EPIDEMIOLOGY - RENAL OUTCOMES

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

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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: Is 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 23±3 Kg/m², creatinine 2.5±1 mg/dl, BUN 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)1.066

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>
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<tbody>
<tr>
<td>iGFR Tabuk formula</td>
<td>43±22</td>
<td>7-120</td>
<td>39</td>
</tr>
<tr>
<td>eGFR Tabuk formula</td>
<td>44±22</td>
<td>8-124</td>
<td>40</td>
</tr>
<tr>
<td>eGFR CKD-EPI (ml/min/1.73m²)</td>
<td>39±16</td>
<td>7-113</td>
<td>35</td>
</tr>
<tr>
<td>eGFR MDRD (ml/min/1.73m²)</td>
<td>40±18</td>
<td>8-116</td>
<td>37</td>
</tr>
<tr>
<td>eGFR Walser (ml/min/3m²)</td>
<td>37±17</td>
<td>3-97</td>
<td>3-97</td>
</tr>
<tr>
<td>eGFR Mayo Clinic (ml/min/1.73m²)</td>
<td>48±26</td>
<td>10-145</td>
<td>41</td>
</tr>
<tr>
<td>eGFR Nankivell (ml/min/1.73m²)</td>
<td>50±17</td>
<td>13-116</td>
<td>47</td>
</tr>
<tr>
<td>eGFR Cockcroft-Gault (ml/min/1.73m²)</td>
<td>52±23</td>
<td>13-140</td>
<td>47</td>
</tr>
<tr>
<td>eGFR Cockcroft-Gault (ml/min/1.73m²)</td>
<td>55±21</td>
<td>13-140</td>
<td>47</td>
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</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 (4)</th>
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</thead>
<tbody>
<tr>
<td>Tabuk formula</td>
<td>44</td>
<td>78</td>
<td>91</td>
<td>0.73</td>
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<tr>
<td>CKD-EPI</td>
<td>24</td>
<td>55</td>
<td>77</td>
<td>0.63</td>
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<tr>
<td>MDRD</td>
<td>20</td>
<td>51</td>
<td>71</td>
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<tr>
<td>Walser</td>
<td>19</td>
<td>49</td>
<td>70</td>
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<tr>
<td>Mayo Clinic</td>
<td>18</td>
<td>47</td>
<td>61</td>
<td>0.56</td>
</tr>
<tr>
<td>Nankivell</td>
<td>16</td>
<td>37</td>
<td>63</td>
<td>0.57</td>
</tr>
<tr>
<td>Cockcroft-Gault</td>
<td>15</td>
<td>35</td>
<td>49</td>
<td>0.56</td>
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PROGRESSION OF CHRONIC KIDNEY DISEASE (CKD) IN THE RENAL RESEARCH INSTITUTE (RRI)-CKD STUDY

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Introduction and Aims: Understanding CKD progression is critical in designing optimum clinical management. There is little data from prospective cohort studies examining patterns and predictors of CKD progression. Our aim was to examine patterns and predictors of CKD progression in a prospective CKD cohort.

Methods: This study is a prospective observational study of adult patients with CKD Stage 3-5 conducted at 78 US nephrology clinics enrolled between 06/2000-01/2006. Data on demographic, comorbidity, laboratory, and medication were collected at all routine clinic visits. Glomerular filtration rate (GFR) was estimated using the 4-variable MDRD and CKD-EPI equations. CKD progression was assessed by eGFR change per year and time to ESRD. Multiple linear regressions were used to assess associations between eGFR slope and baseline characteristics. Rate of progression was analyzed using linear mixed models to predict eGFR over time and using all available data. Time to ESRD was analyzed by Cox survival models.

Results: 2,182 patients were enrolled in the study; mean age 63±15.65% white, 55% male, 47% diabetic, 52% hypertensive, 49% with a history of cardiovascular disease (CVD). Mean eGFR was 25±11 ml/min/1.73m², with the majority (77%) in CKD Stage 3 (28%) or 4 (49%) at enrollment. Patients were followed for a median of 2 years with an average of 4 follow-up clinic visits per year. There were 582 ESRD events and 184 deaths. GFR was either stable or ‘improving’ over time in 37%. Older age, higher CO2 or serum albumin were associated with slower progression, while black race, male, diabetics, with history of CVD, higher systolic blood pressure and higher serum sodium were associated with steeper negative slope of eGFR decline. Figure displays adjusted eGFR slope estimates obtained from mixed model for patients with specific characteristics. Male sex, black race and DM were associated with a higher risk of ESRD, while older age, higher eGFR, higher serum albumin and use of ACEI or ARB was associated with a lower risk of ESRD. After adjustment for all factors noted above, a 10 ml/min/1.73m² higher eGFR was associated with a 74% lower risk of ESRD.
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.

**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; GCCKD, 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 based on medical reports.

**Results:** Starting in 2009, participants are seen in the study clinics in 1-2 year intervals for a total follow-up duration of at least 4-10 years depending on each study’s protocol. At each follow-up visit, information is recorded on any incident micro- and macrovascular event, renal replacement therapy, cancer, hospital admission, and death. Furthermore, standardized clinical measurements are performed and blood and urine samples are taken, where possible, in a fasting state. Biomaterials are processed according to best pre-analytical methods for routine analyses in the core laboratory and for long term storage in each of the studies’ biomaterial bank. Routine laboratory analyses include s-creatinine, cystatin C, albumin, CRP, lipid profile, calcium, phosphate, sodium, urea, uric acid, urine albumin/creatinine ratio. Baseline and follow-up core data as well as laboratory results are kept in a central data repository and underlie detailed regulations regarding data protection, data access and future analyses by the network and external collaborators.

**Conclusions:** The network of German Kidney Cohorts is establishing a prospective study cohort of 17,000 patients. This will expedite future research on factors involved in the initiation and progression of CKD and its complications.
endocardiologist 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 the eGFR is between 45 and 59 ml/min/1.73 m² (stage 4). Physicians specified that in 39.2 % of cases the underlying cause of CKD was T2DM, 38.7% hypertension and 22% CV disease. 19% of physicians indicated that they usually discontinue angiotensin-converting enzyme inhibitor or angiotensin receptor blocker therapy to raise the eGFR in a patient near dialysis.

Conclusions: These findings indicate that while timely access to nephrologist and endocardiologist 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.

Introduction and Aims: We started the kidney early evaluation program in Japan (KEEP JAPAN) in 2006. This program is a cost-free chronic kidney disease (CKD) detection program targeted for population with high risks of CKD that is a history of hypertension (HTN) or diabetes mellitus (DM), or family history of HTN, DM or CKD. The aim of this study was to report data from KEEP JAPAN and detect the relationship between a decline in eGFR and the lifestyle as risk factors.

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 eGFR was defined with positive urine ACR (> 30 mg/gCr) and/or decreased eGFR (< 60 ml/ min) using Japanese equation because of the racial composition in Japanese population.

Results: CKD 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 2.08, 95% CI 1.35 – 2.66), history of cardiovascular disease (OR 0.28, 95% CI 1.83 – 2.66), older than 60 years of age (OR 4.46, 95% CI 3.58 – 5.56), history of CV disease (OR 2.08, 95% CI 1.36 – 3.18), higher blood pressure without DM or >130/85 mmHg in participants with DM, 2.40, 95% CI 1.58 – 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/1.73 m² (95% CI 0.36 – 0.70) and the mean decrease in eGFR was 0.03 ml/min/1.73 m² (0.03) 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/1.73 m² vs. 0.52), and those who did not have a family doctor (1.14 ml/min/1.73 m² vs. 0.44). Loss in weight tended to prevent the decline in eGFR (0.17 ml/min/1.73 m² vs. 0.66). Furthermore, present smoking and alcohol intake may be a risk factor for the decline in eGFR (1.06 ml/min/1.73 m² vs. 0.55 and 0.68 vs. 0.46, respectively).

Conclusions: It demonstrated that obesity and high blood pressure are risk factors for prevalence of CKD. The corrections 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.
equation was 76.3±11.0 ml/min/1.73m² and 86.0±13.6 ml/min/1.73m², respectively. The prevalence of CKD stages 3 to 5 was 5.2% when using the MDRD equation, but was lowered to 1.9% when using the CKD-EPI equation. Then, 3.3% of participants were excluded from CKD by the MDRD equation.

Progression to end stage renal disease (ESRD) and its complications lead to underlying causes of CKD, such as diabetes and hypertension in the United States and timely treatment, can often delay or even prevent onset and progression. However, the United States lacked a dedicated system for surveillance of CKD until the recent Centers for Disease Control and Prevention (CDC) CKD Initiative.

Methods: The project teams developed a Steering Committee and Advisory Board including stakeholders from many government agencies, academic experts, clinicians, and advocacy groups. Based on literature review and expert opinion, broad topic areas were defined and measures were enumerated. Concurrently, existing data sources were researched and evaluated based on a standardized interview. The Steering Committee and Advisory Board then ranked the measures and data sources within each topic group on importance. A modified two-step Delphi process was used to obtain consensus on the prioritization of measures and data sources.

Results: The National CKD Surveillance System has now launched its public website – www.cdc.gov/ckd/surveillance. It systematically tracks and reports information on the following six major topics: (1) the burden of disease, (2) burden of risk factors, (3) disease awareness, (4) quality and processes of care, (5) health consequences associated with CKD and (6) health system capacity available to deal with CKD. This publicly available CKD Surveillance System contains the largest comprehensive collection of CKD data available in the US, from 20 different data sources. A total of 136 measures were identified under the six broad topics outlined above. Specific indicators were developed for these measures, yielding approximately 200 charts with corresponding tables. Data are searchable and graphics customizable. The charts and tables are downloadable for public use at no cost. New measures and indicators are continually under development and the website will be updated regularly. This resource can be used for targeted patient and provider education, to monitor disease burden and trends in health consequences of CKD and health care capacity.

Conclusions: We anticipate that this surveillance system will provide the basis for widespread efforts toward prevention and optimal disease management strategies by raising awareness, reducing CKD progression, lowering mortality and controlling resource utilization associated with this important chronic disease.

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TWO NEW INSTRUMENTS TO MEASURE AUTOSOMAL POLYCYSTIC KIDNEY DISEASE (ADPKD) RELATED DISEASE (ADPKD-IMPS) AND ADPKD-URINARY IMPACT SCALE (ADPKD-UIS)

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Introduction and Aims: Patient-reported disease burden in ADPKD has not been sufficiently quantified. No instruments have been designed and validated specifically to measure ADPKD-related burden nor health-related quality of life (HRQoL). Based on extensive international qualitative research on patient disease impact, 2 patient-reported outcomes (PRO) instruments were developed:

- ADPKD-15: captures overall disease impact on a 5-point response scale of 18 questions covering 3 domains (physical, fatigue, emotional)
- ADPKD-UIS: captures urinary impact on a 5-point response scale with 11 items covering 3 domains (daytime urinary urgency, daytime urinary frequency, nocturia).

Cross-sectional data from a sample of patients in the United States were analyzed to establish reliability and validity of both instruments.

Methods: US-English versions of ADPKD-15 and ADPKD-UIS were administered to 702 adults with ADPKD (CKD stages 1-5). Reliability and validity of both instruments were examined using confirmatory factor analysis (CFA) to ensure data fit with concepts patients noted as most important in qualitative research, item-response theory (IRT), and classical psychometrics at the item- and scale-level for each instrument/domain. Convergent validity correlations with the SF-12v2 and Brief Pain Inventory – Short Form (BPI-SF) were also examined.

Results: CFA confirmed a strong fit of ADPKD-15 and ADPKD-UIS items with their respective theoretical domains. Internal consistency for all domains ranged from the mid .80s to mid .90s. Finally, convergent validity of the ADPKD-15 and ADPKD-UIS domains with the SF-12 and BPI-SF domains were appropriately ranged from the mid .40s to mid .60s, and the magnitude of correlations supported interpretation of physical and emotional domains on the new instruments: for example, ADPKD-15 physical domain correlated well with the SF-12 Physical Component Summary (PCS) while the emotional domain correlated well with the SF-12 Mental Component Summary (MCS).

Conclusions: This study provides support for reliability and validity of both instruments based on cross-sectional data. The ADPKD-15 provides patient-endorsed and psychometrically strong measures of HRQoL for physical impact, fatigue, and emotional impact and the ADPKD-UIS provides reliable measures of urinary symptom impact on daytime urgency and frequency, and nocturia. Future research is required to evaluate stability of the instruments over time and their ability to detect true change in symptoms within an individual. Overall, these are encouraging results for ADPKD-specific measures of patient burden.

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ASSOCIATION OF EXERCISE WITH PROTEINURIA IN A LARGE JAPANESE GENERAL POPULATION SAMPLE

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Introduction and Aims: Exercise habitant is well known to have favorable effect upon metabolic syndrome. And metabolic syndrome might cause proteinuria and CKD. But it remains unknown that exercise habitant have favorable effect upon proteinuria, although heavy exercise sometimes cause proteinuria. Aim of this study is to reveal the effect of exercise habitant upon proteinuria.

Methods: This study is cross-sectional cohort study. Subjects were 290213 persons who received the Specific Health Check and Guidance in Japan in Okayama, Ibaraki, Miyagi,
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 experiential 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 homes 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 techniques 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.

Conclusions: Exercise habitant might ameliorate the incidence of proteinuria.

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A NOVEL APPROACH TO MANAGING CHRONIC KIDNEY DISEASE: REMOTE MONITORING

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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 individual 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 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, where Medicare reported expenditures on CKD patients in US to be more than $60 billion in 2007 versus $25 billion for ESRD.

A NOVEL APPROACH TO MANAGING CHRONIC KIDNEY DISEASE: REMOTE MONITORING

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 analogue approved for treatment of several types of cancers. The development of thrombotic microangiopathy (TMA) has been documented in a small part of Gem recipients. However, incidence of renal dysfunction, not accompanying clinically-detectable TMA, has been documented in a small part of Gem recipients. The single-agent administration of Gem is likely to be associated with a mild decrease in eGFR among the cancer patients, particularly in male diabetic recipients who were given higher dose of Gem.

Methods: Six-month longitudinal study was conducted to ascertain impact of Gem treatment on renal function in 106 pancreatic or biliary cancer patients, including 58 men. The cohort included participants who had never received any anti-cancer therapy before receiving the single-agent therapy with Gem for this study, having normal renal function at baseline, defined as estimated glomerular filtration rate (eGFR) > 60 ml/min/1.73 m². Clinically-detectable TMA was defined as renal failure with either microangiopathic hemolytic anemia with ≥1+ schistocytes on peripheral smear, elevation of serum lactate dehydrogenase or thrombocytopenia levels < 120 x 10⁹/L. New-onset renal dysfunction was defined as a decrease in eGFR over 25% from baseline in the 6-month follow-up period. Factors associated with incident renal dysfunction were determined by multivariable logistic regression analysis, adjusted for several known risk factors of kidney disease.

Results: There were no patients who was diagnosed TMA. eGFR declined from 84.6 ± 16.8 to 70.9 ± 17.9 ml/min/1.73 m², with mean decrease ratio of 16.2 ± 16.9% (P < 0.001). The cumulative incidence of renal dysfunction was 26.4%, and eGFR of affected patients reduced from 88.9 ± 19.3 to 53.7 ± 16.8 ml/min/1.73 m². The factors associated with incidence of renal dysfunction were men (OR, 3.98; 95% CI, 1.34–13.64), coexistence of diabetes mellitus (OR, 3.39; 95% CI, 1.27 – 9.52), and Gem use of higher cumulative dose than the mean dose given to the cohort (OR, 2.93; 95% CI, 1.07 – 8.64).

Conclusions: The single-agent administration of Gem is likely to be associated with a mild decrease in eGFR among the cancer patients, particularly in male diabetic recipients who were given higher dose of Gem.

GFR ESTIMATION BY URINARY SOLUBLE MEGALIN

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Introduction and Aims: Megalin, an endocytic receptor of proteins filtered in the glomeruli, abundantly present in proximal tubular epithelium. We previously found that the amount of urinary soluble megalin was correlated with estimated glomerular filtration rate(eGFR) in nephrotic renal diseases. We examined relationship between measured GFR and urinary markers including soluble megalins in various diseases.

Methods: We studiedulin and paraaminobenzoic acid clearance to evaluate renal function and renal plasma flow in 121 patients. We also measured the levels of urinary soluble megalin, podocalyxin, NAG, β-2 microglobulin, α-1 microglobulin and other urinary markers, and tried to find the relationships between GFR, RPF and these markers. To study daily amount of those markers, we collected 24-hour urine in three consecutive days in 29 patients.

Results: We separated the subjects with their GFR as follows; Group 1(n=54); GFR<30ml/min/1.73m², Group 2(n=37); 30>GFR<50ml/min/1.73m², Group 3 (n=24), 15>GFR<30ml/min/1.73m², and Group 4 (n=9); GFR>15ml/min/1.73m². Urinary megalin was 49.5±40.5pmol/gCr in Group 1, it was 49.1±40.5pmol/gCr in Group 2, 51.3±53.1pmol/gCr in Group 3, and 22.8±15.2pmol/gCr in Group4. Comparing to the patients with nephrotic syndrome, the level of urinary soluble megalin was highly correlated with GFR in patients with non-nephrotic range proteinuria (UP<3.5g/day) (n=107, r=0.25, P<0.008). Average daily excretion of soluble megalin was10.5±9.39pmol/day and this was decreased with GFR reduction.

Conclusions: Megalin is abundantly located at epithelium of proximal tubules,Megalin excretion in urine may be reflect number and amount of functional proximal tubules, and one of the ideal predictor of functional nephron number.

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 is an essential part of preventive healthcare,
Results: The average age (±SD) was 54.2 (18.2) years, 46.3% were men. The mean serum creatinine (±SD) and estimated MDRD glomerular filtration rate (eGFR) ml/min/1.73 m² were 81.1 (34) and 81.6 (22) respectively. Median rate of progression for the population was -0.14 ml/min/1.72m²/yr and was more rapid in men (±0.36) than women (0.01). Fast progressors (14.7% of population) had median decline of -6.27 ml/min/yr while slow progressors declined at -1.58 ml/min/yr. Almost half of the study population (52.2%) had no patients using CRF over 5 years. Predictors of fast progression included advancing age (Odd Ratio (OR)=1.90 per 10 yr), male sex (1.48), serum sodium (1.22 per mmol/L increase), neutrophil count (1.04 per unit increase), baseline eGFR (1.26 per 10 ml/min higher), haemoglobin (1.29 per g/dl lower), serum calcium (2.86 per 1 mmol/L lower); All P< 0.01.

Conclusions: While overall rates of CKD progression are modest for patients within the health system, 15% experienced an accelerated decline in kidney function. This high risk population could be easily be identified and characterized from a passive disease surveillance system.

Introduction and Aims: Evaluating health related quality of life (HRQOL) among chronic kidney disease (CKD) patients is important for assessment of their care. It offers unique information for comparing different treatment modalities. The pattern of HRQOL among predialysis patients has received little attention. We aimed to assess HRQOL among predialysis patients using KDQOL™ 1.3 questionnaire after Arabic translation, cultural adaptation, and validation. Methods: The study included 600 predialysis patients (100 shared in the questionnaire validation) referred to the Main Alexandria University Hospital (serves four Egyptian governorates). Those with end stage renal disease, history of blood loss and consumption were excluded. Clinical and laboratory data were collected. KDQOL-SF™ was administered by investigating eligible patients. Test re-test reliability and internal consistency were estimated. Discriminant, concept, and construct validity were assessed. HRQOL data was summarized into physical, mental, and kidney disease composite summaries (PCS, MCS, and KDCS), respectively. The influence of the demographic and clinical variables on HRQOL was explored by univariate and multivariate analyses.

Results: All items of KDQOL-SF™ were reliable and reproducible except for three items in the kidney disease targeted scale with Cronbach’s α < 0.7. The study questionnaire could significantly discriminate between patients’ subgroups. There was a significant correlation between all items with overall health rate except for work status, sexual function, emotional wellbeing, and role emotional. The correlation between the disease specific items with PCS and MCS were significant for all except the sexual function with MCS. In addition, the majority of the kidney disease targeted items were significantly inter-correlated. Principal component analysis of the disease targeted scale indicated that this part of the questionnaire could be summarized into 10 factors that together explained 70.9% of the variance. Patients enrolled for assessment of HRQOL (52%males, age mean±SD 51±14 years), 28.8% and 71.2% were in stage 3 and stage 4 CKD, respectively. Anemic patients comprised 67.8%. The mean±SD of PCS, MCS, and KDCS were 33.8±9.7, 43.6±7.1, and 60.2±9.0 respectively. In univariate analysis; older, non worker, smoker, and anemic scored significantly lower for PCS, MCS, and KDCS. Female, widows, and advanced stage of CKD had significant lower PCS and KDCS scores. Diabetics and hypertensive had significant lower PCS score. In multiple linear regression, anemia was the only significant variable with the three composite summaries.

Conclusions: The Arabic KDQOL-SF™ 1.3 questionnaire was a reliable and valid tool for assessment of HRQOL. Predialysis patients reported reduced HRQOL specially with anemia.
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 immuno-suppression were exclusion criteria. TNFRE2 levels were available in 435 / 444 patients, out of whom 48 patients had diabetic nephropathy. TNFRE2 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 TNF2 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 TNF2 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 TNF2 predicted renal outcome (p=0.001; cf Figure 1); in step-wise multivariate regression analysis TNF2 (p=0.001; ExpB=0.563) remained a predictor for renal outcome after adjustment for age, CRP 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, TNF2 predicted adverse renal outcome. Because of its strong co-linearity with eGFR, TNF2 however did not confer additional prognostic information after adjustment for renal function.

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 HbA1c > 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 HbA1c only. Table 1 displays the main characteristics of the OAD patients and Figure 1 shows the frequency of the different OADs and metformin (67.2%), gliclazide (26.8%) and glibenclamide (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 gliclazide, a medication recently classified as potentially inadequate for the elderly. OAD patients with more intensive glycaemic control (HbA1c ≤ 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 patients 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 >55 mmHg and a group without morning surge (MS-), difference of 55 mmHg 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 vs 47.1±13.8, p<0.04). Target blood pressure was achieved in only 16% pts in (MS+) group and in 36% in (MS-) group. Neither the mean diurnal systolic blood pressure (133.8 ±24 vs 131.3±16 mmHg, p=0.12), nor mean night systolic blood pressure (121.8±31 vs 125.7 ±26.8 mmHg) differed significantly in both groups. (MS+) group had preserved nighttime dipping (13.4±8.6% vs 6.5±2.9%, p=0.043) and non-dipping was present in 50% of patients in (MS+) group vs 75% in (MS-) group. Serum creatinine was significantly lower in (MS+) group (1.6±1.1 vs 2.4±1.7 mg/dl, p<0.003). However, other characteristics did not differ between the groups.

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.

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 non-calcium-based) 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 collected 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: 36–62%). The proportion of patients who initiated PB treatment prior to initiation of 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 sodium-based PBs did not change 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 are pronounced 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.

Introduction and Aims: As proven, albuminuria and/or lowered estimated glomerular filtration rate (eGFR) are factors of increased cardiovascular risk and general morbidity. Until now, data on prevalence of chronic kidney disease (CKD) in Poland were based on the PolNet study conducted in one specified region. The aim of the NAPOLI 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 was 9.0% (7.8–10.4, CI 95%) and is higher in males (F 8.5% vs M 9.6%, p<0.014). It increases with age and in the age group 18 to 39 years 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 was 3.7% (F 3.5%, M 3.9%, p<0.542). 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.

Conclusions: Prevalence of CKD in population of adults in Poland aged 18-79 years is high and comparable with other countries in Europe and worldwide. Data prove CKD to be an essential problem and burden to public health in Poland.

Introduction and Aims: Hypertension is a common public health problem. Morning surge hypertension prevails in patients with chronic kidney disease (CKD). Morning surge is more pronounced in early stages of CKD 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 non-calcium-based) 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.

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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.
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 = -0.006) and male gender (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, lifestyle, 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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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 used 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 characteristic of the study group is in the table 1. The most common comorbidities were hypertension, heart failure/ischemic heart disease and diabetes respectively in 71%, 26.2% and 22.9% of the group. The most often drugs used by our patients were: hypertensive 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 (nearly every day for 30 days or longer) of any NSAIDs was reported by 5.3%. 10.1% of the studying 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 using 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.

SP231

IMPROVING ASCERTAINMENT OF CHRONIC KIDNEY DISEASE WITH LABORATORY-BASED CASE-FINDING

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Introduction and Aims: Since the introduction of CKD registers as part of the Quality and Outcomes Framework (QOF) in the UK, identification of CKD has risen substantially with marked variation in prevalence between general practices, (1.3-9.0% in our population). We hypothesised that this variation was not due to genuine differences in population CKD prevalence.

Methods: Our population is mostly served by a single laboratory. We identified all adults with any eGFR <60 mL/min/1.73m² in 2009-2012 (n=44,445) and extracted all serum creatinine results over that period. We excluded those without results >90 days apart. (n=3,087). For patients with eGFRs straddling 60 mL/min/1.73m², those with >50% of time <60 mL/min/1.73m² were classified as CKD, to mimic ‘real world’ decision-making. Patients were grouped to derive laboratory CKD prevalence (LabP)

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EFFECT ON UREMIC TOXINS ON OXIDATIVE STRESS CAUSED BY NADP 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, uremic toxicity and 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 uremic toxins on the enzymatic activity of the lymphocytic NADPH oxidase in this study.

Methods: Lymphocytes were isolated, lysed and incubated with NADPH in the presence and absence of the uremic 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 uremic toxins showed an effect on the NADPH oxidase activity. Orotic acid has been characterized as the strongest inhibitor of the NADPH oxidase. Four of the investigated uremic 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 did not show any 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 uremic toxins may fulfil a direct protective function in the development of the cardiovascular damage in patients with renal failure.

Conclusions: The results of the study demonstrate that uremic toxins may play an important role in the pathogenesis of the cardiovascular complications in chronic kidney disease by modulation of the NADPH oxidase activity.
Introduction and Aims: Based on our recent results, endemic nephropathy (EN) is now considered to be an environmental form of arthritic acid nephropathy (AAN). Importantly, during the 50 years of investigation prevalence and classification of chronic kidney disease (CKD) in any EN area was never systematically analyzed. Our aim was to determine CKD prevalence and CKD stages in Croatian EN area using 4 different formulas and compare it to non-EN area.

Methods: In this cross sectional survey we have enrolled 1573 subjects (consecutive sample, participation rate 91%, mean age 51.80±17.09); EN villages (N=1226), non-EN area (N=347). GFR was estimated using 4 formulas (C-G, MDRD, MCQE, CKD-EPI), albumin/creatinine ratio (ACR) and alpha1 microglobulin/creatinine ratio were determined from the spot morning urine sample. Blood pressure (BP) was measured following ESHand 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 anti-diabetic 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<0.0005; p<0.0005, 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<0.0005; p<0.0005; p<0.0005; p=0.0005, respectively). However, lower prevalence (%) of stages CKD 1 and 2 was found in EN area (4.4, 7.5, 5.4, 4.6 vs. 6.3, 7.4, 8.3, 6.3; p=0.001; p=0.004; p=0.0005; p=0.0005, respectively). We also failed to find differences in prevalence of ACR and alpha1/creatinine above the cut-off values between EN and non-EN (p<0.01). In both EN and non-EN areas MCQE formula significantly underestimates prevalence of CKD stages ≥2A (p<0.0005).

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 in line with the 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.
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, 139) 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, 64.7, 96.7 and 149.6 mg/d for quintiles 1, 2, 3, 4 and 5, respectively. Age and basal creatinine levels did not differ among quintiles (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 higher 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 FMF patients without documented amyloidosis. Our study points to an increased glomerular filtration rate in the group of proteinuric group, we created five subgroups with the upper cut of values of 45, 64, 75, 96 and 149 mg/dl for quintiles 1, 2, 3, 4 and 5, respectively. Age and basal creatinine levels did not differ among quintiles (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 higher creatinine clearance levels (p=0.029).end of the follow-up, patients with higher-normal proteinuria (fifth quintile) tended to have higher creatinine clearance levels (p=0.029).
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.

**SP241**

**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 abstinance from eating and drinking for periods that may exceed 18 hours with the possibility of dehydration and hypertoviscosity 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/1.73m\(^2\) 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 0.39-0.9, p=0.014). A significant rise of serum creatinine (>30%) was seen in 9 instances and was once again associated with RAAS blockade (R.R.8.3, 95% CI 1.1-62, P=0.006). Creatinine remained 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.

**SP242**

**PRE-DIALYSIS CARE AND RATE OF PROGRESSION OF RENAL DISEASE: EXPERIENCE OF AN OUTREACH RENAL PREDIALYSIS 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 initiate 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 26 (median). Therefore, rate of renal disease progression was 4.4 ml/ 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:


**SP244**

**KIDNEY PROTECTION PROGRAM IN ALEXANDRIA REGION (KIPP- ALEX): THE FIRST EDUCATIONAL PROGRAM AMONG UNDERGRADUATE MEDICAL STUDENTS TO SCREEN FOR MAJOR NON COMMUNICABLE DISEASES (NCD'S)**

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Introduction and Aims: The incidence of end stage renal disease (ESRD) is increasing in Egypt. Furthermore, the etiology of ESRD in North Africa including Egypt is mainly interstitial nephritis, glomerulonephritis and diabetes mellitus. All are mostly preventable. The early detection and prevention of progressive CKD is the principle way to reduce the burden of these chronic NCD's in our developing countries through

median at 0 month ( latest) at 12 month at 24 month

<table>
<thead>
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Table: Median at 0 month (latest) at 12 months at 24 months
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.