressure are risk factors for prevalence of CKD. The correlations of lifestyle, especially the loss in weight, stopping smoking and alcohol intake and visiting family doctor are important for the prevention of decline in eGFR. However, too much exercise may accelerate the decline in eGFR among high risk population of CKD.

Methods: Serum creatinine was measured by the IDMS traceable compensated Jaffe method (Roche Diagnostics, Mannheim, Germany) on Modular apparatus. Cystatin C was measured by a particle-enhanced nephelometric immunoassay (PENIA) on the BNII nephelometer (Siemens Healthcare Diagnostics, Marburg, Germany).

Results: The population screened consisted of 4189 people (47% were men, mean age 63±6 years). The mean serum creatinine and plasma cystatin C levels were 0.88±0.21 mg/dl and 0.85±0.17 mg/L, respectively. The prevalence of CKD in this population using the MDRD, the CKD-EPI, the CKD-EPI-Cys and the CKD-EPI mix equations was 13%, 9.8%, 4.7% and 5%, respectively. The prevalence of CKD is significantly higher with the creatinine-based (MDRD and the CKD-EPI) equations compared to the new cystatin C-based equations.

Conclusions: The present study has illustrated large discrepancies for the prevalence of CKD according to the biomarker used to estimate the GFR. Moving from strictly creatinine-based equations (MDRD or CKD-EPI) to cystatin C-based equations will decrease prevalence of CKD by half, which is highly significant from an epidemiological point of view. Additional studies are thus necessary before asserting we know the true prevalence of CKD in the general population.
Early death, disability, poor quality of life, and high economic costs. Attention to...
Evaluating Patients about Dialysis Modality Options: Lack of Evidence over What Determines Effective Education Systems

Introduction and Aims: EDTA Best Practice Guidelines recommend that all patients should receive education about dialysis options in a structured program which covers all dialysis modalities. However, many patients do not receive such education and home dialysis use remains substantially lower than in-centre-dialysis in many countries. This study aimed to perform a literature review on the effect of dialysis options education on the patient's modality choice, and more importantly, to identify effective educational methods and approaches.

Methods: PubMed literature searches (01/01/95-08/10/12) with main search terms pre-dialysis, peritoneal dialysis, home dialysis, education, information and decision were performed. 94 of 884 articles returning from the initial search had full text review as they potentially met inclusion criteria (adults, predialysis or dialysis patients, details of education system included). In addition, web search engines were used to examine grey literature e.g. guidelines or experimental reports from CKD clinics. Articles were classified by study design and a detailed examination of educational process and outcomes performed.

Results: Only 30 out of the 94 studies met inclusion criteria - 21 with quasi-experimental design or observational studies, and 9 non-experimental (e.g. narrative review) studies. There were numerous methodological issues – lack of control group, no description of final dialysis choice and lack of detail of the educational process and content. 11 studies presented dialysis modality choice data and all showed an increase in home dialysis choice vs control group or historical values. Descriptions of the educational process varied and included individual patient and group education, multidisciplinary intervention, varying duration and frequency of sessions, and variation in the roles of the educators (e.g. nurse as case manager). One of the few studies with a strong design, a randomized trial, showed that problem solving group sessions are an effective component of an educational programme for enhancing the proportion of home-dialysis choice. The educational techniques and the required educator competencies are considered relevant for effectiveness although poorly defined or studied. There is some evidence from a study in which adult learning methods were compared with conventional learning methods - the former resulting in a more effective programme (e.g. less infections, better compliance). Timing of education was seen as important but the studies did not allow firm conclusions to be reached over timing of this start.

Conclusions: Educating patients about dialysis options is important to allow informed decision making but clinical evidence is lacking concerning effective educational methods and staff competencies. There is a need for a standardized approach built on best evidence (also from other clinical conditions) and existing knowledge on the evaluation of complex interventions to ensure good clinical outcomes and allow comparison between units as well as to formally test new educational interventions.

RhoShaped Association Between Body Mass Index and Proteinuria in a Large Japanese General Population Sample

Introduction and Aims: There is little data on the association of body mass index with proteinuria.

Methods: This was a cross-sectional cohort study assessing the association of BMI with proteinuria in a large Japanese population. Using a nationwide health check-up database of 212,251 Japanese aged ≥20 years with no pre-existing cardiovascular diseases (185,183 men, median age 66 years; 127,068 women, median age 65 years), we examined the association between BMI and proteinuria (≥1+ on dipstick).

Results: Subjects were divided into 11 subgroups by BMI grading in 1 kg/m² intervals from 18.5 to 27.5 kg/m². A BMI of around 22 +/- 0.5 kg/m² was considered optimal for Japanese; therefore, this subgroup was set as a reference when logistic analysis was applied. Age, waist circumference, height, weight, smoking and drinking habits, use of medications such as antihypertensives, antidiabetes, or antihyperlipidemic, proteinuria, eGFR, chemistry data, and blood pressure levels were significantly different between subgroups in both genders. The odds ratio for proteinuria showed a horseshoe shape in men and women, even after adjustment for significant covariates such as age, waist circumference, systolic blood pressure, eGFR, fasting plasma glucose, triglyceride, low-density lipoprotein, antihypertensive use, antidiabetic use, antihyperlipidemic use, and lifestyle factors (smoking and drinking). Gender differences were also prominent in that those with a BMI of less than 20.4 kg/m² were significantly associated with proteinuria in men, but a BMI of less than 18.4 kg/m² in women. On the other hand, BMI of 25.5 kg/m² was also significantly associated with proteinuria in men, but BMI of 22.5 kg/m² in women.

Conclusions: We found that BMI levels were associated with proteinuria in a horseshoe-shaped manner and showed marked gender differences. Health guidance should not only focus on higher-BMI subjects, but also the thinnest subjects, in terms of the prevention of chronic kidney disease.
SP215 A NOVEL APPROACH TO MANAGING CHRONIC KIDNEY DISEASE: REMOTE MONITORING

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1Renal Medicine Sheffield Teaching Hospitals Sheffield United Kingdom, 2Center for Sustainable Healthcare Oxford United Kingdom

Introduction and Aims: Chronic kidney disease (CKD) is common affecting 5-7% of worldwide & 5-10% of UK & 11.6% of US population with its frequency increasing with age. With an ageing population, the burden of CKD on the healthcare budgets, is increasing and therefore new sustainable service models are required to enable delivery of good quality care to CKD.

Aim: Evaluate the impact of a remote, community-based disease management program (DMP) for patients with advanced CKD on disease progression, patient satisfaction and environmental outcomes.

Methods: A pilot program was initiated between our hospital (tertiary referral centre) & our local Central Consortium of General Practitioners. All patients with CKD managed in secondary care were selected for the remote management program except i) those on immunosuppressive drugs and ii) those who were likely to need renal replacement therapy within the next 12 months. Patients had an individualized care plan generated by a consultant nephrologist specifying frequency of laboratory (lab) and blood pressure (BP) monitoring, thresholds for escalation of care with appropriate management plan. Laboratory and BP monitoring were performed at the local GP practice. Laboratory data was automatically uploaded to renal IT system whilst BP and clinical data were sent manually to secondary care. The nephrology outpatient consultation was replaced with a telephone consultation with a nurse specialist based at the tertiary centre. Clinical data was collated over 2 years before and 12 months after implementation of the DMP along with a patient satisfaction survey and travel data.

Results: There are currently 77 patients under remote management. There was no significant difference between the patients’ eGFR over 2 years before and 12 months after implementation of DMP, with their mean 28.7(95% CI, 28.27-29.14) & 28.5(95% CI, 28.14-28.86), respectively. The difference between BP before and after implementation of DMP was not significant. 90% of our survey respondents said they preferred receiving their kidney care in the community and felt more empowered about managing their CKD. The median distance travelled by patients to hospital was 5.4 miles whilst only 0.6 miles to their GP surgery, generating an annual carbon saving of 507 kg CO2 equivalent.

Conclusions: CKD is the 17th highest cause of disability worldwide, CKD progresses to ESRD in only about 0.15–0.2% of CKD III patients/year over 10–25 years. The financial cost of CKD care is huge, where Medicare reported expenditures on CKD patients in US to be more than $60 billion in 2007 versus $25 billion for ESRD – reflecting the formidable burden of CKD on the healthcare budgets, is increasing and therefore new sustainable service models are required to enable delivery of good quality care to CKD.

SP220 MEDICATION ADHERENCE IN PATIENTS WITH CHRONIC KIDNEY DISEASE IS IMPROVED BY CLINICAL DECISION SUPPORT SYSTEMS

Hilary Jo Plunkett, David E Shackley, Daniel Long, Patrick Ward, Anna Haines, and Ian McInnes

Introduction and Aims: Non-adherence to medications is a significant problem in chronic kidney disease (CKD). However, the effectiveness of any intervention to improve adherence has not been established.

Methods: Patients on peritoneal dialysis (PD) were randomized to either a computerized decision support system (DSS) or usual care. The DSS sent automated reminders to patients relating to their medications. In order to assess the impact of the intervention, the study compared medication adherence in patients on PD using a novel electronic medication event monitoring (MEM) system.

Results: In total, 37 patients were randomized to the intervention group and 35 to the control group. The adherence rate for medications was significantly higher in the intervention group (66% vs. 45%, P = 0.003). The improvement in adherence was most pronounced for the medications that had the highest adherence rates in the control group (78% vs. 57%, P = 0.001).

Conclusions: The DSS significantly improved medication adherence in patients on PD. The results of this study provide further evidence that the use of DSS can improve medication adherence in patients with CKD.

SP216 A MILD DECREASE IN RENAL FUNCTION WITHOUT EVIDENCE OF THROMBOTIC MICROANGIOPATHY IS COMMON IN CANCER PATIENTS RECEIVING SHORT-TERM GEMCITABINE TREATMENT

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Introduction and Aims: Gemcitabine (Gem) is a widely used nucleoside analog approved for treatment of several types of cancers. The development of thrombotic microangiopathy (TMA) has been documented in a small part of Gem recipients.

Methods: We studied inulin and paraaminohippuric acid clearance to evaluate renal function and renal plasma flow in 121 patients. We also measured the levels of urinary microalbuminuria and urinary megalin in patients with different GFRs.

Results: There were no significant differences in urinary albumin excretion among the patients with different GFRs. The level of urinary megalin was highly correlated with GFR in patients with non-nephrotic range GFR. However, the level of urinary megalin was decreased with decreasing GFR in patients with nephrotic stage.

Conclusions: The level of urinary megalin is a marker for the evaluation of renal function in patients with non-nephrotic range GFR.

SP217 GFR ESTIMATION BY URINARY SOLUBLE MEGALIN

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1Nephrology University of Tsukuba Tsukuba Ibaraki Japan, 2Clinical Nephrology and Rheumatology University of Nigata Chuk-U-nigata Japan

Introduction and Aims: Gemcitabine (Gem) is a widely used nucleoside analog approved for treatment of several types of cancers. The development of thrombotic microangiopathy (TMA) has been documented in a small part of Gem recipients.

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Conclusions: The level of urinary megalin is a marker for the evaluation of renal function in patients with non-nephrotic range GFR.

SP218 PROGRESSION OF CHRONIC KIDNEY DISEASE IN THE IRISH POPULATION: INITIAL FINDINGS FROM A NATIONAL SURVEILLANCE PROGRAMME

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Introduction and Aims: Early detection of chronic kidney disease (CKD) and subgroups who are most likely to progress to an essential part of preventive healthcare,
Introduction and Aims: Hyperuricemia, is highly prevalent in Chronic Kidney Disease (CKD) patients and is associated with cardiovascular (CV) outcomes and mortality. This study aims to analyze the relationship between baseline levels of serum uric acid (SUA) and CV outcomes and/or mortality in outpatients followed in Prevention of Progressive Renal Insufficiency program (PIRP), that collects prospectively data on patients attending nephrology ambulatories in the Emilia-Romagna region (Italy) since 2004.

Methods: Data are drawn from the PIRP registry and from regional mortality and hospital discharges registries. Study outcomes were: occurrence of non-fatal CV events, death due to CV acute events, combination of non-fatal CV events and death for CV events, all-cause death. SUA levels were grouped in tertiles. CV death was defined following ICD-10 or ICD-9 codes. CV events included: acute myocardial infarction, ischemic heart diseases and cerebrovascular diseases. Univariate and multiple logistic regression models were carried out to examine the relationship between tertiles of baseline SUA levels and each of the outcomes. Multivariate analyses were adjusted for age, gender, baseline CKD stage, allopurinol treatment, diabetes, cholesterol level, urine proteins, blood pressure, previous CV events.

Results: 1943 sample included 1049 patients. Mean age was 70.7±12.8 years, 65.6% males and baseline tertiles of SUA were: T1=1.5-5.6, T2=5.7-7.0, T3=7.1-13.8 mg/dl for males; T1=1.2-5.4, T2=5.5-6.8, T3=6.9-12.6 mg/dl for females. About one third of patients (36.5%) experienced non-fatal CV events, 37.1% combined outcome and 33.1% all-cause death. Patients in the third tertile of SUA had a significantly higher risk of non-fatal CV events and of combined outcome compared with patients in the first tertile. This relationship held both in univariate and multivariate analyses. No relationship was found between baseline SUA levels and all-cause mortality or mortality for CV acute events.

Conclusions: This study indicates that in CKD patients SUA levels exceeding 7 in males and 6.9 mg/dl in females are associated with a significantly higher risk of CV events but not with all-cause death.

SP220

BASELINE SERUM URIC ACID LEVELS AND CARDIOVASCULAR OUTCOMES IN PATIENTS WITH CKD

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Introduction and Aims: Renal biopsy procedure in patients with chronic renal failure (CRF) may represent a valid tool to help clinicians in clinical practice. However, the use of this invasive method in CRF is variable and it reflects the hospital biopsy policy.

Methods: To better define the CRF-related histological patterns and to assess the clinical utility of this procedure in this extensive group, we analyzed biopsy records of 1185 CRF patients living in a large North-Eastern Italian area from 1998 to 2010.

Results: Data analysis showed that, although the biopsy incidence rate and the histological features resulted unchanged, the mean age of our CRF patients increased during the study period (R=0.42, p<0.01). Primary and secondary glomerulonephritis (PGNs and SGNs) were the main histological presentations (53.9% and 23%, respectively). SGNs were over-diagnosed in female. Leading histological types were immunoglobulin A nephropathy (22%), focal segmental glomerulosclerosis (12.4%), membranous glomerulonephritis (MGN, 7.5%) and nephroangiosclerosis (7.3%). These forms were also highly frequent in CRF patients with elevated proteinuria and moderate/severe renal damage. Elderly were primarily affected by MGN. After biopsy, 49.5% of CRF patients with and 34.1% without nephritic syndrome received immunosuppression therapy.

Conclusions: This study demonstrated that renal biopsy in CRF patients, regardless age and GFR levels, is safe and essential to perform a correct diagnosis and to start a correct therapy. Additionally, it revealed that, even in patients with severe renal damage, it is possible to perform an accurate histological diagnosis and, interestingly, end stage kidney disease seems not to be the primary form.
SP222

TNF-RECEPTOR 2 PREDICTS RENAL OUTCOME IN MILD TO MODERATE CKD IN UNIVARIATE ANALYSIS

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Introduction and Aims: In two recent reports TNF receptor serum levels strongly predicted renal outcome in patients with type 1 and type 2. Of note, TNF receptor levels outperformed almost all established prediction markers and thus have been discussed as a new prognostic biomarker in diabetic nephropathy. However, diabetics are a selected high risk CKD population; thus the predictive utility of TNF receptors remains unknown in other CKD etiologies.

Methods: In the ongoing CARE FOR HOMe cohort study we recruited 444 CKD patients representing CKD stages 2-4 referred to a tertiary center. Unstable clinical status, active inflammatory processes or immunosuppression were exclusion criteria. TNFR2 levels were available in 435 / 444 patients, out of whom 48 patients had diabetic nephropathy. TNFR 2 was measured by ELISA, routine laboratory parameters were analysed by standard methods. GFR was estimated by MDRD equation and clinical parameters were recorded. Renal outcome was defined as halving of GFR, need for dialysis or death.

Results: At baseline TNFR 2 was very strongly correlated with GFR (r=0.710; p<0.001) and with albuminuria (r=0.337; p<0.001). Moreover, significant correlations with CRP (r=0.197; p<0.001) and age (r=0.197; p<0.001) were found. Patients with diabetic nephropathy had significantly higher TNFR 2 compared to patients with other etiologies (p=0.031). 55 patients experienced the end point; mean follow-up of the remaining was 2.3±1.6 years. In univariate Kaplan-Meier analysis TNFR 2 predicted renal outcome (p=0.001; cf Figure 1); in step-wise multivariate regression analysis TNFR 2 (p<0.001; ExpB=61.563) remained a predictor for renal outcome after adjustment for age, ARB and presence of diabetic nephropathy; however after further adjustment for GFR and albuminuria significance was lost (p=0.361).

Conclusions: In the present cohort of patients with mild to moderate CKD, TNF 2 predicted adverse renal outcome. Because of its strong co-linearity with eGFR, TNF 2 however did not confer additional prognostic information after adjustment for renal function.

SP223

SP223

ORAL ANTIDIABETIC THERAPY AND KIDNEY FUNCTION IN THE BERLIN INITIATIVE STUDY

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Introduction and Aims: Diabetes mellitus (DM) is a major cause of chronic kidney disease. Despite the high prevalence of DM in the elderly, data regarding the association of antidiabetic medication with kidney function (KF) in this specific population are scarce. The present study investigates the relationship between DM, oral antidiabetic drugs (OADs) and KF in people 70 years of age.

Methods: DM patients were participants of the Berlin Initiative Study (BIS). The BIS is a population-based cohort study which was initiated in 2009 in Berlin, Germany, in order to evaluate KF in 2070 participants ≥70 years. DM was defined as either

<table>
<thead>
<tr>
<th>Age (mean ± sd)</th>
<th>Total (N=334)</th>
<th>HbaA1c ≤ 7 (N=202)</th>
<th>HbaA1c &gt; 7 (N=132)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (N, %)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td>166 (53)</td>
<td>107 (53)</td>
<td>59 (53)</td>
</tr>
<tr>
<td>female</td>
<td>148 (47)</td>
<td>95 (47)</td>
<td>53 (47)</td>
</tr>
<tr>
<td>BMI (mean ± sd)</td>
<td>29.4 ± 4.5</td>
<td>29.3 ± 4.1</td>
<td>29.7 ± 5.3</td>
</tr>
<tr>
<td>eGFR (mean ± sd)</td>
<td>65.7 ± 17.8</td>
<td>63.9 ± 18.5</td>
<td>69 ± 15.8</td>
</tr>
<tr>
<td>Comorbidities (N, %)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- albuminuria (ACR &lt; 30mg/g creatinine)</td>
<td>122 (38.9)</td>
<td>69 (34.2)</td>
<td>53 (47.3)</td>
</tr>
<tr>
<td>- arterial hypertension</td>
<td>279 (88.9)</td>
<td>182 (90.1)</td>
<td>98 (87.5)</td>
</tr>
<tr>
<td>- myocardial infarction</td>
<td>48 (15.3)</td>
<td>33 (16.3)</td>
<td>15 (13.4)</td>
</tr>
<tr>
<td>- stroke</td>
<td>24 (7.6)</td>
<td>13 (6.4)</td>
<td>11 (9.8)</td>
</tr>
<tr>
<td>- coronary artery disease</td>
<td>69 (22)</td>
<td>50 (24.8)</td>
<td>19 (17.1)</td>
</tr>
</tbody>
</table>

HbaA1c > 6.5% or prescription of antidiabetic medication. Medication and comorbidities were assessed through personal interviews, clinical and laboratory examinations. For the estimation of glomerular filtration rate (eGFR) the CKD-EPI equation as well as the newly developed, creatinine-based, elderly-specific BIS1 equation were used.

Results: DM in the BIS cohort was prevalent in 539 participants (26%). Of these 145 were on insulin, 314 patients received one or more OADs, and 136 had an elevated HbaA1c only. Table 1 displays the main characteristics of the OAD patients and Figure 1 shows the frequency of the different OADs, with metformin (67.2%), glimepiride (26.8%) and glibeclamide (13.7%) being the agents most commonly taken. Patients treated with metformin (n=211) had a slightly higher mean eGFR compared to the total population treated with OADs (69 vs. 66 ml/min/1.73 m2).

Conclusions: Metformin is the most commonly used OAD in the elderly. Interestingly, a few patients received glibeclamide, a medication recently classified as potentially inadequate for the elderly. OAD patients with more intensive glycemic control (HbaA1c ≤ 7%) had a higher prevalence of cardiovascular comorbidities. Finally, we found a clinically relevant difference of eGFR values with BIS1 (57 ml/min/1.73 m2) and CKD-EPI (66 ml/min/1.73 m2).

SP224

MORNING SURGE ON 24-HOUR BLOOD PRESSURE MONITORING MORE PRONOUNCED IN MILD CHRONIC KIDNEY DISEASE

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Introduction and Aims: Non-dipping effect is associated with chronic kidney disease, but little is known about the levels of the morning surge. The aim of our study was to determine the level of morning surge at 24 hour ambulatory blood pressure monitoring in chronic kidney disease and differences between groups with and without morning hypertension.

Methods: Study group consisted of 72 hospitalized patients (38 males and 34 females), with chronic kidney disease (CKD), defined according to K-DQI criteria. All patient had hypertension and 24 hour blood pressure monitoring was performed. Morning surge was defined as a difference between the hourly systolic blood pressure in the first two hours after waking and the mean systolic blood pressure that included the lowest
blood pressure during sleep. Two groups were defined: a group with morning surge (MS+), where the difference was >35 mm Hg and a group without morning surge (MS-), difference of 5 mm Hg or lower. The group with morning surge consisted of 12 patients (5 females and 7 males).

**Results:**
Patients from (MS+) group were significantly older than (MS-) group (58,3 ± 9,5 years vs. 55,6 ± 9,9 years, p = 0,022). The proportion of patients who initiated PB treatment prior to initiating HD was highest in the UK (19,7%), whereas the proportion of patients treated with calcium-based PBs declined to 14–23% for calcium acetate. There were also country-specific differences in the type of PB used: in Germany, calcium-based PBs were predominant, while in Spain and France a higher proportion of patients were treated with non-calcium-based PBs. The type of PBs used was determined in a model of multiple logistic regression, when morning surge was used as a dependent variable, and none of them were significant predictors of morning surge.

**Conclusions:** Morning surge hypertension is more pronounced in milder forms of chronic kidney disease, while in more advanced disease, non-dipping pattern, but not morning surge hypertension prevails.

**SP225 COUNTRY-SPECIFIC PHOSPHATE BINDER TREATMENT PATTERNS AND TREATMENT DYNAMICS IN PATIENTS WITH CKD**
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**Introduction and Aims:** Hyperphosphatemia is a consequence of CKD progression and is commonly treated with phosphate binders (PBs). Despite existing guidelines, there is wide variation in timing of initiation of PB treatment and choice of PB (calcium-based or sevelamer) in clinical practice. To better understand current treatment patterns, we investigated the timing of PB treatment initiation in relation to hemodialysis (HD) initiation and the type of PBs used in routine clinical practice in five European countries (France, Germany, Italy, Spain and the UK) and the US.

**Methods:** A retrospective study was conducted using patient records provided by 452 experienced nephrologists based in over 200 dialysis centres across Europe and the US. Patient data were included if patients were receiving PB treatment at any time prior to initiation of data collection and had begun receiving HD treatment between January 2010 and September 2011. Data included a variety of lab values and information on PB use and were collected at four timepoints: at initiation of PB treatment, 3 months prior to the start of HD, 3 months after the start of HD, and at the latest consultation available. Descriptive statistics were used to analyse data.

**Results:** Data from a total of 2,263 HD patients were available. Overall, the time of PB treatment initiation coincided with time of HD initiation in half (51%) of the patients; however, country-specific differences were observed (range: 36–42%). The proportion of patients who initiated PB treatment prior to initiating HD was highest in the UK (45%) and lowest in Germany (20%). If patients received PB therapy prior to HD initiation, the majority of them received treatment with calcium-based PBs (26–32%) with calcium-acetate and 23–27% with calcium carbonate; by comparison, sevelamer carbonate was used in 10–15% and sevelamer hydrochloride in 21–22% of patients. The proportion of patients receiving treatment with sevelamer carbonate and sevelamer hydrochloride increased after HD initiation, to 26–32% and 22–24% of patients, respectively. The proportion of patients receiving treatment with lanthanum almost doubled, from 9–14% before HD initiation to 20–22% after HD initiation, whereas the proportion of patients treated with non-calcium based PBs declined from 14–16% for calcium carbonate and 22–23% for calcium acetate. There were also country-specific differences in the type of PB used: in Germany, calcium-based PBs were predominant, while in Spain and France a higher proportion of patients were treated with non-calcium based PBs, both before and after HD initiation.

**Conclusions:** There were prominent differences in the timing of PB treatment initiation and in the choice of PB used (e.g., calcium-based versus non-calcium-based) between the countries investigated in this study. Treatment patterns also appear to be influenced by stage of CKD. Whether these differences affect treatment outcomes remains to be elucidated and warrants further investigation.

**SP226 PREVALENCE OF CHRONIC KIDNEY DISEASE IN POLAND**
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**Introduction and Aims:** The aim of this study was to assess the prevalence of chronic kidney disease (CKD) in Poland. The NATPOL 2011 study was to assess prevalence of CKD, albuminuria and decreased eGFR in a representative sample of adult Polish citizens.

**Methods:** The study was conducted on a representative sample of 2413 of adults in Poland (1245 females – F; 1168 males – M), aged 18 to 79. The response rate was 66,5%. In each subject a detailed medical history was taken, arterial pressure and anthropometric parameters were measured, blood and urine samples were taken. The concentration of serum and urine creatinine was measured with an enzymatic method, whereas urine albumin concentration was measured with an immunoturbidimetric method. Urine albumin concentration was measured once in a morning urine sample. CKD was diagnosed for eGFR (estimated with abbreviated MDRD formula) ≤ 60 ml/min/1.73 m2 or eGFR=60 ml/min/1.73 m2 with coexisting albuminuria (albumin-to-creatinine ratio: M ≤ 17 mg/g, K ≤ 25 mg/g).

**Results:** Prevalence of CKD in adults in Poland aged 18 to 79 years in 9,0% (7,8–10,4, CI 95%) and is higher in males (F 8,5% vs M 9,6%, p=0,194). It increases with age and in the age group 18 to 39 equals 4,0% (F 3,7%, M 4,2%, p=0,416), 40 to 59 years – 8,9% (F 7,6%, M 10,2%, p=0,117). The highest prevalence was observed in the age group 60 to 79 years – 19,8% (F 18,2%, M 21,9%, p=0,163). The prevalence of decreased eGFR ≤ 60 ml/min/1.73 m2 was 5,7% (F 3,5%, M 7,9%, p=0,003). Albuminuria is found 2,5 times more frequent than decreased eGFR (<60 ml/min/1,73 m2) and its prevalence is comparable with results from other countries. In the age group 18 to 39 years the prevalence of proteinuria is 2,6% (F 2,2%, M 2,7%, p=0,67). Albuminuria is found 2,5 times more frequent than decreased eGFR (<60 ml/min/1,73 m2) and its prevalence is comparable with results from other countries. The prevalence was observed in 19,3% of people in Poland aged 18–79 years is high and is comparable with other countries in Europe and worldwide. Data prove CKD to be an essential problem and burden to public health in Poland.
Methods: The subjects of this study were 2017 Japanese individuals (885 men, 1132 women, mean age 63 years) without a history of kidney disease participated in local health checkups. The urinary excretion of uric acid was assessed by the uric acid clearance-creatinine clearance ratio (UACr/CCr) in morning spot samples of urine and blood, and was classified into low (UACr/CCr <0.5%), normal (0.5-11.1%), and high group (>11.1%), according to the guideline from Japanese Society of Gout and Nucleic Acid Metabolism.

Results: The mean value of serum uric acid and UACr/CCr was 5.0 ± 1.3 mg/dL and 7.3 ± 5.0%, respectively. The proportions of low, normal, and high group of UACr/CCr were 40.4%, 39.0%, and 20.6%, respectively. In simple regression analysis the UACr/CCr showed a significant negative correlation with serum uric acid in total subjects (r = 0.33, P < 0.001). In the subgroup analysis the correlation coefficient between serum uric acid and UACr/CCr was higher in men (r = 0.37), subjects with diabetes (r = 0.46), alcohol consumption (r = 0.40) and renal insufficiency (estimated GFR <60 mL/min/1.73m²) (r = 0.37). Multiple linear regression analysis showed that UACr/CCr values were related positively with estimated GFR (β = -0.092) and negatively with HbA1c (β = -0.040), body mass index (β = -0.073) (All P < 0.05). Additionally, UACr/CCr showed a positive correlation with serum adiponectin (r = 0.06, P = 0.009) and urinary albumin excretion (r = 0.07, P = 0.001), and a negative correlation with serum beta2-microglobulin excretion (r = 0.14, P < 0.001). However there was no significant correlation between serum insulin and UACr/CCr.

Conclusions: This study showed that urinary uric acid excretion plays an important role in the regulation of serum uric acid levels in the Japanese general population and the urinary excretion of uric acid might be affected by various factors including gender, life-style, comorbidities, and renal disorders.

### SP230

**THE USAGE OF DRUGS INCLUDING NONSTEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDS) IN PATIENTS WITH CHRONIC KIDNEY DISEASE**

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¹Department of Nephrology, Transplantology and Internal Medicine Medicine University of Gdańsk Gdańsk Poland

Introduction and Aims: The avoidance of NSAIDs is recommended for most individuals with CKD. The aim of presented study was to characterize patterns of drugs use including NSAID among persons with CKD in Gdańsk Nephrology Center in Poland.

Methods: A total of 888 adult participants of the cross-sectional study responded to a questionnaire regarding their use of drugs.

Results: General characteristics of the study group is in the table 1. The most common comorbidities were hypertension, heart failure/iscemic heart disease and diabetes respectively in 71%, 26.2% and 22.9% of the group. The most often drugs used by our patients were: hypotensive agents (67.5%), vitamins (32.8%), statins (27.8%). The average number of drugs received per day was 5. 53.5% of participants used NSAIDs available over-the-counter without a doctor’s consultation. The main causes of using NSAIDs were: bone and joint pains for 25.6% and headache for 25.6% respectively, 24.2% were aware of side effects of NSAIDs. The rest of the study group (75.8%) did not know the side effects or did not answer to this question. Current use (nearby every day for 30 days or longer) of any NSAIDs was reported by 5.3%. 10.1% of the study population used NSAIDs at least once a week. 7.5% used at least two different NSAIDs simultaneously.

The time of CKD was connected with using higher number of drugs (p<0.05) and the frequency of NSAIDs usage was connected with the number of all drugs (p<0.05).

Conclusions: Patients with CKD use a large amount of drugs. Most of them use NSAIDs often or very often without being aware of side effects of them. It is necessary to systematically repeat the patient’s education concerning potential side effects of drugs.
EFFECT ON UREMIC TOXINS ON OXIDATIVE STRESS CAUSED BY NADPH OXIDASE ACTIVITY

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Introduction and Aims: A number of cardiovascular diseases in chronic renal failure patients are characterized by increased concentration of reactive oxygen species (ROS). However, the link between genesis of cardiovascular complications, uric acid toxicity and increased oxidative stress in patients with chronic kidney disease is not well-understood until now. In this study, we investigated the effect of seventy eight known and commercial available uricic toxins on the enzymatic activity of the lymphocytic NADPH oxidase.

Methods: Lymphocytes were isolated, lysed and incubated with NADPH in the presence and absence of the uricic toxin of interest. The degradation of NADPH by the lymphocytic NADPH oxidase was quantified by determination of the absorbance at 340 nm. Additionally, we investigated the effects of plasma on the NADPH oxidase activity.

Results: Thirty nine of seventy eight known uricic toxins showed an effect on the NADPH oxidase activity. Thirty five of the uricic toxins decreased the NADPH oxidase activity. Orotic acid has been characterized as the strongest inhibitor of the NADPH oxidase. Four of the investigated uricic toxins increased the NADPH oxidase activity. SDMA showed the strongest stimulating effect. Plasma from CKD patients before dialysis and the resulting hemofiltrate showed a significant inhibitory effect on the NADPH oxidase activity. Plasma after dialysis showed no effect on the NADPH oxidase activity. Discussion: Uremic toxins with stimulating effect on the NADPH oxidase activity seem to contribute to cardiovascular disease directly. On the other hand the inhibitory uricic toxins may fulfill a direct protective function in the development of the cardiovascular damage in patients with renal failure.

Conclusions: The results of the study demonstrate that uricic toxins may play an important role in the pathogenesis of the cardiovascular complications in chronic kidney disease by modulation of the NADPH oxidase activity.

PATIENTS OVER 75 YEAR FOLLOWED IN PREDIALYSIS CLINIC. GERIATRIC ASSESSMENT

Isabel Rodriguez1, Olimpia Ortega1, Luke Hinostraza1, Gabriela Cobo1, Paloma Galtar1, Carmen Mon1, J. Carlos Herrero1, Milagros Ortiz1, Cristina Di Giogia1, Aniana Oliet1 and Ana Vigil1
1Nefrologia Hospital Severo Ochoa Madrid Spain

Introduction and Aims: In patients older than 75 years with chronic kidney disease (CKD) stages 4 and 5, followed in pre-dialysis clinic, it is important to consider which patients would be better treated with Conservative Care (CC). For evaluation of patients, we introduce geriatric concepts including frailty phenotype. The aims of the study were to examine whether dialysis patients baseline serum UA level predicts long term survival.

Methods: The study was performed after approval of the protocol by the Regional Ethical Review Board, Linköping, Sweden. 33 dialysis patients (29 male and 4 female, mean age 71±12 years) were followed during mean follow-up period of 24 months (1-45 months), 5 of them were treated with allopurinol. To estimate the effect of baseline serum UA level on survival, Kaplan–Meier analysis was performed. Grouping was made according to patients’ group mean UA level 5.75 mg/dl (342 mmol/l), the range was 3.36-8.64 mg/dl (200-514 mmol/l).

Results: During the follow-up 22 patients died, 3 were transplanted and 8 survived. Analysis showed significant difference between survival in the two groups during follow-up. Survival was significantly higher in the group where patients mean baseline serum UA level was below 5.75 mg/dl (342 mmol/l), the range was 3.36-8.64 mg/dl (200-514 mmol/l).


SP233 SERUM URIC ACID LEVEL AND LONG TERM SURVIVAL IN DIALYSIS PATIENTS

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Introduction and Aims: Recent studies suggest that high levels of uric acid (UA) may play an important role in developing hypertension, renal disease and cardiovascular events [1-4]; also elevated serum UA level may lead to chronic and end-stage renal disease [5-6]. Concerning the effect of UA on glomerular filtration rate (GFR), it has been found that serum UA levels are independently connected with reduction of GFR and also contribute to an increased risk for cardiovascular disease and morbidity [7-8].

Further, it has been shown that there is a U-shaped relationship between UA levels and mortality in chronic kidney disease patients [9]. Aim of the study was to examine whether dialysis patients baseline serum UA level predicts long term survival.

Methods: The study was performed after approval of the protocol by the Regional Ethical Review Board, Linköping, Sweden. 33 dialysis patients (29 male and 4 female, mean age 71±12 years) were followed during mean follow-up period of 24 months (1-45 months), 5 of them were treated with allopurinol. To estimate the effect of baseline serum UA level on survival, Kaplan–Meier analysis was performed. Grouping was made according to patients’ group mean UA level 5.75 mg/dl (342 mmol/l), the range was 3.36-8.64 mg/dl (200-514 mmol/l).

Results: During the follow-up 22 patients died, 3 were transplanted and 8 survived. Analysis showed significant difference between survival in the two groups during follow-up. Survival was significantly higher in the group where patients mean baseline serum UA level was below 5.75 mg/dl (342 mmol/l), the range was 3.36-8.64 mg/dl (200-514 mmol/l).

Methods: Our study was performed in 56 patients older than 75 years, the median time of follow up was 25 months (range 12-48). At baseline we analyzed: the frailty, it is defined by Linda P. Fried, as a clinical syndrome in which three or more criteria were present: "unintentional weight loss, self reported exhaustion, weakness, slow walking speed, an low physical activity". Those with two characteristics were prefrail. Other parameters analyzed were: Age, comorbidity, dependence for activities of daily living, cognitive impairment, depression, cardiovascular disease, and the presence of diabetes. With this assessment and in accordance with the patients and families, we classified patients on (CC), and patients with (ITD). In a longitudinal study we evaluate clinic and laboratory parameters, and re-evaluate the frailty, number of hospitalization, and mortality.

Results: Of the 56 patients, 20 patients were included for (CC), and 36 patients with (ITD). On univariate analysis, the predictive factors to determine (CC) were: Age, pre-frailty, cognitive impairment, and dependance for activities of daily living. In multivariable regression: Age (OR=1.25, CI 95%, 1.04-1.52, p=0.018) and pre-frailty (OR 17.6,CI 95%, 3.16-97.96, p=0.001) remained as independent predictors factors of the choice of (CC). We compared both groups during the follow up. Surprisingly the patients with ITD were more inflamed. (CRP 10 (2-150) vs 4(1-10)mg/L,p=0.004).

There was no significant differences in nutritional biomarkers, except cholesterol levels, where there was a lower in the ITD group (180.5±50 mg/dl vs. 300±50 mg/dl, p<0.0005, “inversely, epidemiology”. 220). The Hb was higher in patients on CC (12, 9± 0.9 vs. 12 ± 1.2 g/dl, p=0.018), with the same erythropoietin per week. The number of hospitalization was higher in patients with ITD. In survival analysis there were no significant differences between groups.

Conclusions: The state of frailty in elderly patients with chronic kidney disease stages 4 and 5, lead to nephrologists to make decisions about treatment. Conservative treatment may be a good option in the aging populations.

SP236 SURPRISINGLY HIGH PREVALENCE OF CHRONIC KIDNEY DISEASE NOT ONLY IN CROATIAN ENDEMIC NEPHROPATHY AREA BUT ALSO IN NON ENDEMIC VILLAGES

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Introduction and Aims: Despite increasing awareness of chronic kidney disease (CKD) burden, epidemiological data from many regions are still lacking. There are no data on CKD prevalence in Croatia, and our aim was to analyze it in Croatian rural area including endemic nephropathy (EN) villages using 4 different formulas to estimate GFR.

Methods: In this cross sectional survey we have enrolled 1573 subjects (consecutive sample, participation rate 91%, mean age 51.80±17.09). Subjects were from EN villages (N=1226) and from non-EN area (N=347). GFR was estimated using 4 formulas (C-G, MDRD, MCQE, CKD-EPI), and albumin/creatinine ratio (ACR) was determined from spot morning urine sample. Blood pressure (BP) was measured following ESH/ESC guidelines, hypertension was defined as BP ≥140/90 mmHg and/or taking antihypertensive drugs, diabetes was diagnosed if fasting blood glucose ≥7 mmol/l and/or taking antidiabetic drugs. CKD was diagnosed and classified according to the KDIGO 2009 classification.

Results: Prevalence of CKD was higher in EN than in non-EN villages in both men and women (p<0.00005; p<0.00005, respectively). There were no differences in prevalence of hypertension, diabetes or obesity between EN and non-EN villages (p>0.05). Using all 4 formulas we observed significantly higher prevalence (%) of stages CKD ≥3A in EN than in non-EN area (16.7, 15.5, 8.7, 16.3 vs. 8.3, 6.6, 1.1, 8.0; p<0.00005;p<0.00005; p<0.00005; p<0.00005, respectively). However, lower prevalence (%) of stages CKD 1 and 2 was found in EN area (4.4, 4.7,5.5, 4.4 vs. 6.3, 7.4, 8.3, 6.5; p=0.004; p=0.004; p=0.004; p=0.0005, respectively). We also failed to find differences in prevalence of ACR and albumin/creatinine above the cut-off values between EN and non-EN (p=0.01). In both EN and non-EN areas MCQE formula significantly underestimated prevalence of CKD stages ≥3A (p<0.00005).

Conclusions: High prevalence of CKD stages ≥3A in EN area very probably reflects present of subjects with milder clinical course of EN (either due to lower ingestion of AA or beneficial genotype). Due to higher risk of urethelial cancer those subjects should be closely monitored. Lower prevalence of early stages of CKD in EN area is in line with hypothesis that environmental factor i.e. AA is no longer active, and it could be speculated that in future prevalence of all CKD stages in EN area will be the same as in non EN villages.

SP237 HIGH-NORMAL PROTEINURIA; RISK OF RENAL DISORDER IN FAMILIAL MEDITERRANEAN FEVER

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Introduction and Aims: The most common presenting feature of renal involvement due to Familial Mediterranean Fever (FMF) is proteinuria, which gradually progress in to nephritic syndrome and/or renal dysfunction. The aim of this study was to investigate the association between high-normal proteinuria and a risk of renal insufficiency in FMF patients.

Methods: We retrospectively examined the data from 90 FMF patients between 2005 and 2013. Clinical and biochemical parameters, 24-hour proteinuria, were obtained.
Chronic kidney disease (CKD) was defined as kidney damage with or without a decrease in GFR, which was calculated using MDRD formula.

**Results:** The median follow-up time was 57 (3,82) months. All patients were normotensive, non-diabetic and had no cardiovascular disease. Median age was 29 (17, 54) years and 33% were male. Basal creatinine level was 0.8 (0.5, 1.2) mg/dL. Median 24-hour protein excretion was 69.3 (22, 1192) mg/day and creatinine clearance was 94 (58, 190) ml/min/1.73 m². Among the whole study population 88.9% was normal proteinuric (<150 mg/day), 11.1% was proteinuric (>150 mg/day). In normal proteinuric group, we created five subgroups with the upper cut of values of 45, 64, 75, 96 and 149.6 mg/g for quintiles 1, 2, 3, 4, and 5, respectively. Age and basal creatinine levels did not differ among fifths (p=0.459, p=0.31 respectively). Also no difference was found between 5 quintiles when comparing basal creatinine clearance levels (p=0.147). In regression model fifth quintile subgroup revealed 1.1 times greater creatinine clearance levels (p=0.029).

**Conclusions:** This is the first study, which investigates the possible renal adverse outcomes of high-normal proteinuria in EME patients without documented amyloidosis. Our study points to an increased glomerular filtration rate in the group of high-normal proteinuria. This finding is important because presence of hyperfiltration under mild increase in proteinuria may be sign of possible augmented glomerular hyperperfusion, which predispose chronic renal insufficiency.

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**ALBUMINURIA AND 25-HYDROXYVITAMIN D IN PATIENTS WITH CHRONIC KIDNEY DISEASE**

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**Introduction and Aims:** According to some data vitamin D is involved in the pathogenesis of albuminuria. The aim of this study was to evaluate the relationship between albuminuria and 25-hydroxyvitamin D (25(OH)D) in patients with chronic kidney disease (CKD).

**Methods:** In our study 76 CKD outpatients (53 males and 23 females; age 60.5±12.5 years) were included. Thirty-two (42.1%) patients were smokers and 19 (25.7%) patients were diabetics. Urinary albumin/creatinine ratio (UACR), 24-hour urinary albuminuria (24hUA), 25(OH)D, cystatin C and hs-CRP were measured. In all subjects 24-hour ambulatory pulse pressure (24hAPP) data were included in further analyses.

**Results:** Data of patients are presented in table 1. On univariate analysis UACR was associated with 25(OH)D (P=0.001) and cystatin C (P=0.006). Also 24hUA was associated with 25(OH)D (P=0.01) and cystatin C (P=0.01). With multiple regression analysis included variables: 25(OH)D, age, cystatin C, hs-CRP, 24hAPP (smoking, diabetes) UACR was associated with 25(OH)D (P=0.009) and cystatin C (P=0.012). With multiple regression analysis also 24hUA was associated with 25(OH)D (P=0.029) and cystatin C (P=0.006).

**Conclusions:** Albuminuria (urinary albumin/creatinine ratio, 24-hour urinary albuminuria) is associated with 25-hydroxyvitamin D and cystatin C in patients with CKD.

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**FREQUENCY AND SIGNIFICANCE OF QT PROLONGATION AND QT DISPERSION IN CHRONIC RENAL FAILURE PATIENTS**

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**Introduction and Aims:** Cardiovascular mortality is high in chronic renal failure patients. Most studies have been reported that increase in QTc interval and QTc dispersion are risk factors that predispose to severe ventricular arrhythmias and sudden death. The aim of this study was to evaluate the frequency and predictive value of QT, QTc, QT dispersion (QD) and QT corrected dispersion (QTD) in chronic renal failure patients, included or not in chronic dialysis program.

**Methods:** On 46 patients (66% male, age 40.3±1.6 years) with CRF we analysed QT, QTc interval with 12 lead electrocardiogram, QT dispersion, assessed the difference between maximum and minimum QT. 64/46 patients (13%) had long QT max interval (>450 ms). After correction of QT interval, using Frederic’s formula (QTc), 19 patients (42%) had QT prolongation (>450 ms).

**Results:** Linear regressive analysis showed that QTc prolongation is statistically significant correlated with number of years of renal failure (r=0.52), serum concentration of potassium (r=0.51) and calcium (r=0.37). QTd and QTD were in normal range 45±13.91 ms and 45±19.77 ms resp.

**Conclusions:** Despite the high incidence of QTc prolongation in these patients (42%), QTd and QTD were normal and short-term consequences are not as severe as those in cardiac patients. This is possibly explained by the different pathogenic mechanisms of arrhythmia in CRF when electrolytic disorders are the main cause for the development of arrhythmia.

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**STRATEGIES TO PREVENT KIDNEY DAMAGE IN HOSPITALIZED PATIENTS: A SYSTEM THAT PROTECT PATIENTS FROM NEPHROTOXIC DRUGS AND CONTRAST MEDIA STUDIES**

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**Introduction and Aims:** More than 50% of hospitalized patients present some degree of renal failure. During their hospital stay these groups of patients are more suitable to receive a greater amount of drugs (i.e. older age and have more comorbidities) and to undergo interventional studies. Both conditions increase the risk of kidney function damage together with an increase in patient morbidity and hospital length of stay. In daily clinical practice the opportunity to take actions in order to prevent kidney damage by an adequate prescription of medicines (i.e. dose) or hydration for prevent contrast media injury are limited. Our aim was to design, develop and implement an alert system that at bed-side and in real time will inform about those medicines prescribed that will require dose adjustment and a correction proposal together with information regarding prophylactic measures to prevent kidney damage by contrast media depending of the patient renal function (MDRD-4).

**Methods:** The program was developed in collaboration with the departments of informatics, pharmacy and nephrology. Our center is in a 900 beds facility and attend a population of 450.000 habitants. Initially the system was applied in patients admited to internal medicine department during one month period in order to stablish the requirements and suitability of the system. Then the program was extended to all hospitalized patients.

**Conclusion:** During this period there were 330 admissions and in relation to the degree of kidney damage we observed: 72.1% had stage-2 CKD, 34.3% had stage-3 and 10% had stage-4+. The number of patients that were receiving medicines suitable of dose adjustment was 264 (80%). Of these patients the amounts of medicines per patient (mean) that dose adjustment were: 2.1 for stage-2, 3.3 for stage-3 and 4.2 stage-4+. In this period the number of patients that were programmed for a contrast study were 21 (6.4%) all of them had stage-3 CKD.

**Conclusions:** This system allowed to detect instantly those patients that will require dose adjustment of nephrotoxic drugs and prophylactic actions to prevent renal
damage caused by contrast media. These actions will decrease the morbidity and adverse events associated with kidney damage. At least in hospital settings the technology permits the development of cost-effective actions against chronic kidney disease.

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**FASTING THE MONTH OF RAMADAN FOR PATIENTS WITH CHRONIC KIDNEY DISEASE: IMPACT ON KIDNEY FUNCTION AND CARDIOVASCULAR OUTCOMES**

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Introduction and Aims: Nephrologists all around the world are frequently asked by their muslim CKD patients for opinion about the medical feasibility of fasting. Fasting Ramadan is a religious obligation for Muslims who represent 20% of the world population. Fasting entails abstinence from eating and drinking for periods that may exceed 18 hours with the possibility of dehydration and hyperviscosity posing risks of deterioration of kidney function and vascular thrombosis of already diseased vessels.

Little is known about the safety of fasting for these patients and the risk factors reflecting on their renal and cardiovascular health during fasting. This study was designed to follow CKD patients during fasting and disclose the outcomes relating to kidney functions and major adverse cardiovascular events on the short and medium term as well as factors influencing these outcomes.

Methods: This cohort study followed CKD patients with stable kidney function who chose to fast the month of Ramadan after being warned about possible hazards. Patients who chose to fast were urged to discontinue fasting in the face of any significant change of kidney function. A group of non-fasting CKD patients served as controls. Serum creatinine was recorded at the beginning of the month, after one week fasting, at the end of the month and 3 months later. Clinical data and follow up for major cardiovascular events were recorded (defined as acute coronary syndrome, stroke or acute peripheral vascular disease).

Results: Patients completing follow up of 52 fasting months and 54 non-fasting controls were included (mean eGFR 27.7, S.D. 13 and 21.5, S.D. 11.8 ml/min/1.73m² respectively). A rise of serum creatinine was noted during fasting in 60.4% of instances by day 7 which was associated with intake of RAAS antagonists (R.R. 2.95, CI 1.2 3.5, P=0.002) and diuretics (R.R. 1.6, 95%CI 0.95-2.9, P=0.048) but lower in those on calcium channel blockers (R.R. 0.6, 95%CI 0.36-0.9, p=0.014). Significant rise of serum creatinine (>30%) was seen in 9 instances and was once again associated with RAAS blockade (R.R.8.3, 95% 1.6-62, P=0.006). Creatinine returned to baseline in most fasting patients by the end of 3 month of follow up and remained elevated in only 12 patients, not significantly different from controls, p=0.17. Adverse cardiovascular events were observed in 6 patients in the fasting cohort all of whom had experienced worsening of kidney function after the first week of fasting (p<0.009) and 5 of whom also had pre-existing cardiovascular disease (R.R 15, 95% CI 2.115, p=0.001). On the other hand only 1 event was recorded in the control group, p=0.036.

Conclusions: Among CKD patients, fasting was associated with deterioration of kidney functions that was associated with RAAS inhibitors and diuretics and was largely reversible. Adverse cardiovascular events occurred more frequently in fasting CKD patients particularly those who exhibited an early rise of serum creatinine and those with pre-existing cardiovascular disease.

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**PRE-DIALYSIS CARE AND RATE OF PROGRESSION OF RENAL DISEASE: EXPERIENCE OF AN OUTREACH PRE-DIALYSIS SERVICE**

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Introduction and Aims: The number of patients with Chronic Kidney Disease (CKD) is rising and is associated with significant morbidity and mortality. The annual acceptance rate for renal replacement therapy in the United Kingdom is also rising steadily (1). Patients with advanced CKD have an increased cardiovascular risk that needs to be addressed in the earlier stages. In addition, a multidisciplinary, integrated approach to pre-dialysis care can optimize dialysis and transplantation outcomes and reduce morbidity and mortality. In the Kidney Disease Outcomes Quality Initiative (KDOQI) classification system of CKD, preparation for renal replacement therapy has been recommended in CKD stage 4 with the estimated glomerular filtration rate (eGFR) to <30 ml/min. The term ‘pre-dialysis’ has not been officially defined in guidelines. However, most renal physicians will institute pre-dialysis care in patients with a eGFR <15– 20 ml/min. At our renal unit, patients are referred for pre-dialysis care with an eGFR < 20ml/min for optimization of treatment and patient education.

Methods: All patients who were referred to the pre-dialysis team with an eGFR < 20ml/min from 2010-2012 at a satellite outreach renal clinic were included. Data was collected retrospectively. The rate of renal disease progression and other important biochemical parameters over a 24 month period were recorded. The prevalence of diabetes and hypertension in this cohort were also reported.

Results: A total of 81 patients were included in data analysis who remained in pre-dialysis care. eGFR at time of analysis was 13.9 (mean) and 14 (median). At 12 months previously eGFR was 16.2 (mean) and 16 (median)/at 24 months eGFR was 22.6 (mean) and 20 (median). Therefore, rate of renal disease progression was 4.4ml/ year (mean) and 3ml/year (median). The monthly rate of renal disease progression being 0.36 ml/month (median) and 0.25ml/month (median). Table: Renal progression: eGFR and serum creatinine (Cr) values. A total of 30 patient went to dialysis during this period (24 haemodialysis and 6 peritoneal dialysis) and 10 patients died while on pre-dialysis care without reaching end stage renal disease (not included in this analysis).

Conclusions: Management of severe CKD requires a well organised and patient-focused multidisciplinary approach. Optimal pre-dialysis care can maintain the residual renal function for longer and delay progression and the need for renal replacement therapy. Therefore, specialised pre-dialysis care leads to improved quality of life for these patients and also have economic benefits.

References:
management of risk factors and interventions aimed at slowing the development and or the progression of CKD. To achieve such a goal a successful screening program for CKD is a need.

Objectives: Educational: To educate house-officers the principles of research in the field of prevention of NCD’s. Scientific: - To estimate the prevalence of chronic kidney disease, hypertension, diabetes and obesity in Alexandria Region which includes four governorates, as a representative for the whole Egyptian population. - To identify some possible risk factors that might play a role in the occurrence of CKD with the final aim of recommending a program for its prevention and control.

Methods: The cross section study was carried in Alexandria Region. Population based screening program for proteinuria, hypertension, diabetes and obesity was conducted. A representative sample (around 2000 persons) was considered to cover the four governorates of Alexandria Region. Trained house officer physicians were responsible for screening their adult family members and neighbors collecting the general information on the subject’s demographic data, diet, smoking, herbal use, alcohol and recreational drug consumption, caffeine exposure, analgesics and physical activity.

Screening campaigns were also performed to complete the allocated sample. Data about family and medical history for kidney disease, high blood pressure, diabetes and cardiovascular disease and, if any, current treatment, were also recorded. Physical examination was also performed for the whole screened population including the following: weight, height, waist and body mass index (BMI), blood pressure.

Investigations included the followings: Urine protein concentration, serum creatinine concentration, fasting plasma glucose (FPG), fasting plasma cholesterol (FPC) and triglycerides.

Results: The prevalence of chronic kidney disease varied from 2-21%, diabetes reached up to 12%, hypertension exceeded 40% and obesity reached up to 83% in some regions in Alexandria Region- Egypt. The risk factors including smoking, drinking water, herbal use, dietary habits and others were found to be correlated with the occurrence of CKD and other NCD’s.

Conclusions: Similar projects could be applied in different universities to raise the awareness among junior staff about NCD’s prevention and control as well as to screen the whole country.