EPIDEMIOLOGY - RENAL OUTCOMES

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

Osama El Minshawy¹, Tawfik Ghabrah², Abdelmageed Hamza³, Abdelhafiez Fad³, Mohalab Adam³ and Eman El Bassuoni⁴
¹Internal Medicine School of Medicine, University of Tabuk Tabuk Saudi Arabia, ²Community Medicine School of Medicine, University of Tabuk Tabuk Saudi Arabia, ³Prince Sultan Kidney Center Tabuk Saudi Arabia, ⁴Physiology School of Medicine, University of Tabuk Tabuk Saudi Arabia

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)¹.⁰₆₆₆

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 formula

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Range</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>iGFR (ml/min/1.73m²)</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</td>
<td>39±16</td>
<td>7-113</td>
<td>35</td>
</tr>
<tr>
<td>eGFR MDRD</td>
<td>40±18</td>
<td>8-116</td>
<td>37</td>
</tr>
<tr>
<td>eGFR Walsor</td>
<td>37±17</td>
<td>3-97</td>
<td>3-97</td>
</tr>
<tr>
<td>eGFR Mayo Clinic</td>
<td>48±26</td>
<td>10-145</td>
<td>41</td>
</tr>
<tr>
<td>eGFR Nankivell</td>
<td>50±17</td>
<td>13-116</td>
<td>47</td>
</tr>
<tr>
<td>eGFR 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 formula

<table>
<thead>
<tr>
<th></th>
<th>within±10%</th>
<th>within±30%</th>
<th>within±50%</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tabuk formula</td>
<td>44</td>
<td>78</td>
<td>91</td>
<td>0.73</td>
</tr>
<tr>
<td>CKD-EPI</td>
<td>24</td>
<td>55</td>
<td>77</td>
<td>0.63</td>
</tr>
<tr>
<td>MDRD</td>
<td>20</td>
<td>51</td>
<td>71</td>
<td>0.58</td>
</tr>
<tr>
<td>Mayo Clinic</td>
<td>19</td>
<td>49</td>
<td>70</td>
<td>0.58</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>
</tr>
</tbody>
</table>

SP200

PROGRESSION OF CHRONIC KIDNEY DISEASE (CKD) IN THE RENAL RESEARCH INSTITUTE (RRI)-CKD STUDY

R. Saran¹, A. Tilea¹, R. Sands¹, M. Kiser⁴, S.W. Han¹, A. Stack², F. Finkelstein⁶, G. Etelé³, P. Kotanko², N. Levin² and B. Gillespie⁷
¹UM Ann Arbor MI United States, ²RRI New York NY United States, ³Uni. of Limerick Limerick Ireland, ⁴UNC Chapel Hill NC United States, ⁵Med. Col. of Albany Albany NY United States, ⁶Metabolism Associates New Haven CT United States

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 demographics, 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 via 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 five 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 Children with CKD Study). To this end, prior to start study, 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. Biomatierals are processed according to best pre-analytical methods for routine analyses in the core laboratory and samples are taken, where possible, in a fasting state. Biomaterials are processed and processed.

Conclusions: The network of German Kidney Cohorts is establishing a prospective observational study cohort of 17,000 patients. This will expedite future research on factors involved in the initiation and progression of CKD and its complications.

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 exist 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 undergoing 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 Brochner-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 different derived variables.

Results: The mean mGFR for this population was 92.0 +/- 14.1 mls/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 CG bias 21.3 (23.7), -25 to +67 mls/min. mGFR to CKD-Epi bias 12.2 (19.3), -25 to +50 mls/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.

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

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.
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 their eGFR was 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 on 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.

**SP201**  
**EFFECT OF REEVALUATION OF LIFESTYLE ON DECLINE IN ESTIMATED GFR AMONG HIGH RISK POPULATION OF CHRONIC KIDNEY DISEASE: FROM THE RESULTS OF THE KIDNEY EARLY EVALUATION PROGRAM IN JAPAN**

Mitsuru Yanai1, Kazuyoshi Okada1, Kazuhisa Takeuchi1, Kazuhito Matsuya1, Kosaku Nitta1, and Tsuru Nakaya1

1International Kidney Evaluation Association Japan Tokyo Japan

**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 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:** 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 values without DM or >130/85 mmHg in participants with DM, OR 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.

**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.

**SP205**  
**COGNITIVE AND KIDNEY FUNCTION AT AGE 60-64 YEARS: RESULTS FROM THE 1946 BRITISH BIRTH COHORT STUDY**

Richard J. Silverwood1, Marcus Richards2, Mary Piercy3, Rebecca Hardy2, Naveed Sattar2, Charles Ferro4, Caroline Savage5, Diana Kühn6 and Dorothea Nitsch7

1Department of Non-Communicable Disease Epidemiology London School of Hygiene and Tropical Medicine London United Kingdom, 2MRC Unit for Lifelong Health and Ageing University College London London United Kingdom, 3BHF Glasgow Cardiovascular Research Centre University of Glasgow Glasgow United Kingdom, 4Department of Renal Medicine Queen Elizabeth Hospital Birmingham Birmingham United Kingdom, 5School of Immunity and Infection. College of Medical and Dental Sciences University of Birmingham Birmingham United Kingdom

**Introduction and Aims:** Previous studies have found associations between cognitive function and chronic kidney disease. We aimed to test this association and explore possible explanatory mechanisms.

**Methods:** The MRC National Survey of Health and Development is a socially stratified sample of 5362 children born in March 1946 in England, Scotland and Wales, and followed up since. At age 60-64 years 2036 study members with complete data were analysed. Cognitive function at age 60-64 years was quantified using five measures (verbal memory, letter search speed, letter search accuracy, simple reaction time and choice reaction time) and kidney function at the same age was measured using cystatin C. The cross-sectional association between cognitive and kidney function was sequentially adjusted for a priori confounding factors (socioeconomic position and educational attainment), prior cognition, then potential explanatory mechanisms (lifetime smoking trajectory, current body mass index, systolic blood pressure and C-reactive protein).

**Results:** Cognitive function was strongly and mainly linearly associated with cystatin C. For example, the highest quartile of verbal memory corresponded to a 0.047 (95% confidence interval 0.030, 0.064) mg/L improvement in cystatin C relative to the lowest quartile. The association operated in a quadratic form in choice reaction time.

**Conclusions:** Cognitive and kidney function in late mid-life are associated even at only minor kidney function impairment. The implications for clinical care are profound and under-researched. Further studies are required to elucidate fully the mechanisms by which this association operates.

**SP204**  
**CUTToMEOR Cystatin C-BASED EQUATIONS TO ESTIMATE GLOMERULAR FILTRATION RATE IN THE GENERAL POPULATION: IMPACT ON THE EPIDEMIOLOGY OF CHRONIC KIDNEY DISEASE**

Pierre Delanaye1, Etienne Cavaler1, Olivier Moranne2, Laurence Lutteri1, Olivier Bruyère1 and Jean-Marie Krzesinski1

1University of Liège Liège Belgium, 2University of Nice Nice France

**Introduction and Aims:** Chronic kidney disease (CKD) is a major issue in public health. Its prevalence has been calculated using the creatinine-based equations such as the Modified Diet in Renal Disease (MDRD) study and Chronic Kidney Disease Epidemiology Collaboration study (CKD-EPI) equations for estimating glomerular filtration rate (GFR). Recently, new equations based either on cystatin C (CKD-EPI Cys) or both cystatin and creatinine (CKD-EPI mix) have been proposed by the CKD-EPI consortium. The aim of the study was to measure the difference in the prevalence of CKD, defined as estimated GFR below 60 ml/min/1.73 m², in a population using these different equations.

**Methods:** CKD screening is performed in the Province of Liège, Belgium. On a voluntary basis, people over 50 were invited to be screened. GFR was estimated by the four equations. CKD was defined as GFR under 60 ml/min/1.73 m². Serum creatinine was measured by the IDMS traceable compensated Jaffe method (Roche Diagnostics, Mannheim, Germany) on Modular apparatur. 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 ± 9.9). 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:** 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.
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-IS: 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-IS 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-IS 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-IS 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-IS 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-IS 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.

Introduction and Aims: Chronic kidney disease (CKD) affects 10-15% of the U.S. population. Progression to end stage renal disease (ESRD) and its complications lead to early death, disability, poor quality of life, and high economic costs. Attention 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 groups 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.
SURVIVAL OF MAINTENANCE HEMODIALYSIS PATIENTS

Methods: In a cohort of hemodialysis (HD) patients an appearance of depression/anxiety symptoms, chronic pain, although frequent among HD patients did not lower survival. Depressive symptoms are an important predictor for all-cause mortality in HD patients. Reporting bias might cause this phenomenon in male. After the male subjects were divided into quintile as following BMI, in more than 3 months, the lowest quintile had higher prevalence of depression compared with the highest quintile.

Conclusions: Exercise habitant might ameliorate the incidence of proteinuria.

EDUCATING 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 decisions 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. 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 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 program 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 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 program 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.
A NOVEL APPROACH TO MANAGING CHRONIC KIDNEY DISEASE: REMOTE MONITORING

Ing Elsayed1, Arif Khwaja1, Sue Seddon3 and Frances Mortimer2
1 Renal Medicine Sheffield Teaching Hospitals Sheffield United Kingdom, 2 Center 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 individualised 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 plans. 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 difference between the patients’ eGFR over 2 years before and 12 months after implementation of DMP, with their mean 28.795(CI, 28.27-29.14) & 28.55(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 representing 27% of the total Medicare budget. Our pilot data suggests that remote monitoring of CKD is deliverable, clinically safe in selected patients, improves patient satisfaction and empowerment whilst delivering significant carbon savings. With prevalence of CKD increasing with an ageing population, remote monitoring of CKD may be a more sustainable model of delivery of care.

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

Minoru Ando1, Masaki Harai1, Ken Tsuichiy1 and Kosaku Nitta1
1 Department of Internal Medicine Tokyo Women’s Medical University Shinyaku-Ku Tokyo Japan

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, is more common than generally thought.

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 drugs 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/1.73m2. 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 10^3/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/1.73m2, with mean decrease ratio of 16.2 ± 16.9% (< 0.0001). The cumulative incidence of renal dysfunction was 26.4%, and eGFR of affected participants reduced from 88.9 ± 19.3 to 53.7 ± 16.8 ml/min/1.73m2. The factors associated with incidence of renal dysfunction were: Men (OR, 3.98; 95% CI, 1.34 - 11.64), 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 - 8.63). 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

Akira Higawashi1, Masahiro Hagiwara1, Suyoshi Tsurusako1, Joichi Usui1, Kel Nagai1, Hirayasu Kai1, Naoki Morito1, Che Salo1, Keigo Yoh1, Michiroko Hosojima1, Akiko Salo2 and Kunihiro Yamagata1
1 Nephrology University of Tsukuba Tsukuba Ibaraki Japan, 2 Clinical Nephrology and Rheumatology University of Nigata Chuo-ku Nigata Japan

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 studied inulin and p-aminohippuric 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 thirty consecutive days in 29 patients.

Results: We separated the subjects with their GFR as follows; Group 1(n=54); GFR=50ml/min/1.73m2, Group 2(n=37); GFR=30-50 ml/min/1.73m2, Group 3 (n=24), 15<KFR<30 ml/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,rS=0.25,P=0.008). Average daily excretion of soluble megalin was10.55±9.39pmol/day and this was decreased with GFR reduction.

Conclusions: Megalin is abundantly located at epithelium of proximal tubules. 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.

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

Austin G. Stack1,2, Tetyana Chernenko3, Ahmad A. Abdalla1,2, Rajiv Saran3, Hoang T. Nguyen1, Elizabeth Hedgeman1, Alish Hanigan1 and Liam F. Cassidy1
1 Nephrology and Internal Medicine Graduate Entry Medical School, University of Limerick Limerick Ireland, 2 Nephrology and Internal Medicine University Hospital Limerick Limerick Ireland, 3 Kidney Epidemiology and Cost Centre, School of Public Health University of Michigan Ann Arbor MI Ireland

Introduction and Aims: Early detection of chronic kidney disease (CKD) and subgroup who are most likely to progress is an essential part of preventive healthcare,
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-SF™ 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 or transfusion events but not with all-cause death.

Results: The study sample includes 1943 patients. Mean age was 70.7±12.8 years, 53.8% were females and 48.2% had no reduction in eGFR over 3 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 serum creatinine (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 Irish population, 15% experienced an accelerated decline in kidney function. This high risk population could be easily be identified and characterised from a passive disease surveillance system.

Baseline Serum Uric Acid Levels and Cardiovascular Outcomes in Patients with CKD

SP220

Elena Sestigiani1, Dario Tedesci2, Marcora Mandreoli1, Giulia Ubaudi1, Fabio Olmeda3, Mattia Monti1, Paola Ruccii1, Dino Gibertoni2 and Antonio Santosor1

1Nephrology Dialysis and Hypertension, S.Orsola-Malpighi Bologna Italy, 2Dept of Biomedical and Neuromotor Sciences Bologna Italy, 3Nephrology and Dialysis, Ospedale Policlinico Modena Italy, 4Nephrology and Dialysis, Ospedale S Maria delle Croci Ravenna Italy

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. Multivariable analyses were adjusted for age, gender, baseline CKD stage, allopurinol treatment, diabetes, cholesterol level, urinary proteins, blood pressure, previous CV events.

Results: 1943 study sample includes 1835 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. Among 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.

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 analysed 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 (R2=0.42, p<0.01). Primary and secondary glomerulonephropathies (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

Kyrill S. Rogachev, Sarah Steiker, Adam M. Zawada, Danilo Fisler and Gunnar H. Hein1

1Nephrology & Hypertension Saarland University Medical Center Homburg Germany

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 univariable 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, 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, TNFR 2 predicted adverse renal outcome. Because of its strong co-linearity with eGFR, TNFR2 however did not confer additional prognostic information after adjustment for renal function.

---

SP223

ORAL ANTIDIABETIC THERAPY AND KIDNEY FUNCTION IN THE BERLIN INITIATIVE STUDY

Antonios Douros1, Elke Schaeffner2, Olga Jakob2, Reinhold Kreutz1 and Natalie Ebert2

1Clinical Pharmacology and Toxicology Charité Berlin Germany, 2Nephrology Charité Berlin Germany

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, with metformin (67.2%), glidepiride (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 glimepiride, 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

Biljana Gerasimovska Kitanovska1, Stëvka Bogdanovska1, Galina Severova Andreevska1, Vesna Gerasimovska1 and Aleksandar Skole1

1Department of Nephrology University Clinical Centre Skopje The former Yugoslavia Republic of Macedonia

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-DOQI 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 two hours after waking.

Results: Level of morning surge was significantly different between groups with and without morning hypertension. morning surge was higher in patients with morning hypertension compared to patients without morning hypertension (p<0.05).

Conclusions: Our results show that morning surge is more pronounced in patients with morning hypertension.
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 47.4±13.8; p=0.04). Target blood pressure was achieved only in 16% pts in (MS+) group and in 36% in (MS-) group. Neither the mean diastolic systolic blood pressure (153.8 ± 24 vs 131.16 mmHg; p=0.02), nor mean nighttime BP (135.7 ± 25.3 vs 168.1 ± 23.6 mmHg) differed significantly in both groups. (MS+) group had preserved nightly dipping (13.4±6.9% vs. 65%±2%, 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 the MS+ group (1.62±0.8 mg/dl vs 2.47±0.93 mg/dl, p=0.001). Renal function was better preserved in (MS+) group. Other blood parameters (other than CKD) was less present in the (MS+) group (60 vs. 85%, chi-square test; p=0.003). In a model of multiple logistic regression, when morning surge was used as a dependent variable, and presence of proteinuria, presence of dipping, gender, presence of left ventricular hypertrophy and target organ damage other than CKD, as independent variables, 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**

Viatcheslav Palkov1 and Frank Schiepe1
1Vifor Pharma Glattbrugg Switzerland

**Introduction and Aims:** Hyperphosphataemia 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 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 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.

**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 treatment 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 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.

---

**SP226**

**PREVALENCE OF CHRONIC KIDNEY DISEASE IN POLAND**

Boleslaw Rutkowski1, Tomasz Zdrojewski2, Piotr Bandosz2, Lukasz Zdrojewski1, Marcin Rutkowski1, Zbigniew Gaciong3, Bogdan Solnica4, Tadeusz Jedrzejczyk5, Boleslaw Rutkowski1, Tomasz Zdrojewski2, Piotr Bandosz2, Lukasz Zdrojewski1, Marcin Rutkowski1, Zbigniew Gaciong3, Bogdan Solnica4, Tadeusz Jedrzejczyk5, Ewa Krol1 and Bogdan Wyrzykowski2
1Department of Nephrology, Transplantology and Internal Medicine Medical University of Gdansk Gdansk Poland, 2Department of Hypertension and Diabetology Medical University of Gdansk Gdansk Poland, 3Department of Internal Medicine, Hypertension and Angiology Medical University of Warsaw Warsaw Poland, Jagiellonian University Medical College Krakow Poland, Academic Clinical Center, the Medical University of Gdansk Hospital Gdansk Poland

**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 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 urinal 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 (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 (F 3.5% M 3.7%; CI 95% 0.1%; p=0.01) was 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.
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 < 5.5%), normal (5.5-11.1%), 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 = 0.0021) 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 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.

Introduction and Aims: Self-esteem is a good indicator of Mental Health. The Rosenberg Self-Esteem Scale (RSES), is one of the tools validated for this purpose and has been used since 1965 in more than 53 countries. But we have no studies have evaluated the level of esteem in patients in Hemodialysis (HD), or the possible factors associated with it. Objective: Evaluation of self-esteem and analysis of possible factors that may influence this, in HD patients in outpatient dialysis centers.

Methods: We performed a descriptive cross-sectional study conducted in May 2011. Clinical nurses with more than one year of experience in HD, assessed the level of self-esteem in patients 3 type HD centers in Chile. The patients gave informed consent to participate in the study. RSES was applied consisting of 10 statements of feelings a person has about herself, 5 positive and 5 negative addressed. Graduation has 4 points (1 strongly disagree, 2 = disagree, 3 = agree and 4 = strongly agree) and assigns the reverse score negatively addressed claims, the theoretical values range from 10 (low self-esteem) to 40 (high esteem). It is a self-administered scale where participants mark an X over the alternatives identified. Design is also a specific record that identified the following variables: age, sex, years of HD, patient cohabitation (living alone, living with relatives, lives in Shelter), Vascular Access Type fistula (Native or Prosthetic) or Catheter (temporary or tunneled), dependency patient (Delta Test), hematocrit, albumin, and Kt / V. Statistical analysis of individual variables was performed through a 2x2 contingency table, using the chi-square test for analysis of statistical significance.

Results: We applied the RSES in 150 patients in HD. Esteeem Level Number (%): Normal 100 (67%), Media 30 (20%), Low 20 (13%). Gender: Male 79 (52%), Age: 60,9 years. Time on HD (months) 50 (1-272), Vascular Access: Fistula: 115 (76.5%) Catheter: 35 (23.5%), Hematocrit: 31.5 ± 5.0%, Albumin: 3.8 ± 0.2 g/dL, Kt / V 1.5 ± 0.4, Cohabitation Patient: Lives with relatives: 138 (92%), Live alone: 7 (4.7%), Live House: 5 (3.3%), Cohabitation Patient Lives with relatives: 138 (92%), Live alone: 7 (4.7%), Live House: 5 (3.3%), Severe: 1 (1%) Statistical analysis showed a significant association (p < 0.05) between RSES and variables: Gender (Male / Female) OR = 2.159 (95% CI: 1.080 to 4.312) and time on HD in ranges of <1 year in HD versus ≥ 1 year ≤ 5 years OR = 16.851 (95% CI: 2.168 to 130.962) and ranges of <1 year in HD versus >5 years OR = 14.667 (95% CI: 1.539 to 139.795).

Conclusions: The study established that in these type units outpatient HD, most HD patients have good self-esteem. The lowest level of self-esteem was found in male patients, especially during the first year of entry into HD. Probably psychological type supports slated to focus on this particular group. Further studies are needed to evaluate multi-type self-esteem in both HD patients, and the factors that influence it.
for each practice, and compared with reported QOF prevalence (QOFP) for the same period. Prevalence was then standardised by age and gender using LabP and compared with deprivation, list size and rurality. Results: The LabP for our population was 5.76% (female 7.24%, male 4.2%), range from 0.11% to 8.29% (IQR 5.19, 6.35). QOFP and LabP are strongly correlated (r=0.74, p<0.001), but there is a higher variance in QOFP. In 2011, LabP was higher than QOFP by 0.29% (95% CI 0.01, 0.57%). In 2012, QOFP rose and the difference was reversed to -0.14% (95% CI -0.41, -0.13). Relative difference ((QOFP-LabP)/QOFP) was correlated to QOFP (r=0.60, p<0.01) but not to list size or rurality, suggesting practices reporting high prevalence rates tend to overestimate and vice versa. Prevalence was strongly correlated with deprivation (r=0.68, p<0.01), but not rurality or practice list size. Conclusions: CKD 3-5 is predominantly a laboratory diagnosis. In 2011, there were 1000 CKD patients not on the register. In 2012, QOFP is similar to LabP, but with significant inter-practice variation. Additionally, some individuals are erroneously labelled with CKD, and may be subject to unnecessary monitoring. Our study reveals a weakness in the QOF registers which can be improved through centralised laboratory reporting. The prevalence of CKD is associated with deprivation which may be due to the ‘inverse care law’.

**SP232**

EFFECT ON UREMIC TOXINS ON OXIDATIVE STRESS CAUSED BY NADP OXIDASE ACTIVITY

Vera Jankowski1, Anna Schulz1, Walter Zidek1 and Joachim Jankowski1
1Med. Clinic IV Charité-Universitaetsmedizin Berlin Berlin Germany, 2Charite Berlin Germany

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 caused by NADPH oxidase activity 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. Thirty five of the uremic toxins decreased 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 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 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.

**SP233**

SERUM URIC ACID LEVEL AND LONG TERM SURVIVAL IN DIALYSIS PATIENTS

Jana Holmar1, Ivo Fridolin1, Fredrik Uhl2, Merike Luman3 and Anders Fenstrom2
1Department of Biomedical Engineering Tallinn University of Technology Tallinn Estonia, 2Department of Medical and Health Sciences, Department of Nephrology UHL Linköping University Linköping Sweden, 3Centre of Nephrology North Estonian Medical Centre Tallinn Estonia

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 J-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). Figure 1 Survival analysis of dialysis patients participated in the study (log-rank test = 5.14; p=0.03).

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. Friend, 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 dependence 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 independents 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. 41 (10-140) mg/L,p=0.004). There was no significant differences in nutritional biomarkers, except cholesterol levels, which were lower in the CC formula (185±59 vs. 300±59 mg/dl, p=0.005); “inverse epidemiology”. The Hb was higher in patients on CC (12, 9± 0.9 vs. 12 ± 1.2 g/dl, p=0.018), with the same erythropoetin per week. The number of hospitalization was higher in patients with ITD. In survival analysis there were no significant differences between both 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.

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 a Croatian rural area. Prevalence of end stage renal-enzyme (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) and alpha1-microglobuline/creatinine ratio were determined from the 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, 1.8, 6; 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, 5.6; p=0.0001; p=0.004; p=0.0001; p=0.0001, respectively). We also did not 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 underestimate 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.

Introduction and Aims: Based on our recent results, endemic nephropathy (EN) is now considered to be an environmental form of arthostolic acid nephropathy (AAN). Interestingly, 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-microglobuline/creatinine ratio were determined from the 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). 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, 1.8, 6; 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, 5.6; p=0.0001; p=0.004; p=0.0001; p=0.0001, respectively). We also did not 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 underestimate 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.
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, 96.7 and 149.6 mg/dL for quintiles 1, 2, 3, 4 and 5, respectively. Age and basal creatinine levels did not differ among fifths (p=0.459, p=0.311 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). Conclusions: This is the first study, which investigates the possible renal adverse outcomes of high-normal proteinuria in CKD 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 hypertension, which predispose chronic renal insufficiency.
SP241 FASTING THE MONTH OF RAMADAN FOR PATIENTS WITH CHRONIC KIDNEY DISEASE: IMPACT ON KIDNEY FUNCTION AND CARDIOVASCULAR OUTCOMES

Mohamed M. NaarAlah1 and Noha Osman1
1Internal Medicine, Nephrology Unit Kasr Al-Ainy School of Medicine, Cairo University Cairo Egypt

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 abstainence 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 clinical data and follow up for major cardiovascular events were recorded (defined as acute coronary syndrome, stroke and transient ischemic attack). A rise of serum creatinine was noted during the fasting period in 50% of all patients. 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 fixed calcium channel blockers (R.R. 0.6, 95% CI 0.36-0.9, p=0.014). A significant rise of serum creatinine (>30%) was seen in 9 instances and was once again associated with RAAS blockers (R.R.8.3, 95% CI 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 had an episode of acute coronary syndrome. 5 patients in the fasting group had major cardiovascular events during follow up which was higher than controls (p=0.002).

Results: Patients completing follow up of 52 fasting months and 54 non-fasting months 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 blockers (R.R.8.3, 95% CI 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 had an episode of acute coronary syndrome. 5 patients in the fasting group had major cardiovascular events during follow up which was higher than controls (p=0.002).

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 PRE-DIALYSIS SERVICE

Orod Osanlu2, Amanda B. Greer1, Hillary Morgan1, Thomas Archer1, Noeleen Ryan1, Atif Khalil1 and Shahed Ahmed1
1Internal Medicine, Nephrology Unit Kasr Al-Ainy School of Medicine, Cairo University Cairo Egypt, 2Department of Medicine Warrington Hospital Merseyside United Kingdom

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 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) and at 24 months eGFR was 22.6 (mean) and 20 (median). Therefore, rate of renal disease progression was 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 patients 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:

SP243 KEEP IN INDIA

Sreelatha Meelamadistha1 and Arun Vajiyarambhat Ashok1
1Nephrology Govt. Medical College, Kozhikode Kozhikode Kerala India

Introduction and Aims: Kidney diseases are increasing all over the world and in India, because of increasing burden of Type 2 Diabetes & Hypertension. Once the patient goes into CKD stage 5, Dialysis &Transplantation are available only for a minority of these patients, which is an economic burden to the family, society & Nation. The rest 90% are dying of CKD. The only solution to this is prevention of kidney diseases.

Screening & early detection of kidney diseases & awareness programmes are definitely helpful to prevent progression of kidney diseases. Aim of the study 1. To find out the prevalence of kidney diseases in Northern districts of South India 2. To find out newly detected kidney diseases by screening programmes. 3. To evaluate the usefulness of awareness classes in local language.

Methods: A prospective study conducted over a period of 1 year from June 2011 to July 2012. Screening camps were conducted in different districts of North Kerala with the help of socially active clubs. Detailed history, BP, BMI, Urinalysis for protein, microalbumin, blood, WBC were done. Serum uric acid was checked for those with Diabetes, Hypertension or BMI>25. All those with abnormal urinalysis will be called to nephrology OPD for further evaluation and treatment. Along with screening camps awareness classes regarding various aspects of kidney diseases were given. Before the class awareness among the people regarding kidney diseases were tested using preformed questionnaires. The same population were interviewed after 3 months to assess the improvement in awareness.

Results: During the last year, 4840 people were screened. Male to female ratio was 1:1.7. Age group -<20 years -5%, 20-40 years - 21%, 40-60 years 49%, >60 years 25%. Prevalence of kidney disease as detected by any urinary abnormality was 12.3%. Of this, only 4.8% were already known to have kidney disease. Commonest urinary abnormality was proteinuria (66%) followed by microalbuminuria (15%). Of the 12.3% of patients with urinary abnormalities, 76% were with type 2 DM, 34% were with hypertension and the rest with other causes. Kidney disease awareness status was 24.8% prior and it improved to 69.4% after the awareness classes.

Conclusion: 1. Overall prevalence of kidney disease was 12.3% in the population studied. 2. Majority of the were unaware about their kidney disease. 3. Awareness program definitely improved the knowledge about kidney diseases.

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)

Hala S. El-Wakil1, Samir H. Asaad1, Mouftaha M. Nawar2, Ahmed G. Adam1 and Mona M. Abdel-Gawad2
1Internal Medicine Department Faculty of Medicine, Alexandria University Alexandria Egypt, 2Cardiology Department Faculty of Medicine, Alexandria University Alexandria Egypt

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 NCDs in our developing countries through


Downloaded from https://academic.oup.com/ndt/article-abstract/28/suppl_1/i140/1838461 by guest on 30 March 2019
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.