Getting the most from nephrology outpatients: Delta eGFR an intuitive method of assessing progression and regression of chronic kidney disease (CKD)


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decided to analyze the rate of progression of CKD in a population followed by a multidisciplinary team.

Methods: We analyzed data from 209 patients (102 females) referred to the Nephrology Division, after at least 6 months under treatment by a multidisciplinary team (nephrologist, nutritionist, nurse and psychologist) patients were followed from January of 2002 until December of 2005. Glomerular filtration rate was estimated by MDRD equation (eGFR). Patients with eGFR below 15ml/min were excluded, and this value was considered the end-point for calculation of the rate of decline of renal function. Results are means: ±SD.

Results: Hypertension was the main cause of CKD (31%) followed by Diabetes (26%). Age was 60±15 years, body mass index was 27±5 kg/m² for females and 26±4 kg/m² for males. Serum calcium, phosphorus and albumin were normal. Urea was 71±36mg/dl, eGFR = 38±20 ml/min. Systolic arterial pressure was 137±20mmHg and diastolic 80±11mmHg; hematocrit = 37±5%; hemoglobin =12.3±1.7g/dl; cholesterol = 194±42mg/dl, HDL-cholesterol= 36±11mg/dl, LDL-cholesterol 119±54mg/dl; triglyceride = 167±106 mg/dl; iPTH= 22±221 pg/ml.

From the studied population 58% was referred treatment with eGFR = 45-50 ml/min, and the remaining with eGFR =29 to 15 ml/min. K/DOQI suggests a decline of 4ml/min/year for CKD patients. As shown in Table1, the rate of decline of eGFR of the present population was below this level, meaning an extra gain of time per year free from dialysis as a consequence of the conservative management with a multidisciplinary team.

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Table 1. Progression of CKD

<table>
<thead>
<tr>
<th>Baseline disease</th>
<th>Initial eGFR (ml/min)</th>
<th>GFR reduction (ml/min/year)</th>
<th>Time expectation in conservative management (yrs)</th>
<th>Time gain/year in conservative management (yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>40.48</td>
<td>2.88</td>
<td>8.85</td>
<td>0.62</td>
</tr>
<tr>
<td>Hypertension</td>
<td>35.41</td>
<td>0.89</td>
<td>23.05</td>
<td>0.78</td>
</tr>
<tr>
<td>Others</td>
<td>46.21</td>
<td>1.23</td>
<td>25.42</td>
<td>0.69</td>
</tr>
</tbody>
</table>

Conclusions: The present data show that a late referral population, did not show complications of uremia, and the rate of decline of GFR was lower than suggested by K/DOQI. We concluded therefore that, if followed by specialists and if possible by a multidisciplinary team, retarding the progression of CKD even in its more advanced stages is possible. Therefore conservative management is an efficient way to maintain CKD patients and to postpone renal substitutive therapy. Finally we believe that programs aiming this treatment should be encouraged to ameliorate care of CKD patients.

Epidemiology of CKD 1

FP158 ETHNIC DIFFERENCES IN PREVALENCE OF HEMATOLOGICAL AND METABOLIC ABNORMALITIES BY GFR STAGE

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Introduction and Aims: Biochemical and hematological abnormalities increase in severity and prevalence by stage of GFR. The evidence to date is based on NHANES data from a US cohort of white, black and Hispanic ethnicities. Using a provincial database in which all patients referred nephrologists are registered when GFR < 60ml/min, we undertook to describe the prevalence of abnormalities by ethnicity within different levels of GFR.

Methods: British Columbia is a population of 4 million people, with mixed ethnicities including Caucasian, Oriental Asian, South Asian and First Nations individuals. Between 2000 and 2006, we examined a registered cohort of 5968 pts who had GFR < 60 ml/min/1.73 m², to determine the prevalence of abnormalities in hemoglobin, calcium, phosphate, iPTH, albumin and bicarbonate at the time of registration. Cut-off points were selected based on the lower or upper limit of the lab normal range. GFR was calculated using the abbreviated MDRD formula, and using categories of <15, 15-30, 30-45 and 45-60 ml/min.

Results: The mean age of our cohort was 66; 57% were male, and 38% were diabetic. The proportion of patients within each category of GFR was similar by ethnicity: Caucasian 65-77%, Asian Oriental 8-17%, South Asian 7-10%, Other 3-6%. Table 1 describes the prevalence (%) of abnormalities of hematological and metabolic abnormalities by ethnicity and level of GFR. Note that there is statistically different prevalence of abnormalities within stages of GFR between Caucasians and Asian Orientals in particular.

Table 1. Prevalence of hematological and metabolic abnormalities by ethnicity and GFR level

<table>
<thead>
<tr>
<th>GFR Level</th>
<th>Caucasian</th>
<th>Asian Oriental</th>
<th>South Asian†</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>4301</td>
<td>820</td>
<td>552</td>
<td>295</td>
</tr>
<tr>
<td>Age (yrs)</td>
<td>67±15</td>
<td>67±16</td>
<td>60±17</td>
<td>56±18</td>
</tr>
<tr>
<td>Male (%)</td>
<td>59</td>
<td>52</td>
<td>54</td>
<td>51</td>
</tr>
<tr>
<td>Diabetes (%)</td>
<td>38</td>
<td>28</td>
<td>27</td>
<td>46</td>
</tr>
<tr>
<td>GFR</td>
<td>26.5±13.1</td>
<td>22.7±13.2</td>
<td>24.1±13.2</td>
<td>23.6±13.8</td>
</tr>
<tr>
<td>Hg &lt;120 g/L</td>
<td>[45 - 60]</td>
<td>31*</td>
<td>43</td>
<td>30</td>
</tr>
<tr>
<td>[30 - 45]</td>
<td>39</td>
<td>49</td>
<td>48</td>
<td>59</td>
</tr>
<tr>
<td>[15 - 30]</td>
<td>52</td>
<td>58</td>
<td>63</td>
<td>61</td>
</tr>
<tr>
<td>&lt;15</td>
<td>64</td>
<td>64</td>
<td>55</td>
<td>60</td>
</tr>
<tr>
<td>Ca &lt;2.1</td>
<td>[45 - 60]</td>
<td>8</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>[30 - 45]</td>
<td>6</td>
<td>15</td>
<td>7</td>
<td>17</td>
</tr>
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<td>[15 - 30]</td>
<td>3</td>
<td>21</td>
<td>16</td>
<td>28</td>
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<tr>
<td>&lt;15</td>
<td>14</td>
<td>25</td>
<td>16</td>
<td>35</td>
</tr>
<tr>
<td>P04 &lt;1.4</td>
<td>[45 - 60]</td>
<td>14</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>[30 - 45]</td>
<td>18</td>
<td>32</td>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td>[15 - 30]</td>
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<td>42</td>
<td>49</td>
<td>47</td>
</tr>
<tr>
<td>&lt;15</td>
<td>57</td>
<td>55</td>
<td>59</td>
<td>57</td>
</tr>
<tr>
<td>iPTH &gt;6.8</td>
<td>[45 - 60]</td>
<td>39</td>
<td>53</td>
<td>47</td>
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<tr>
<td>[30 - 45]</td>
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<td>73</td>
<td>67</td>
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<tr>
<td>[15 - 30]</td>
<td>66</td>
<td>66</td>
<td>76</td>
<td>69</td>
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<td>&lt;15</td>
<td>65</td>
<td>74</td>
<td>79</td>
<td>71</td>
</tr>
<tr>
<td>ALB &lt;35 g/L</td>
<td>[45 - 60]</td>
<td>16</td>
<td>23</td>
<td>12</td>
</tr>
<tr>
<td>[30 - 45]</td>
<td>15</td>
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<td>33</td>
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<tr>
<td>[15 - 30]</td>
<td>23</td>
<td>32</td>
<td>32</td>
<td>37</td>
</tr>
<tr>
<td>&lt;15</td>
<td>42</td>
<td>44</td>
<td>25</td>
<td>45</td>
</tr>
<tr>
<td>HCO2 &lt;20</td>
<td>[45 - 60]</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>[30 - 45]</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>17</td>
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<td>[15 - 30]</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>&lt;15</td>
<td>13</td>
<td>13</td>
<td>16</td>
<td>15</td>
</tr>
</tbody>
</table>

1Asian Indian and Filipino, *indicates statistically significant compared to Caucasian

Conclusions: This is the first report of differential prevalence of well-known renal associated abnormalities by ethnicity within a patient cohort in a universal access health care system. Improved understanding of these differences are important in order to understand the paradoxical finding of better prognosis for Asian Orientals on dialysis. These findings indicate that this occurs in spite of worse metabolic and hematologic abnormalities at earlier stages of CKD. Questions around race specific GFR and related laboratory test cut-offs should be pursued.

FP159 PREDICTORS OF NEW-ONSET KIDNEY DISEASE IN A GENERAL MIDDLE-EUROPEAN POPULATION

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Introduction and Aims: Established cardiovascular risk factors are associated with end-stage renal disease (ESRD) with hypertension and diabetes being the leading causes. The aim of this study was to identify risk factors at an earlier stage of kidney disease with the belief that interventions could prevent or delay the progression to ESRD as well as cardiovascular disease. Predictors of new-onset kidney disease have not been thoroughly studied.

Methods: Since 1990 the general population of Vienna was invited to yearly preventive medical checkups within the ongoing Vienna Health Study. Until 2005, 24,689 apparently healthy volunteers (44% women, age range 20-84 years, men 20-89 years) could be assessed longitudinally. They performed a baseline examination at any time within the study period and were subsequently invited to a follow up examination once a year,
but no preset time intervals for the follow up examinations could be demanded imperatively. Within the follow up period, there were a mean of 3.09 individual follow up examinations performed, each individual’s mean follow up period was 5.66 years and the mean longest follow up period was 7.44 years. Primary outcome of interest was the development of kidney disease defined as a decrease of glomerular filtration rate (GFR) < 60 ml/min/1.73 m² (calculated by the abbreviated Modification of Diet in Renal Disease (MDRD) -equation) at the follow up examinations. Covariates included age, sex, GFR, body mass index, sports (endurance exercise ≥ 2 times/week), smoking status, total-, HDL-, LDL-cholesterol, triglycerides, uric acid, fasting serum glucose, systolic and diastolic blood pressure, diagnosis of hypertension categories, and diabetes mellitus. A multivariable logistic generalized estimating equations model (taking into account the dependence between repeated measurements within the same individual at different follow up periods) was performed with respect to statistical significance resulting from univariate analysis of the covariates adjusted for age and sex. Variables were retained if Wald tests gave a P < 0.001.

Results: The following parameters presented as odds ratios (OR) with 95% confidence intervals predicted new-onset kidney disease: Age (increase of 5 years), OR=1.35 (1.33 to 1.37); sex if female, OR=1.91 (1.70 to 2.16); MDRD-GFR > 90 ml/min/1.73 m² vs. 60-89 ml/min/1.73 m², OR=0.54 (0.50 to 0.73); sports, OR=0.64 (0.57 to 0.73); smoker, OR=1.69 (1.54 to 1.85); ex-smoker, OR=1.38 (1.22 to 1.56); uric acid (increase of 2 mg/dl), OR=1.71 (1.60 to 1.83); hypertension stage 1, OR=1.78 (1.60 to 1.99); hypertension stage 2, OR=2.28 (1.99 to 2.61); diabetes mellitus, OR=1.52 (1.11 to 2.10).

Conclusions: Established cardiovascular risk factors predicted new-onset kidney disease. The impact of sex should be interpreted retentive, since sex appears in the numerator of the MDRD-equation. Higher GFR at baseline and sports were revealed as probably protective.

FP160 CHRONIC KIDNEY DISEASE AND MORTALITY AND MORBIDITY AMONG PATIENTS WITH ESTABLISHED CARDIOVASCULAR DISEASE: A COMMUNITY-BASED COHORT STUDY

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Introduction and Aims: The importance of chronic kidney disease as an independent risk factor for morbidity and mortality in patients with cardiovascular disease in the community is not widely recognised.

Methods: A retrospective cohort study based in the West of Ireland followed a randomised practice-based sample of patients with cardiovascular disease. A database of 1,609 patients with established cardiovascular disease was established in 2000. This was generated from a randomised sample of 35 general practices in the West of Ireland. The primary end point was death from any cause. The secondary endpoint was a cardiovascular composite endpoint (Log Rank (Mantel-Cox) 56.97, p < 0.001) and the risk of the cardiovascular composite endpoint (Log Rank (Mantel-Cox) 26.74 p < 0.001). Accord-

Results: GFR was estimated in 16167 analyses. GFR <60ml/min/1.73m² was present in 1254 analysis from 1094 patients (6.8% of total analysis), 70.7% women. These patients aged 40 to 98 years (mean 77±9). serum creatinine was 1.3±0.6 mg/dl and GFR 48.5±10 ml/min/1.73m². According to K/DOQI stages, 93% were at stage 3, 6.5% at 4 and 0.5% at 5. Glyceremia >126 mg/dl was found in 18.5% and >100 mg/dl in 10.4%. LDL-cholesterol levels >100 mg/dl was present in 54.6% and anemia (haemoglobin <13 g/dl in men or <12 g/dl in women) exist in 20.9% of patients with GFR <60ml/min/1.73m². 131 patients (12%) were nephrology referral during the study period or 3 months later. Referred patients versus non-referred patients characteristics are showed in Table 1.

Conclusions: In our primary care population, we found a prevalence of CKD near 7%, mostly women aged 70 to 80 years. Patients with GFR <60ml/min/1.73m² have a high prevalence of hypercholesterolemia and anaemia, and 18.5% were diabetics.

Only 12% of patients with CKD were nephrology referral. This patients were younger, present lower GFR with higher creatinine levels and worse control of LDL-cholesterol and anaemia than non-referred. So we thought GFR estimation improved nephrology referral.

FP161 SYSTEMATIC ESTIMATION OF GLOMERULAR FILTRATION RATE IN PRIMARY CARE PATIENTS AND ITS INFLUENCE IN NEPHROLOGY REFERRAL

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Introduction and Aims: Chronic kidney disease (CKD) is becoming a public health burden. The ageing population and the epidemic of type 2 diabetes are the main causes. Early detection of renal dysfunction is critical to its clinical management. Many factors affect serum creatinine concentration so creatinine-based equations are recommended to estimate glomerular filtration rate (GFR). The aim of this study was to know the number of CKD patients attended in primary care and the influence of systemic GFR estimation in nephrology referral.

Methods: This is a six months descriptive study. GFR was estimated using the modified MDRD formula in all primary care patients over 18 years living in the reference area of our Hospital, in who serum creatinine concentration were asking for their primary care doctor. Kidney function was classified by the K/DOQI stages. We also examined cholesterol and haemoglobin levels, as well as the presence of hyperglycaemia when were available.

Results: GFR was estimated in 16167 analyses. GFR <60ml/min/1.73m² was present in 1254 analysis from 1094 patients (6.8% of total analysis), 70.7% women. These patients aged 40 to 98 years (mean 77±9), serum creatinine was 1.3±0.6 mg/dl and GFR 48.5±10 ml/min/1.73m². According to K/DOQI stages, 93% were at stage 3, 6.5% at 4 and 0.5% at 5. Glyceremia >126 mg/dl was found in 18.5% and >100 mg/dl in 10.4%. LDL-cholesterol levels >100 mg/dl was present in 54.6% and anemia (haemoglobin <13 g/dl in men or <12 g/dl in women) exist in 20.9% of patients with GFR <60ml/min/1.73m². 131 patients (12%) were nephrology referral during the study period or 3 months later. Referred patients versus non-referred patients characteristics are showed in Table 1.
health problem. Although MS is known to be strongly associated with CKD in several cohort studies from different countries, it is not known which components of MS are more important than others for the development of CKD or which host factors play a significant part in the relationship between MS and CKD. To better understand the complex interrelationship between MS and CKD, we performed a cross-sectional study in non-institutionalized Korean civilians using the data of Korean NHANES in 2001. The Korean NHANES is a large survey of a nationally representative sample of the Korean population.

Methods: Of 7,918 participants, 5,491 at age between 20 and 79 years were available for analysis for the prevalence of CKD (defined as dipstick proteinuria or a reduced GFR less than 60 ml/min per 1.73 m² by MDRD formula). MS was diagnosed by NCEP-ATP III with the Asia-Pacific abdominal obesity criteria (90 cm for men, 80 cm for women). The prevalence of CKD increased with age, especially in 60 years and over sharply in both genders. Although MS was a significant determinant of CKD in entire subjects [OR=1.68 (95% CI 1.36-2.09), p=0.00], subanalysis revealed that it was only significant in younger men (<60 years) [OR=2.49 (1.50 to 4.12, p=0.000) in men<60, OR=1.04 (0.59 to 1.82, p=0.89) in men>60, OR=1.09 (0.69 to 1.72, p=0.73) in women<60, OR=1.44 (0.95 to 2.17, p<0.08) in women>60]. This finding suggested that MS was no more a significant determinant of CKD after age of 60 despite a high prevalence of MS per se in this age group. Among five risk factors of MS, all five components affected CKD in men (<60 years) [impaired fasting glucose: OR=3.08 (1.94 to 4.89, p=0.007), high TG: OR=2.69 (1.71 to 4.25, p=0.000), hypertension: OR=2.65 (1.70 to 4.11, p=0.000), central obesity: OR=2.41 (1.54 to 3.77, p<0.000), low HDL: OR=1.67 (1.08 to 2.58, p=0.02)] whereas only central obesity, hypertension and high TG related to CKD in women<60 years [central obesity: OR=1.60 (1.13 to 2.27, p=0.008), hypertension: OR=1.80 (1.22 to 2.76, p=0.003), high TG: OR=1.50 (1.02 to 2.20, p=0.04)].

Conclusions: Metabolic syndrome was a significant determinant of CKD in younger subject (<60 years), not in elderly population. In men, all five risk factors of MS were important, but in woman, only central obesity, hypertension and high TG were significant risk factors for CKD. In elderly population, not MS but aging and other risk factors may take more important part in the development of CKD.

UROTENSIN II IS AN INVERSE PREDICTOR OF DEATH FROM ALL CAUSES AND CARDIOVASCULAR EVENTS IN CHRONIC KIDNEY DISEASE STAGE 2-5

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Introduction and Aims: Urotensin (UT) is a cyclic vasoactive decapeptide highly represented in multiple organ systems, including the kidney and the cardiovascular (CV) system. Plasma levels of UT are much increased in end-stage renal disease (ESRD). However, despite its vasculotrophic potential in animal models, higher plasma UTN predicts longer survival in dialysis patients. We sought to determine if this same association exists in earlier stages of Chronic Kidney Disease (CKD) studying an incident cohort of 122 clinically stable pre-dialysis patients.

Methods: Linear models were used to study the associations of UTN with baseline characteristics, renal function, traditional and non-traditional CV risk factors including homocysteine and acute phase reactant proteins, and previous history of CV disease (coronary artery, peripheral or cerebrovascular disease, or heart failure). Cox’s regression was used to model time-to-death as a function of UTN considering the same covariates for adjustment plus a time-varying variable indicating progression to ESRD (progressed to ESRD vs. never/not yet progressed). Two separate models were built with either time-to-death from all causes or fatal CV events as outcomes.

Results: Mean age at enrolment was 71±11 years, 64% of patients were men, 24% diabetics and 58% had clinical CV disease. No correlation was found between baseline GFR (mean 32±15 ml/min/1.73 m²) and plasma UTN (mean ±3.6 ng/mL). In this cohort, plasma UTN (median 4.4 ng/mL, inter-quartile range: 2.0-7.4 ng/mL) was significantly higher (P<0.01) than that in healthy subjects (median 2.8 ng/mL, inter-quartile range: 1.9-4.6 ng/mL). In adjusted analysis UTN correlated directly with serum albumin (1.66 ng/mL per g/dL, P=0.004) and inversely with pre-existing coronary artery disease (-1.66 ng/mL, P=0.01). During a mean follow-up of 41 months, 43 patients died, 29 from CV events. After adjusting for potential confounding factors, increased UTN similarly predicted lower risk for death from all and CV causes (Hazard Ratio 0.88; 95% Confidence Intervals 0.80-0.97). Both models included C-Reactive-Protein, previous history of CV disease and the time-varying indicator of progression to ESRD as direct predictor of death. None of the other clinical characteristics, comorbid conditions, nontraditional and traditional CV risk factors considered were significant at the two-tailed level of 0.05 or modified the regression coefficient of UTN.

Conclusions: In patients with moderate to severe CKD plasma UTN is an inverse predictor of overall and CV mortality. Our findings confirm data observed in ESRD and suggest that UTN should not necessarily be viewed as a vasculotrophic peptide in CKD patients.

FP164 CLINICAL PREDICTORS OF ATHEROSCLEROTIC RENOVASCULAR DISEASE IN PATIENTS UNDERGOING CARDIAC CATHETERIZATION

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Introduction and Aims: The clinical diagnosis of atherosclerotic renal artery stenosis (RAS) remains problematic because its clinical manifestations are not specific. Fortuitous diagnosis of RAS has become commonplace. The aim of our study was clinical detection and severity determination of RAS in a high cardiovascular risk population, referred for diagnostic or therapeutic cardiac catheterization.

Methods: From April to December 2006, all consecutive patients (pts)
undergoing non-emergent cardiac catheterization at a single institution were also evaluated for atherosclerotic RAS by renal angiography. Clinical, laboratory, and angiographic data were recorded. Ps enrollment will end by April 2007.

Results: We studied 682 consecutive pts who underwent coronary angiography and renal arteriography (age 63±11 yr, M 494 P 188, sCr ±1.3 mg/dL, CrCl 87±31 ml/min, Diabetes 36%, Hypertension 87%, Hyperlipidemia 75%). In the aggregate, 49 patients out of 682 (7%) had a significant RAS (>30% stenosis) and 505/682 (74%) had at least 1 coronary vessel involved (1 vessel in 172 cases, 2 vessels in 168 cases and 3 vessels in 165 cases). On univariate logistic regression analysis, RAS was significantly associated to the severity of CAD [n of coronary vessel involved (P<0.001)], history of peripheral vascular disease (P<0.001), CrCl (P<0.001), serum creatinine (P<0.001), history of chronic renal insufficiency (P<0.001), hyperlipidemia (P=0.007), pulse pressure (P=0.008), age (P=0.01), systolic pressure (P=0.03), and BMI (P=0.05). No significant association was found between renal artery stenosis and sex, smoking and diabetes. In a multiple logistic regression model, including all univariate correlates of RAS, serum creatinine [odds ratio (OR) 1 mg/L increase: 6.95, 95% CI: 3.19-15.16, P<0.001], peripheral vascular disease (OR: 2.75, 95% CI: 1.38-5.49, P=0.004), hyperlipidemia (OR: 3.00, 95% CI: 1.03-8.77, P<0.04) and number of involved coronary vessels [OR 1 stenotic vessel increase: 1.39, 95% CI: 1.02-1.89, P=0.04] maintained an independent association with RAS. In a ROC curve analysis serum creatinine, peripheral vascular disease, hyperlipidemia and number of involved coronary vessels jointly produced a ROC curve area of 78.8% (95% CI: 72.2-85.4%, P<0.001). In this analysis, the contribution of the number of involved coronary vessels to identify RAS was very low (2.4%). Accordingly, the estimated probability of significant RAS, adjusted for the above mentioned significant covariates, associated with 0,1,2,3 CAD-vessels was 3%, 4%, 6% and 8%, respectively.

Conclusions: In a population at high risk for cardiovascular disease, not previously suspected of having RAS, the latter is associated with simple and readily determined clinical and laboratory characteristics. These data may facilitate the selection of patients who may have to undergo to diagnostic renal angiography procedures.

**FP156 MORTALITY RISK FOR PATIENTS RECEIVING HEMODIAFILTRATION VERSUS HEMODIALYSIS: RESULTS AT TWO YEARS FROM THE RISCAVID STUDY**

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**Introduction and Aims:** RISCAVID (Cardiovascular risk in dialysis) study is an observational and prospective study of the over 800 patients in hemodialysis and peritoneal dialysis of the north-west part of Tuscany. This population is rather peculiar because hemodialfiltration (HDF) is largely used for renal replacement therapy (44%). Characteristics and outcomes at two years were compared for patients receiving HDF versus HD.

**Methods:** The study followed 757 patients stratified into three groups: standard bicarbonate HD (n=424), and low- (n=205) and high-efficiency HDF (n=128). At the time of the enrolment demographic, clinical and laboratory data of the whole population were registered as well as co-morbidity conditions established by anamnestic and instrumental information. The population was followed up for 24 months reporting overall mortality, CV mortality and CV major non fatal events (acute myocardial infarction, stroke and iuctus). Cox proportional hazards regression assessed adjusted differences in mortality risk.

**Results:** Patients receiving standard HD had an higher incidence of diabetes (21.6% vs 16.4% low-eff. HDF vs 16.0% high-eff HDF); patients receiving low and high-eff HDF had significantly longer average duration of end stage renal disease (6.5 and 6.3 versus 5.5 years), patients receiving high-efficiency HDF had significantly more hypertension (60 versus 45% low-eff HDF). No significant differences were observed in received single-pool Kt/V (1.40 vs 1.43 vs 1.40). High-efficiency and low-HDF patients had lower crude mortality rates than standard HD patients. After adjustment, high-efficiency and low HDF patients had a significant lower mortality risk than the patients receiving standard HD (relative risk=0.78, P=0.01).

Conclusions: These observational results at two years from the RISCAVID study confirm recent findings that HDF may improve patient survival independently of its higher dialysis dose.

**FP166 IDENTIFYING INDIVIDUALS WITH CKD: ARE WE OVERESTIMATING THE NUMBER?**

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**Introduction and Aims:** Chronic kidney disease (CKD) is becoming increasingly common in the community as a result of our ageing population and rising incidence of diabetes. In recognition of this the Quality Outcomes Framework for CKD has been developed allowing us to identify “at risk” individuals at a much earlier stage and target management strategies. Despite this, little is known about the epidemiology and natural history of early CKD, particularly disease progression, and precisely what impact these individuals will have on the health service.

We aimed to establish with increased accuracy the prevalence and severity of CKD in a selected population with at least one abnormal creatinine in North-East Scotland.

**Methods:** In a linked study we identified 5751 patients with at least 1 creatinine ≥150umol/l (males) and ≥130umol/l (females) in a 6 month period using the single laboratory that serves Grampian (pop.500,000). Using the criteria of 3 abnormal creatinines, at least one month apart, revealed that 2315 had CKD. 474 had ARF and 88 ACRF using ADQI definition. 1918 patients, however, could not be classified. 1405 of these have been analysed to date. All available creatinines (median N=27) were converted to eGFR using the abbreviated MDRD formula. eGFRs were grouped into 3 time periods: Index, Previous and Future. Using median eGFR values patients were grouped according to their likelihood of having CKD. The breakdown of groups are as follows: Unlikely n=80 (5%), Uncertain=245 (17%), Probable n=933 (66%), insufficient data n=147(10%). The presence of markers of kidney damage, co-morbidities and outcomes were identified from case note review.

**Results:** The median age was 78 and 80 for males and females respectively. Median eGFR was 33.4 for females and 38.7 for males. Those in the “at risk” group were initially staged according to their index eGFR. Markers of kidney damage determined from case note review allowed a further 61 patients to be staged (994 in total). Of these, 82% are in Stage 3, 17.7% Stage 4 and 0.3% in Stage 5. Hypertension and ischaemic heart disease were the most common co-morbidities. Mortality in Stage 3 was 45% at 30-36 months. Median survival from time of index was 1.4 years for Stage 4 and 0.4 years for Stage 5. 131 patients in the “at risk” group without markers were classified as having no definite evidence of CKD (5% of 1405). The remaining 336 patients had insufficient data for classification (25% of 1405).

**Conclusions:** The majority of patients with at least one elevated creatinine (70%) in this study have evidence of CKD. This predominantly elderly population if referred to the renal services are likely to utilise a significant proportion of our health care resources. On the other hand a substantial minority (30%) have no conclusive evidence of CKD. These patients may have been included in other prevalence studies thus overestimating the prevalence of CKD.

**FP167 CLINICAL AND BIOCHEMICAL IMPLICATIONS OF LOW THYROID HORMONE LEVELS (TOTAL AND FREE FORMS) IN CKD STAGE 5 PATIENTS**


**Introduction and Aims:** Chronic kidney disease is a non thyroideal illness, and it has been recently suggested that low levels of free triiodothyronine (fT3) could be associated with pathological conditions and maladaptation leading to decreased survival rather than a sign of physiological adaptation
to energy shortage. In the present study, we explore and compare the association of decreased thyroid hormone levels (total and free forms) with inflammation, wasting and survival in patients with end-stage renal disease (ESRD).

Methods: This is a post hoc, cross-sectional study including 210 ESRD stage 5 patients close to the start of dialysis therapy, with a follow-up of up to 60 months. Biochemical measurements of total and free forms of thyroid hormones, s-albumin, hs-CRP, plasma interleukin (IL)-6, soluble vascular adhesion molecule-1 (sVCAM-1), insulin-like growth factor 1 (IGF-1) and 8-hydroxy-2'-deoxyguanosine (8-OHdG) were performed.

Results: Multivariate analysis according to receiver operating characteristic (ROC) curves, showed that among the hormones studied (total and free forms), mortality was best predicted by total triiodothyronine (T3). When using the cut-off levels derived from ROC, low T3 levels were associated with increased inflammation (higher concentration of hs-CRP, IL-6 and sVCAM-1), increased oxidative stress (higher concentration of 8-OHdG) and wasting (lower concentration of s-albumin and IGF-1). Finally, low T3 was associated with worse all-cause (Likelihood ratio= 35.9, p<0.0001) and cardiovascular mortality (Likelihood ratio= 37.6, p<0.0001) after adjustment for age, gender, presence of diabetes mellitus and inflammation.

Conclusions: This study shows that low thyroid hormone levels are associated to increased inflammation, wasting and oxidative stress markers in ESRD patients. This study is also able to compare and propose for the first time, T3 levels as a more sensitive prognostic factor than T3 of not only all-cause but also CVD mortality in ESRD patients. Altogether, the present study supports the hypothesis that thyroid dysfunction is implicated in the high mortality risk of the ESRD population. Supported by an ERA-EDTA grant.

FP169 MODERATE REDUCTION OF PRE OP GFR IS ASSOCIATED WITH POORER PROGNOSIS IN PATIENTS UNDERGOING GENERAL SURGERY

Adalbert Schiller1, Dora Valceanu2, Ana Maria Sararu2

Methods: We investigated 942 randomly assigned patients to this study (442 male, 500 female, average age 55.68±16.31 years) needing general surgery intervention. History for previous renal disease (renal function investigations) for hypertension (HT) and for diabetes mellitus (DM) was investigated. There have been followed up: blood pressure, hemoglobin, fasting blood glucose, urine output, serum creatinine, GFR (MDRD 4), criteria for sepsis and the survival of the patients. Data have been processed using the R Package statistical software. The t-test and the Fisher exact test were used for two-group comparisons and multiple regression analysis to evaluate influence of biological data on post op outcome.

Results: Patients have been divided into two groups: group 1- pre op GFR <60 ml/min/1.73m2, 24.73% of the cases (average GFR = 44.43±13.06 ml/min/1.73m2) and group 2- pre op GFR >60 ml/min/1.73m2, 75.27% of the cases (average GFR 93.71±33.74 ml/min/1.73m2). In group 1 patients presented significantly higher average age (65.48±11.36 vs. 52.47±16.41 years - p<0.0001) and higher prevalence of DM (52.36% vs. 30.18% - p<0.0001). Concerning the complications, the prevalence of sepsis and of ARF (according to RIFLE criteria) was significantly higher in the first group (9.87% vs. 2.96% - p<0.0001) and (30.04% vs. 3.94% - p<0.0001). 18.02% of the patients died in the post op period in group 1 as compared to 4.79% in group 2 (p<0.0001). The post op outcome was influenced by age of the patients the presence of ARF, of sepsis of high fasting blood sugar and low systolic blood pressure and not by the other clinical and biological data that have been followed up. There was an extremely strong dependency between ARF and low pre op GFR and we interpret these latter results as a direct consequence this fact.

Conclusions: Our analysis suggests that even moderate reduction of pre op GFR in patients undergoing general surgery is a risk factor for the development ARF and sepsis and a poor post op prognosis predictor.

FP170 INCIDENT END STAGE RENAL DISEASE (ESRD), MORTALITY AND PREDICTORS OF RENAL DEATH IN CKD PATIENTS REGULARLY FOLLOWED IN NEPHROLOGY: FOLLOW UP OF THE TARGET BLOOD PRESSURE LEVELS (TABLE) COHORT

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Cataldo Abaterusso5, Andrea Pota6, Alessio Montanaro7, Paolo Monardo8, Domenico Santoro8, Antonina Messina9, Vincenzo Bellizzi10, Giuseppe Conte1, for the TABLE Study Group. 1Div. of Nephrology, CNR in Reggio Calabria; 2University of Chieti; 3University of Verona; 4University Federico II in Naples; 5Hospital in Martina Franca; 6University of Messina; 7University of Catania; 8Hospital of Solofra, Italy

Introduction and Aims: The aim of this study was to evaluate the effects of decreased GFR on post op prognosis of patients undergoing general surgery interventions.

Methods: We investigated 942 randomly assigned patients to this study (442 male, 500 female, average age 55.68±16.31 years) needing general surgery intervention. History for previous renal disease (renal function investigations) for hypertension (HT) and for diabetes mellitus (DM) was investigated. There have been followed up: blood pressure, hemoglobin, fasting blood glucose, urine output, serum creatinine, GFR (MDRD 4), criteria for sepsis and the survival of the patients. Data have been processed using the R Package statistical software. The t-test and the Fisher exact test were used for two-group comparisons and multiple regression analysis to evaluate influence of biological data on post op outcome.

Results: Patients have been divided into two groups: group 1- pre op GFR <60 ml/min/1.73m2, 24.73% of the cases (average GFR = 44.43±13.06 ml/min/1.73m2) and group 2- pre op GFR >60 ml/min/1.73m2, 75.27% of the cases (average GFR 93.71±33.74 ml/min/1.73m2). In group 1 patients presented significantly higher average age (65.48±11.36 vs. 52.47±16.41 years - p<0.0001) and higher prevalence of DM (52.36% vs. 30.18% - p<0.0001). Concerning the complications, the prevalence of sepsis and of ARF (according to RIFLE criteria) was significantly higher in the first group (9.87% vs. 2.96% - p<0.0001) and (30.04% vs. 3.94% - p<0.0001). 18.02% of the patients died in the post op period in group 1 as compared to 4.79% in group 2 (p<0.0001). The post op outcome was influenced by age of the patients the presence of ARF, of sepsis of high fasting blood sugar and low systolic blood pressure and not by the other clinical and biological data that have been followed up. There was an extremely strong dependency between ARF and low pre op GFR and we interpret these latter results as a direct consequence this fact.

Conclusions: Our analysis suggests that even moderate reduction of pre op GFR in patients undergoing general surgery is a risk factor for the development ARF and sepsis and a poor post op prognosis predictor.
selected from general population, incidence of death is 2 to 50 times greater than that of ESRD and associated with CKD severity. Whether the same holds true in tertiary nephrology care is unknown. We evaluated outcome and determinants of renal death in the Italian TABELLE cohort of CKD patients.

Methods: Large prospective cohort was constituted enrolling all consecutive patients attending 26 renal clinics during a 6-month period of 2002/03 that had diagnosis of CKD, GFR ≤60 mL/min/1.73㎡ (no dialysis-no transplant) and Nephrology care from ≥6 months. Follow up for renal death (all-cause death, ESRD) ended at 11/30/06. Survival analysis was performed by means of incidence rates and Cox regression model.

Results: Out of 1353 patients screened, 1269 met selection criteria (stage 3, 4, 5; 596, 504, 169). At baseline age was 66±14 y, males 57%, diabetics 28%, cardiovascular (CV) disease 31%, GFR 30.4±13.8 mL/min/1.73㎡, systolic blood pressure (SBP) 139±18 mmHg, total cholesterol (TC) 199±42 mg/dL, haemoglobin (Hb) 12.5±1.8 g/dL, proteinuria 1.03±1.43 g/day. C1 or ARB were prescribed in 72% of patients, statin in 21% and epoetin in 13%. During a median follow up of 30 months, 258 patients reached ESRD while 150 died (72% for CV cause) with incidence rates of 8.8 versus 5.1/100 pts/yr (Figure). Cox model (hazard ratio and 95% confidence interval) showed that age (1.02, 1.01-1.02, P<0.001), diabetes (1.26, 1.00-1.60, P=0.049), CV disease (1.57, 1.24-1.97, P<0.0001), and proteinuria (1.14, 1.08-1.21, P<0.0001) predicted renal death, while a protective role was found for GFR (0.93, 0.92-0.94, P<0.0001), Hb (0.92, 0.85-0.98, P=0.015) and statin prescription (0.64, 0.47-0.87, P=0.004). Gender, SBP, TC, and use of CEI/ARB were not significant.

Conclusions: In CKD patients followed in Italian renal clinics, mortality is less frequent than ESRD and does not increase with worsening of CKD. Discrepancy with previous studies may be due to the tertiary care setting and the lower background Italian population CV mortality. Under these conditions, renal survival can be improved by larger use of statins and more intensive treatment of proteinuria and anemia.

FP171 ASSOCIATION OF METABOLIC SYNDROME AND CHRONIC KIDNEY DISEASE (CKD) IN KOREA: RESULTS FROM KOREAN NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (KOREAN NHANES)


Introduction and Aims: CKD is now a worldwide epidemic, which is possibly due to the continuous increase in the prevalence of MS. MS has been shown to be strongly associated with CKD in several cohort studies from different countries. Incidence of end stage renal disease (ESRD) in Korea is increasing more than 10% annually, which takes the 11th rank in the world according to USRDS in 2006. Early detection and treatment of the risk factors for CKD have a paramount importance to reduce the incidence of ESRD. To better understand the clinical implication of MS as a risk factor of CKD and its characteristics which is possibly different in each countries with different ethnic background and life style, we performed a cross-sectional study in non-institutionalized Korean civilian using the data of Korean NHANES in 2001.

Methods: Of 7,918 participants, 5,491 at age between 20 and 79 years were available for analysis for the prevalence of CKD (defined as dipstick proteinuria or a reduced GFR less than 60 ml/min per 1.73㎡ by MDRD formula). MS was diagnosed by original NCEP-ATP III criteria (waist circumference, 102 cm for men and 88 cm for women, NCEP-O) or NCEP-ATP III with the Asia-Pacific abdominal obesity criteria (90 cm for men, 80 cm for women, NCEP-AP).

Results: Overall, 33.9%, 16.2%, 33.1%, 40.9%, 9.9% and 33.6% of the participants had elevated blood pressure, high plasma glucose, high triglyceride, low HDL-cholesterol and abdominal obesity by NCEP-O and NCEP-AP, respectively. The prevalence of MS was 18.0% by NCEP-O and 25.7% by NCEP-AP. CKD was seen in 8.7% of subjects. In subjects with MS, the prevalence of CKD was higher (18.3 vs. 6.7%, P<0.0001) with a lower GFR (74±20 vs. 80±1.1 ml/min/1.73㎡, P<0.0001) compared to subjects without MS. There was a significant graded increase in the prevalence of CKD with number of components of MS. The multivariate-adjusted odds ratio of CKD in subjects with MS compared with subjects without MS was 1.50 (95% CI, 1.19 to 1.90, P<0.0001). Compared with subjects with 0 or 1 components, subjects with 5 components of MS had multivariate-adjusted odds ratio of 6.58 (CL 4.07 to 7.74, P<0.001).

Conclusions: Metabolic syndrome is a significant determinant of CKD in Korean general population. Prevalence of low HDL-cholesterol was higher compared to studies from the US and Japan with a variable prevalence of CKD.

FP172 CLINICOPATHOLOGIC STUDY FOR ASYMPTOMATIC URINARY ABNORMALITIES

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Introduction and Aims: Since 1998, by law, all school children in Korea must have an annual urinalysis. The first early morning urine specimen is examined by a simple dipstick method for the detection of proteinuria, hematuria and sugar. If a urine test is positive, a second test is performed by pediatric nephrologists. We analyzed the results of clinical data and the renal biopsy findings of patients detected by school urinalysis screening from 1998 to 2005.

Methods: We analyzed urinalysis data of 2,100 children referred for urinary abnormalities by school urinalysis screening. We also investigated histopathologic findings and diagnosis of 1,300 asymptomatic persistent and/or proteinuria patients who took renal biopsy.

Results: The male to female ratio was 1.4:1 and the mean age 9.8 years. The chief complaints for renal biopsy were 578 cases (45.3%) of isolated hematuria, 109 cases (8.5%) of isolated proteinuria and 479 cases (37.5%) of hematuria combined with proteinuria. In the histopathological findings, primary glomerular disease was 75.8% which was IgA nephropathy in 30.3%, mesangial proliferative glomerulonephritis in 27.2%. Systemic disease was 11.4% which was Henoch-Schonlein nephritis in 10.4%, and lupus nephritis in 0.8%. Alport syndrome showed 1.2% as a hereditary disease.

Conclusions: Early detection through school urinalysis screening and confirm diagnosis by renal biopsy seem to be helpful for assessment of prognosis and intervention of disease progression.
these to an enriched General Practice dataset produced a cohort of 75,434 subjects containing 307,663 results. To capture progression over the two-year period, a three-point assessment was devised. Progression and periods of regression were characterised by the gradients ΔA and ΔB. A cut-off level (eGFR 60mls/min) was additionally used to categorise the change in the patient’s eGFR. Progression was also categorised as stable (<1mls/min/yr), slow (1-5mls/min/yr) and rapid (>5mls/min/yr).

Results: 56,356 (74.7%) subjects had “all eGFR results” >60 mls/min throughout the entire period. 11,249 (14.9%) had “all eGFR results” <60 mls/min and 5017 (6.7%) had a minimum eGFR measured below 60mls/min and yet subsequently had a value measured above 60mls/min. In total, 1,167 were known to Nephrology services. Of these, 341 (29.2%) had an eGFR>60mls/min over the two year period. Importantly 2,699 (3.6%) subjects unknown to nephrology demonstrated a rapid decline from stages 1 or 2 CKD to stage 3 or worse.

Conclusions: Progression of CKD is often taught to be linear; this data indicates that alternative patterns of progression occur in the natural history of CKD, including improvement in function. Significant numbers of subjects attending Nephrology services have no evidence of progressive decline in eGFR whilst the vast majority with CKD remain unseen. Although some of these patients may have important reasons for attending Nephrology services, this may be to the detriment of those with more progressive CKD.

Introduction and Aims: The reported incidence and sequelae of Hepatitis C varies significantly internationally and extra-hepatic manifestations of the disease are common. However, despite the well recognised association between hepatitis C and glomerulonephritis, the prevalence of renal disease in this population has not been studied. The purpose of this prospective study was to determine the prevalence of and risk factors for renal disease in a Northern European population attending a specialist Hepatitis C clinic.

Methods: All patients attending the specialist hepatitis C clinic during a 3 month period provided urine and blood samples for renal and liver function, cryoglobulins, complement, anti-nuclear factor, rheumatoid factor and 25-OHD. Renal disease was defined by the presence of significant proteinuria (>300mg/24hrs), abnormal urinalysis (x3) and/or a raised serum creatinine (>110mmol/l).

Results: 72 patients (41 male) were included in the study. 59 were HCV PCR positive and 13 were currently PCR negative. 46 patients had a history of intravenous drug use, 18 had received infected anti-D immunoglobulin and 8 were sporadic cases. Mean age was 40.9±10.9 years. 65% of patients were genotype 1 and 35% were genotype 3. Mean duration of infection was 13.1±9.5 years. 33% were ANF positive and 47% were RF positive. None of the patients had a history of diabetes mellitus or hypertension.

8 patients (11%) had evidence of renal disease. 7 patients had proteinuria and 1 had an abnormal urinalysis. All 8 patients were PCR positive. There was no difference in age, gender, duration of infection or aetiology between those with and without renal disease. There was a trend towards increased inflammation and fibrosis in the liver biopsies of those with renal disease. Patients with renal disease were more likely to have cryoglobulinaemia (63% v 22%, p=0.01). Serum creatinine was within the normal range in all but one patient.

Cryoglobulins were present in 27%. None of the PCR negative participants had cryoglobulinaemia. There was also no difference in age, gender, duration of infection or aetiology between those with and without cryoglobulins. Cryoglobulinaemic patients were significantly more likely to be rheumatoid factor positive (76 v 35%, p=0.008), had higher ALT levels (53 v 50, p=0.02), lower C4 (0.21 v 0.24, p=0.05) and higher IgG levels (16.5 v 13.7, p=0.003).

Conclusions: As far as we are aware, this is the first prospective study to examine the incidence of renal disease in a population of patients with hepatitis C. Overall, 11% of the patients in this study had evidence of renal disease and 27% had cryoglobulinaemia. This represents a higher prevalence of renal disease in those with hepatitis C than in the general population. We suggest that all patients with hepatitis C, particularly those with cryoglobulinaemia, should be screened for renal disease as early recognition may allow appropriate treatment and possibly reduce future complications. Further studies are required to confirm these findings.
Introduction and Aims: The aim of this study was to establish clinical and laboratory characteristics of the population living in the Croatian region of endemic nephropathy (EN).

Methods: This study included 738 individuals from EN villages (307 male (M), 431 female (F)), and 120 subjects from a control village (K) (50 M, 70 F). No differences in the distribution of gender and age were observed between EN and K (p<0.01). Following administration of a detailed questionnaire and clinical examination, investigators obtained blood and urine samples from the subjects. The population was classified according to WHO criteria as diseased (D), suspect (S), at risk (R) and others (O).

The following definitions were used: microalbuminuria (MA) > 30 mg/l; alpha-1-microalbuminuria (alpha-1) > 20 mg/l, hypertension, BP > 140/90 mmHg and/or antihypertensive drug therapy; and anemia (AN) as Hb < 120 g/l in M and <113 g/l in F. Renal disease (RD) was classified according to NKF classification.

Results: The frequency of the WHO categories in this group was: D=1.4% (M, 1.73% vs. F, 1.34%, respectively), S=5.6% (M, 7.79% vs. F, 4.83%). If we analyze only the portion of population who resided > 20 years in an EN village, then the incidence of D is 1.8% and of S is 6.8%. In the subgroup of persons living in EN villages < 10 years, there was none in the D group and only 2% were in the S category. In the EN villages, we found an increased MA frequency compared with K (20.0% vs. 9.8% M, respectively; 16.6% vs. 9.37% F, respectively), as well as an increased frequency of alpha-1 (21.73% vs. 13.72% M, respectively; F 9.48% vs. 4.54%, respectively). No similar differences were observed between subgroup O and K. The prevalence of hypertension was slightly lower in EN villages than in K (51.75% vs. 58.9%; M 54.07% vs. 57.1%; F 51.97% vs. 58.46%, respectively). There were no differences in the frequency of RD stages > 2 (by NKF classifications) or in anemia between EN and K. The duration of residence in EN villages was significantly correlated to MA, alpha-1 and serum creatinine, but was not significant for those living < 20 years in an EN area and in residents. A significant correlation was observed between years living in an EN area and the presence of MA, alpha-1 and serum creatinine even in persons in WHO categories R and O.

Conclusions: The incidence of D and S in this group has remained the same as before. The duration of residence in the endemic area affects EN prevalence. The two village populations differed in MA, alpha-1, and hypertension frequency but not in anemia and renal disease stage > 2. The known significant association between early renal impairment in persons classified as R and O living in EN villages, indicates that new diagnoses of S and D will be registered in the next several years regardless of whether the causative agent is still present or active.
FP180 CAN A PHYSIOTHERAPY-LED OUTPATIENT RENAL REHABILITATION PROGRAMME ACHIEVE SIGNIFICANT IMPROVEMENTS IN EXERCISE CAPACITY, FUNCTIONAL ABILITY AND QUALITY OF LIFE IN PATIENTS WITH CHRONIC KIDNEY DISEASE (CKD)

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Introduction and Aims: The majority of patients can exercise during all stages of chronic kidney disease (CKD) but exercise is still not routinely advocated in renal disease compared with best practice in other diseases such as cardiac and pulmonary disease. The first U.K physiotherapy-led Renal Rehabilitation Programme, comprising of 12 weeks of twice-weekly supervised exercise and education sessions, and once-weekly specific home exercises, was initiated to determine whether patients with CKD could achieve significant improvements in exercise capacity and functional ability.

Methods: 30 patients (13M,17F) have completed 12 weeks in the programme and have been monitored for exercise performance tests at baseline and 12 weeks. Exercise performance tests included the Incremental Shuttle Walk Test (ISWT), sit to stand 60 (STS60), timed up and go 3m (TUG3m), stair climbing/descent (SDC), Duke’s activity status index (DASI) and the Hospital Anxiety Depression assessment (HAD).

Results: Student’s paired t-test analyses were performed to assess differences between baseline and 12 week data. ISWT improved by 54% (t < 0.001), STS60 by 40% (t < 0.001), TUG3m by 28% (t < 0.001), SDC by 33% (t < 0.001), DASI by 67% (t < 0.001), HAD anxiety score by 27% (t < 0.001) and HAD depression score by 11% (t < 0.001) after 12 weeks.

Conclusions: Increased fitness and muscle strength makes exercises of daily living easier as is demonstrated by the significant improvements in the DASI score, and enables some people to increase return to activities that they enjoy such as walking or playing sport. Preliminary experience from this renal rehabilitation programme combining 12 weeks of exercise and education suggests that significant improvements in exercise capacity and physical functioning can be achieved in CKD patients with a supervised outpatient exercise programme.

FP181 SHORT TERM SURVIVAL IN CHRONIC KIDNEY DISEASE PATIENTS WITH STROKE

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Introduction and Aims: Chronic kidney disease (CKD) occurs commonly in patients with vascular disease. In addition, CKD is a risk factor for the development and progression of vascular disease. Recent studies have confirmed that even early CKD constitutes a significant risk factor for non-fatal cardiovascular events and death. Our aim was to investigate in a large series of consecutive patients hospitalized for stroke the prevalence of CKD and second to assess determinants short-term survival, in this high risk population with associated cardiovascular disease and CKD.

Methods: Study population: 1090 consecutive subjects (mean age was 66.6±11.5 years, 40.3% males) admitted for confirmed (by CT scan) ischemic or hemorrhagic stroke. Collected data: associated comorbidities, cause of CKD, biochemical parameters at admission including serum creatinine, development of acute renal failure during hospitalization (as defined by RIFLE criteria) and 30 days survival.

Results: The demographic characteristics of the study group are presented in Table 1. The deceased patients were older, had higher serum creatinine at admission and higher serum glucose (p < 0.05). The mean survival in CKD stage 4 and 5 patients was 16±2 days, significantly worse than for other CKD stages (log rank test = 0.0001). Cox Regression model show age (RR = 1.037, 95% CI: 1.021-1.054), serum glucose (RR = 1.005, 95% CI: 1.002-1.007), CKD stage4 and 5 (RR = 2.563, 95% CI = 1.489-4.409), presence of chronic heart failure (RR = 0.418, 95% CI = 0.3-0.583), type of stroke (RR = 2.59, 95% CI = 1.87-3.67) and development of acute renal failure (RR = 0.326, 95% CI = 0.22-0.483) to be the predictors of 30 day survival.

Conclusions: A chronically impaired renal function is frequently encountered in patients admitted with stroke and has severe impact on short-term mortality and morbidity.

FP182 CHRONIC KIDNEY DISEASE MINERAL AND BONE DISORDER (MBD) MANAGEMENT IN CKD STAGE 3-4. MERENA STUDY

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Introduction and Aims: K/DOQI® Guidelines defines the treatment and the targets for CKD mineral and bone disorder (MBD) management at every CKD stage. A lot of information concerning BMD on dialysis patients is now available but very little is known about CKD stages 3 and 4.

AIM: To describe the Guidelines adherence and clinical management of BMD in Nephrology Outpatient Clinic (NOC) all over the country.

Methods: MERENA is an observational prospective, multicentre study to describe the global clinical management and three years outcome of CKD patients in stage 3-4. Nephrologist collected data in a web-based electronic CRF. We analyse here the basic data of the cohort related to BMD-CKD treatment and the targets obtained.

Results: (marked as *p < 0.001; +p < 0.01). 1115 patients from 50 NOCs were included (CCr<31±10 ml/min, aged: 67±13 y.). We classify patients in CKD3 and CKD4 using C-G formula and found 49% CKD 3 and 51% CKD 4 (CCr 23±1±4,2 vs 40±1±7,9 ml/min*). CKD 4 patients presented with higher serum phosphorus (P) (4,0±0,8 vs 3,5±0,6 mg/dl*), Ca×P product (37,2±7,7 vs33,4±6,1 mg²/dl*²) and intact-PTH (173,6±134 vs 125,4±95,6 mg/ml*) than CKD 3 ones. In spite of a higher use of phosphate binders (29,3 vs 11,3%*) and vitamin D (19,8 vs 10,3%*), CKD 4 patients showed lower target achievement: i-PTH > 300 pg/ml (12,9 vs 4,2%), hyperP (>15,4 vs 4,2%) and Ca×P product > 55 (2,8 vs 0,4%*). Only 17,2% of CKD 4 patients and 23% of CKD 3 achieve all the K/DOQI- BMD targets. The relative risk of i-PTH >300 mg/ml was 3,29 I [1,76-6,15] in CKD 4 vs CKD 3 adjusted by age and treatment. We found no differences between DM and Non-DM patients.

A majority (68%) of CKD-4 patients with i-PTH >150 mg/ml did not receive vitamin D (without a contraindication due to Ca or P levels) and 55% of patients that should be under chelant treatment did not receive it. 70% of biochemical parameters with an i-PTH of 131 pg/ml (31,4% > 150 mg/ml) and a serum P up to 6,7, didn't receive phosphate binders nor vit D in spite of 43 months under nephrologist care, but 93% of them received antihypertensive agents and 20% erythropoietic agents.

Conclusions: We present now large-scale data concerning BMD management on CKD 3 and 4. Nephrologists seem to undertreat BMD with poor Guidelines adherence and results.
THE EVALUATION OF EFFECTS OF L-CARNITINE SUPPLEMENTATION ON PREVENTION OF MUSCULAR SYMPTOMS IN PATIENTS UNDER CHRONIC HEMODIALYSIS

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Introduction and Aims: L-carnitine plays an important role in oxidation of fatty acids. It is essential in tissues that preferentially use fatty acids for their energy needs, especially skeletal muscle and myocardium. It is lost from plasma during hemodialysis and is lower in skeletal muscle of end-stage renal disease (ESRD) patients undergoing chronic hemodialysis. The aim of study was to evaluate effects of L-carnitine supplementation on prevention of muscular symptoms in patients under chronic hemodialysis.

Methods: In a double-blind clinical trial, sixty ESRD patients were assigned to two groups: Group A consisted of 30 patients who received 500 mg oral L-carnitine everyday for 8 weeks, and group B received a placebo. At 2, 4, and 8 weeks after the initiation of treatment, subjects were asked about muscle symptoms (weakness, fatigue, cramps/aches).

Results: 93.2% of subjects of group A had at least some improvement in muscular symptoms. Five patients (16.6%) reported mild progress, and 12 (40%) reported marked improvement. Whereas, only nine subjects (30%) reported some mild improved muscular symptoms and the rest (70%) did not report any improvement. (p<0.05).

Conclusions: Low-dose L-carnitine supplementation in hemodialysis patients improves muscular symptoms and their sense of wellbeing by restoring carnitine tissue levels and washing out cumulative acyl moieties.

BONE MARROW IRON STORES AND IV IRON SUPPLEMENTATION IN ANEMIA OF NON-DIALYZED CKD PATIENTS

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Introduction and Aims: Iron deficiency is common in anemic CKD non-dialyzed patients. By it’s correction only, about 1/3 of patients reached the hemoglobin (Hb) target. Peripheral markers of iron deficiency are not validated yet and central markers (eg bone marrow iron stores) are seldom reported.

This study aims to evaluate the relation among the bone marrow iron stores, peripheral markers of iron deficiency and therapeutic effect of IV iron sucrose in anemic CKD non-dialyzed patients.

Methods: 70 anemic (Hb<10.5g/dL) CKD patients EPO and iron-naive were enrolled [55% men; median age 60 (24-84yrs)]. The main primary renal diseases were vascular and glomerular nephropathies (43% and 28%, respectively). Hemoglobin was <10g/dL in 63% of the population.

Results: Mean Hb significantly increased after iron therapy irrespective of iron status were reassessed.

Conclusions: Although iron stores, ferritin level and TS seem to be useful indicators of absolute iron deficiency, predicting the increase in Hb after correction, the therapeutic trial of iron supplementation is worthy in anemic pre-dialysis CKD patients as even those with repleted iron stores could respond to IV iron.

A PROSPECTIVE COHORT STUDY OF SURVIVAL IN INCIDENT ADULTS WITH END STAGE KIDNEY DISEASE, RESIDENT IN SOUTH WEST IRELAND

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Introduction and Aims: In the Republic of Ireland there is currently no registry of end stage kidney disease (ESKD). This study prospectively follows the cohort resident in counties Cork and Kerry (population 580,356) commencing renal replacement therapy (RRT) from 01.01.2002 to 31.12.2005. Survival and the factors that predict survival were modelled. UK Renal Registry data were used for comparison.

Methods: 197 adult subjects commenced RRT. Covariates include: age at start RRT ESKD aetiology, mode of RRT, initial type of dialysis access and nephrology review for at least 3 months prior to RRT. Co-morbidity was measured by Davies index. Serum albumin at commencement of RRT was recorded. Survival time was from commencement of RRT to 1.00.2006 or death, without censure at transplant. Cox regression was used to model potential factors influencing survival and to derive crude and adjusted hazard ratios (HR). Bidirectional stepwise model regression excluded covariates no longer associated with survival. Crude mortality rate was calculated. 1 year survival was compared to the UK Renal Registry Report 2004.

Results: The crude mortality rate was 16.2 deaths per 100 person-years (95% CI 12.5, 21.0). 57 subjects died. Median follow up was 1.6 years (IQR 0.7, 2.8). Survival was 87.4% at 1 year. Cox model was used to model potential factors influencing survival and to derive crude and adjusted hazard ratios (HR). Bidirectional stepwise model regression excluded covariates no longer associated with survival. Crude mortality rate was calculated. 1 year survival was compared to the UK Renal Registry Report 2004.

Univariate & multivariate HR for death

<table>
<thead>
<tr>
<th>n=196</th>
<th>Unadjusted HR (95% CI)</th>
<th>p value</th>
<th>Adjusted HR (95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Davies Index 0</td>
<td>1.0</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2</td>
<td>12.2 (4.3,34.6)</td>
<td>&lt;0.001</td>
<td>6.7 (3.2,26.2)</td>
<td>0.001</td>
</tr>
<tr>
<td>3-5</td>
<td>25.8 (8.7,76.3)</td>
<td>&lt;0.001</td>
<td>9.1 (2.9,28.3)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Nephrology Review</td>
<td>0.28 (0.17,0.48)</td>
<td>&lt;0.001</td>
<td>0.47 (0.25,0.9)</td>
<td>0.02</td>
</tr>
<tr>
<td>Elective Access</td>
<td>1.0</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tunnelled Catheter</td>
<td>5.1 (2.3,11.4)</td>
<td>&lt;0.001</td>
<td>2.53 (1.1,5.9)</td>
<td>0.01</td>
</tr>
<tr>
<td>Temporary Catheter</td>
<td>10.4 (4.1,26.1)</td>
<td>&lt;0.001</td>
<td>3.49 (1.2,10.1)</td>
<td>0.02</td>
</tr>
<tr>
<td>Transplant list</td>
<td>0.04 (0.01,0.18)</td>
<td>&lt;0.001</td>
<td>0.19 (0.03,0.9)</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Unadjusted 1 year survival by age

<table>
<thead>
<tr>
<th>Age</th>
<th>KM survival (%)</th>
<th>KM 95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW Ireland</td>
<td>18-64</td>
<td>87.2%</td>
</tr>
<tr>
<td></td>
<td>&gt;65</td>
<td>66.9%</td>
</tr>
<tr>
<td>n=119</td>
<td>All ages</td>
<td>74.8-86.0</td>
</tr>
<tr>
<td>UK Registry</td>
<td>18-64</td>
<td>88.9%</td>
</tr>
<tr>
<td></td>
<td>&gt;65</td>
<td>64.9-69.2</td>
</tr>
<tr>
<td>n=11</td>
<td>All ages</td>
<td>76.3-79.0</td>
</tr>
</tbody>
</table>

Neither renal function nor inflammation did influence the relation among central and peripheral markers of iron deficiency or the treatment outcome.
Atherosclerotic renovascular disease (ARVD) acts as an independent predictor of poor glomerular filtration rate in the geriatric population

FP187

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Introduction and Aims: Uric acid has been considered as a non-traditional risk factor of cardiovascular disease (CVD). Chronic kidney disease (CKD) patients have a high risk of CVD-related morbidity and mortality. Epidemiological evidences for the significance of hyperuricemia on the risk for kidney dysfunction is scarce, especially in the geriatric population. We hope to identify the possible relationship between hyperuricemia and renal function in the elder population.

Methods: All patients were older than 65 years visiting National Taiwan University Hospital for elderly health examination during Jan. and Dec. 2003. We applied the Modification of Diet in Renal Disease (MDRD) equation 7 to estimate glomerular filtration rates (GFRs). Sex, age, body height, and body weight were recorded. All biochemistry data were measured in a single clinical laboratory. Linear regression model was applied to find factors that are independently associated with GFRs. Receiver operating characteristic (ROC) curve identify the cut-off values to predict advanced CKD (stage III to V).

Results: The study enrolled 491 men and 309 women with mean age (74.5±5.2), mean uric acid (6.2±1.5 mg/dL) and GFRs (87.8±18.5 ml/min/1.73m²), Age, serum uric acid, creatinine and BUN are negatively associated with MDRD-GFRs, but serum albumin and hemoglobin are associated positively. Stepwise regression identifies seven factors as an independent predictor for MDRD-GFRs (Table 1). Hyperuricemia acts an independent predictor for GFRs after adjusting conventional factors influence renal function. ROC curves identify uric acid greater than 6.75 mg/dL in male, and 5.95 mg/dL in women were the cut-off value to predict advanced CKD in the geriatric population (Figure 1).
**FP188** CHOICE OF INITIAL MODALITY OF CHRONIC DIALYSIS TREATMENT AND EFFECT ON SURVIVAL

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**Introduction and Aims:** Several studies investigated the factors related to the chronic dialysis (CD) modality choice and the outcomes of patients starting with hemodialysis (HD), hemodiafiltration (HDF) and peritoneal dialysis (DP). However, few studies were performed using data derived from an area-based registry. The aim of the study is to evaluate the factors influencing the CD modality choice and the effect of first type of dialysis on patients’ survival.

**Methods:** Prospective cohort study of 8122 undergoing chronic dialysis patients notified to Lazio Dialysis Registry (Italy) from 1-1-1995 to 31-12-2005. We performed a multimodal logistic regression to estimate determinants of initial modality of CD, and a multiple Cox model to estimate mortality hazard ratios (HR).

**Results:** We observed 90.4% HD, 2.2% HDF, 7.3% DP as first dialysis modality; an older mean age in HD patients (64.2, SD 15.8), compared to HDF (55.6, SD 17.4) and DP (58.5, SD 18.6). A higher probability of initiation with HD compared both HDF and DP was found for: age >64 years (OR 3.50, 95%CI 2.40-5.11and OR 1.52; 95%CI 1.25-1.85), cancer (OR 2.59; 95%CI 0.94-7.13 and OR 1.88; 95%CI 1.17-3.04). A higher probability of initiation with HD compared to DP was found for: vasculopathy (OR 1.40; 95%CI 1.04-1.88) and compared to HDF for women (OR 1.68; 95%CI 1.17-2.43). A higher probability of initiation with HDF compared to HD was found for coronary heart disease (OR 1.54; 95%CI 1.02-2.33) and congestive heart failure (OR 1.71; 95%CI 1.03-2.84) and compared to DP for HCV positive subjects (OR 2.16; 95%CI 1.14-4.09). A higher probability of initiation with DP compared both HD and HDF was found for patients with self-sufficiency (OR 2.12; 95%CI 1.67-2.69 and OR 2.09; 95%CI 1.33-3.29). A higher probability of initiation with DP compared to HD was found for coronary heart disease (OR 1.36; 95%CI 1.06-1.73) and hypertension (OR 1.47; 95%CI 1.22-1.76) and compared to HDF for women (OR 1.85; 95%CI 1.24-2.77) and age >64 years (OR 2.30; 95%CI 1.52-3.49). No difference in survival was found between patients starting with HD or HDF (HR 1.04; 95%CI 0.78-1.38) and DP (HR 1.10; 95%CI 0.94-1.29).

**Conclusions:** Our findings seems to suggest that evaluation of clinical condition and patient’s autonomy are determinants of choice of initial modality of CD treatment. However, as we confirm no association between long-term survival and first dialysis modality, the preference of the patients should have more relevance in the choice of first type of CD treatment.

**FP189** DOES AREA SOCIOECONOMIC STATUS (SES) PREDICT INCIDENCE AND RATE OF PROGRESSION OF CHRONIC KIDNEY DISEASE (CKD): A PILOT STUDY BASED ON A CLINIC POPULATION

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**Introduction and Aims:** Low socioeconomic status is associated with several chronic diseases, but evidence relating to CKD is scant. A few studies suggest that SES is an independent risk factor of progression of CKD and clinical outcomes. This pilot study attempts to explore the association of SES levels attributed to a geographical area (super output area) and CKD.

**Methods:** A study population of 458 diagnosed CKD patients was collected as a systematic sample (1 in 8 cases) from the total number of CKD patients being followed-up in the Sheffield Kidney Institute. Area level SES was classified using the Index of Multiple Deprivation 2004 (IMD 2004) which includes measures of income, employment, health and disability, education, skills and training, barriers to housing and services, living environment and crime. We also analysed the data from a subgroup of 104 patients with CKD (1 in 4 cases of 458 total populations) at baseline clinical and biochemical presentation of CKD and its progression rate.

**Results:** Demographic characteristics. Of this sample, 59% lived in the most deprived areas (fifth quintile by IMD), in whom 87% were white compared to 13% non-white (8% Asians, 2% Caribbean, 3% Somalis). There was a higher number of males with CKD (61%). Overall 16% of patients were aged over 80 years, 48% aged 61-80, 12% aged 41-60 and 23% aged 20-40. The distribution across deprivation quintiles was similar for all age groups, except for the 40-60 age group who were slightly more likely to be living in the most deprived areas. 37% of CKD patients were retired, 15% were unemployed or housewife, 10% were unskilled workers, 9% were professional or skilled worker, and 2% students.

**Clinical and bio-chemical characteristics.** Based on the subgroup with clinical data, the aetiology of CKD differed by age group. For patients over 40 years, commonest causes are type 2 diabetes, hypertension (HTN), possible analgesic nephropathy and for patients age between 20-40 years, most common causes are glomerulonephritis, vasculitis and HTN.

Overall, incidence of CKD by area-level SES, are 4 new cases per 1000 population for the most deprived areas (fifth quintile by IMD), and 3 per 1000 for the less deprived areas (third and fourth quintile by IMD) (p=0.03). Rate of progression was related to area deprivation, with progression more likely in patients from the most deprived area (73%) than overall (46%) (p=0.01).

**Conclusions:** Incidence and rates of progression were higher for patients from the more deprived areas. Further work is required to explore the individual level and area level explanations for these associations.
Introduction and Aims: A recent Cochrane review of eight clinical trials including patients with moderate to severe chronic renal failure concluded that a reduced protein diet has the potential of delaying the need to start treatment with dialysis. The objective of this analysis was to evaluate the cost-effectiveness (cost per QALY gained) of low protein diet supplemented with essential amino acids compared with normal diet in patients with moderate to severe renal failure.

Methods: A Markov model was designed to evaluate renal failure progression for patients on either low protein or normal diet. The model was based on monthly probabilities to progress between three discrete health states: “pre-dialysis”, “pre-dialysis” and “pre-dialysis”. We estimated the average amount of time (months) spent in each health state, which in turn was used to estimate total costs and quality adjusted life years (QALYs) during the two year time perspective. The model was populated with data from various sources: the eight clinical studies in the Cochrane review (disease progression and mortality), the Swedish Association of the Pharmaceutical Industry (drug costs), a regional price list of health care, and from previous published studies (cost for dialysis and health related quality of life).

Results: Patients receiving low protein diet spent on average 21.7 months in “pre-dialysis”, 1.9 months in “pre-dialysis”, and 0.4 months as “pre-dialysis”. The corresponding figures for patients receiving normal diet were 20.1, 3.3 and 0.6 months, respectively. The excess time of 1.4 month in pre-dialysis together with the reduced mortality resulted in 0.022 more QALYs (equivalent to 1.1 more weeks in full health) compared to patients on normal diet. The total average two-year cost for a patient receiving normal diets and low protein diet amounted to SEK 193 685 and 132 698, respectively. Hence the cost saving of low protein diet per patient amounted to SEK 60 687.

Conclusions: Low protein diet could be favourable not only for patients in terms of less time spent with dialysis and a better quality of life but also in terms of costs saved for the health care sector.

Introduction and Aims: Coronary artery calcifications (CAC) are more frequent in patients on dialysis (ESRD-patients) than in general population and rapidly proceed. Progression may cause further cardiovascular events. Greater prevalence and progression of CAC have been ascribed to exogenous calcium load consequent to high-calcium dialysate, and/or calcium phosphorus, i-PTH, homocysteine, C-reactive protein, triglycerides, total cholesterol, high- and low-density lipoprotein cholesterol were measured every 3 months. Progression of CAC was assessed measuring total calcium score (TCS) by computed tomography. Scans were obtained at start (initial) and end of observation period (final). Data of patients treated with CCPB and S were compared with those of non-treated CKD-patients (Controls; C).

Results: Seventy-six patients were enrolled in three groups: C, CCPB=22; S=27. Initial and final biochemical variables were unchanged but final TCS was significantly increased in three groups. TCS proceeded by 56% and 55% in patients treated with C and CCPB, respectively; and by 21% in those treated with S. Mean TCS and annualized progression were not different between patients treated with CCPB and C. No episodes of hypercalcemia were encountered. PTH remained unchanged. Patients free from CAC at the start remained non-calciﬁed at the end of the study.

Conclusions: Progression of CAC is rapid in CKD-patients despite baseline normality of mineral metabolism parameters and not exogenous calcium load. Progression was greater in patients treated with CCPB and C but small in those treated with S. Study design and small number of patients did not allow to determine in which manner S contributed to the beneﬁt on CAC progression. When prescription and reimbursement problem will be overcome, larger studies are mandatory to better establish the efﬁcacy of S in reducing CAC progression and event rate morbidity and mortality in CKD-patients.

Introduction and Aims: The prognosis of HIV infection has improved with the widespread use of HAART. The aim of this study was to know the prevalence of HIV infection in Spanish dialysis patients and the clinical proﬁle of the potential candidates for renal transplantation.

Methods: Prospective Spanish survey performed during the second trimester of 2006 using a standardized questionnaire to know the prevalence and characteristics of HIV infection in dialysis patients. Results: 177 (48%) Spanish Dialysis centres have answered the ongoing survey. 28 centres have HIV infected patients (15%). There were 12899 patients included in dialysis programs: 11866 in hemodialysis (HD), 1017 in peritoneal dialysis (PD) and 16 in home-HD. HIV prevalence was 0.48% (63 HIV positive patients). Prevalence in HD, PD and home-dialysis programs was 0.42%, 1.2% and 0%, respectively. The 63 HIV-infected patients under dialysis (50 in HD and 13 in PD) were analysed. Mean (range) age was 46 (29-73) years. 66% of cases were males. HIV risk factors were: parenteral HIV exposure in 51% (former drug abuse 93%; blood transfusions and others 7%); high risk sexual behaviour in 30% (heterosexuality 58% and homosexual 42%); multiple risk factors in 4.7% and known in 14.3%. Mean (range) time from HIV infection was 11.5 (1-26) years and time on dialysis was 4.9 (1-26) years. The most frequent aetiology of end-stage renal disease were glomerulonephritis (35%) followed by diabetes mellitus (15%). 25% of the diagnosis were proven by biopsy. Nine patients (14%) were in renal transplant waiting list. 43% of the patients had previous AIDS defining events and 85% were under HAART regiments. The median (range)
CD4 T-cell count was 335 cells/mm³ (16-845). 77% had undetectable viral load. 64% and 5.4% of patients have confections with hepatitis C and B viruses, respectively. 29% of patients have diabetes mellitus and 27% had previous cardiovascular events.

**Conclusions:** HIV seroprevalence in Spanish dialysis patients is 0.48%, being higher in PD than in HD. There are a high percentage of patients with hepatitis C coinfection, diabetes mellitus and previous cardiovascular complications. Most of the patients are in an immunological and virological good situation and under HAAART regimens. Some patients are in the renal transplant waiting list.

**FP194 RELATIONSHIP BETWEEN VITAMIN D STATUS, PARATHYROID HORMONE LEVELS AND BONE MINERAL DENSITY IN PATIENTS WITH CHRONIC KIDNEY DISEASE STAGES 3 AND 4**

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**Introduction and Aims:** Low vitamin D status is associated with secondary hyperparathyroidism and increased bone turnover in the general population and can aggravate the hyperparathyroidism of chronic kidney disease (CKD) patients. It is also correlated to low bone mineral density (BMD), but this correlation is less clear in CKD patients. Aims of our study were to investigate these associations in CKD stages 3 and 4 patients, and to identify significant predictors of BMD in this population.

**Methods:** Serum 25-hydroxyvitamin D levels (25OHD), BMD at the femoral neck (FN) and radius, and bone mineral metabolism parameters were measured in 89 CKD stages 3 and 4 patients. Patients with prior parathyroidectomy or who had received medication known to affect BMD, 25OHD or parathyroid hormone (iPTH) levels were excluded. Vitamin D status was defined as follows: serum levels between 40 – 75nmol/L= insufficiency, < 40nmol/L= deficiency and ≤ 12nmol/L= severe deficiency.

**Results:** Mean 25OHD levels were 53.8 ±3.2 nmol/L and correlated to the severity of proteinuria. Thirty-five patients (39%) had vitamin D insufficiency, 29 (33%) had vitamin D deficiency and 5 (6%) severe deficiency. Of the 89 patients, 2 had osteoporosis and 31 had osteopenia either at femur or radius. Thirty-five patients had low vitamin D and iPTH above target for the stage of CKD and should require vitamin D supplementation according to NKF/KDOQI guidelines, but 27 of them had Ca above 2.37 mmol/L that is the threshold for vitamin D therapy. In the multiple linear regression analysis, independent predictors for the FN T score were the iPTH levels (β = -0.37, P< 0.001) and the body mass index (β = 0.33, P= 0.001) for the model: adjusted R²= 0.196, P< 0.001. For the radius T score independent predictor was only the severity of proteinuria (β = -0.28, P= 0.008). Serum 25OHD levels were not directly associated with BMD, but they were independent predictors of iPTH (β = -0.32, P= 0.001), along with the estimated glomerular filtration rate (β= -0.37, P< 0.001) and the Ca levels (β= -0.2, P= 0.024), for the model: adjusted R²= 0.339, P< 0.001.

**Conclusions:** Calcium and vitamin D4 supplementation seems to be necessary in these patients. Limitation of this study is the small number of patients.

**FP195 HEPATITIS C VIRUS INFECTION IMPAIRS HEALTH-RELATED QUALITY OF LIFE IN HEMODIALYSIS PATIENTS**

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**Introduction and Aims:** Health-related quality of life (HRQOL) is impaired in hemodialysis (HD) patients. Hepatitis C virus (HCV) infection has negative impact on HRQOL in patients with normal renal function. However, HRQOL of HCV positive and negative HD patients was not compared specifically. We compared HRQOL of HCV positive and negative HD patients by using Short Form 36 (SF-36).

**Methods:** Patients performed SF-36 and Beck Depression Inventory (BDI). Hemodialysis dose was evaluated by single-pool Kt/V (spKt/V). Previous transplantation history, economical, marital and educational statuses, presence of coronary artery disease, diabetes and sleep disturbance was noted and laboratory parameters were recorded.

**Results:** Totally 173 patients (male/female: 112/61, age: 49.9 ±14.2 years, HD duration: 107.1±67.1 months) were included. Eighty-four were HCV positive, 89 were HCV negative. Hemodialysis duration (141.5±68.9 months vs 75.4±47.0 months, p<0.0001), BDI scores (23.1±8.9 vs 20±10.1, p= 0.036), aspartate aminotransferase, (19.7±15.0 U/L vs 14.2±7.1 U/L, p= 0.002), alamine aminotransferase, (23.6±24.0 U/L vs 14.3±10.8 U/L, p<0.0001) were higher, low density lipoprotein cholesterol (87.6±31.9 mg/dl vs 101.3±34.0 mg/dl, p=0.007) was lower in HCV positive patients when compared to HCV negative patients. Other biochemical parameters were not different between HCV positive and HCV negative patients. After adjusting for age, HD duration, spKt/V, BDI scores, transplantation history, economical, marital and educational statuses, coronary artery disease, diabetes and sleep disturbances, the results of HRQOL showed that HCV positive patients had worse scores in four subscales of SF-36 namely; general health (36.9±2.1 vs 44.6±2.0, p=0.016), physical functioning (51.4±3.2 vs 64.3±3.0, p=0.007), physical role (34.6±5.5 vs 51.8±5.2, p=0.036) and vitality (38.8±2.4 vs 48.2±2.3, p=0.011) when compared to HCV negative patients.

**Conclusions:** HCV positive hemodialysis patients tended to have higher depression scores than HCV negative patients. HCV infection seemed to have a negative effect on the health related quality of life in hemodialysis patients independently.

**FP196 RISK FACTORS OF INCREASED ATHEROGENICITY AND WATER OVERLOAD DURING CHRONIC KIDNEY DISEASE PROGRESSION ALSO REFLECT CARDIAC REMODELING**

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**Introduction and Aims:** Cardiac morbidity is increasing along with the progression of chronic kidney disease (CKD). This is due to the presence of traditional risk factors together with other factors that relate to renal failure itself. The aim of this study was to investigate the behavior of fibrinogen, apolipoprotein-A1 (apo-A1) and brain natriuretic peptide (pro-BNP) in the course of CKD progression and their relation to cardiac changes detected on echocardiogram.

**Methods:** In a cross-sectional observation, a population of 223 steady patients with CKD stages1 to 4 and a “high-risk” population with normal renal function from the out-patient clinics of two hospitals were studied with echocardiogram and apo-A1, fibrinogen and pro-BNP were measured in 223, 222 and 114 patients respectively and correlated to the echocardiographic findings.

**Results:** Increased fibrinogen levels and decreased levels of apo-A1 are found in atherosclerotic disease. In our study CKD progression was found to correlate positively with an increase in fibrinogen levels (p<0.000) and negatively with the levels of apo-A1 (p=0.005). CKD progression was also found to correlate positively with an increase in pro-BNP levels (p<0.000), probably reflecting the inability of the kidneys to maintain water and sodium balance leading to overload.

Interestingly, all three risk factors correlated also with cardiac changes detected on echocardiogram. Fibrinogen correlated positively with LV mass/BSA (p<0.0000), relative wall thickness (RWT) (p<0.0000), intraventricular septum (IVS) (p<0.000) and posterior wall (PW) (p<0.000). Pro-BNP levels also correlated positively with LVmass/BSA (p<0.000), with end-diastolic (p=0.035) and end-systolic diameter of the LV (p=0.025). In contrast, Apo-A1 showed a negative correlation with LVmass/BSA (p=0.02), RWT (p=0.009), IVS (p=0.028) and PW (p=0.001).

**Conclusions:** In conclusion, the increase of fibrinogen levels and the
Epidemiology of CKD I

Friday, June 22, 2007

FP197  ECHOCARDIOGRAPHIC EVIDENCE OF EARLY CARDIAC REMODELING DURING CHRONIC KIDNEY DISEASE PROGRESSION

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Introduction and Aims: The prevalence of cardiovascular disease (CVD) in chronic kidney disease (CKD) has been studied in a series of studies. Up to 80% of patients with end-stage renal failure have abnormal echocardiographic findings and this marks a prejudged course of these patients in chronic kidney disease (CKD) has been studied in a series of studies.

Methods: The study was to investigate the time point in the course of CKD that cardiac remodeling begins and this marks a prejudged course of these patients in CKD stages 1 to 4 from the out-patient clinics of two hospitals in the glomerular filtration rate decreases with age, the clinical significance of

Results: Prevalence of CKD for eGFR<60 was 56.1% (95% CI 55.3-57.0%), for eGFR<45 17.7% (95% CI 17.1-18.4), and for eGFR<30 2.7% (95% CI 2.4-2.9). Prevalence of all stages of CKD was higher in older groups, females, and those with cardiovascular co-morbidity and diagnosed hypertension but not diabetes. The associations with measures of morbidity and functional impairment increased as eGFR fell, especially once eGFR was <45. For example the odds ratios in females for anaemia for eGFR<30 and 30-44 and 45-59 vs reference GFR<60 were 5.69 (4.00-8.12), 1.51 (1.12-2.02) and 1.10 (0.87-4.41) respectively; similar figures for falls at home and poor physical activity were 1.50 (1.03-2.19) and 2.84 (2.16-3.74), 1.36 (1.14-1.62) and 1.38 (1.17-1.62), 1.06 (0.90-1.26) and 1.00 (0.87-1.16) respectively.

Conclusions: Stage 3-5 CKD is very common in older people. An eGFR below 45 identifies a smaller sub-group of older people who are more likely to have significant comorbidity, impaired functional state, and potentially reversible consequences such as anaemia. The benefits of identifying older people with eGFR<45 need to be determined.

FP198  PREVALENCE AND CROSS-SECTIONAL ASSOCIATIONS OF A REDUCED ESTIMATED GLOMERULAR FILTRATION RATE (eGFR) IN THE OVER-75 YEAR OLDS

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Introduction and Aims: Chronic kidney disease (CKD) guidelines have focused on the utility of the modified 4-variable MDRD equation (traceable by isotope dilution mass spectrometry IDMS). This formula accounts for variance in creatinine measured by an analyser different to that used when the original MDRD equation was devised. To assess theoretically and in practice the effect sizes of IDMS correction over the 4-variable MDRD equation in eGFR calculation with a range of UK creatinine methods and the subsequent impact of this on CKD prevalence.

Methods: MATLAB was used to generate a range of creatinine data (30-300umol/l) for male and female patients aged 20-100 years. The maximum differences between the IDMS and MDRD equations for all 14 UK laboratory techniques were explored with an averaged (IDMS + MDRD) eGFR less than 60mls/min and also 30mls/min. Similar procedures were applied to 712,540 samples (reflecting 5 creatinine methods in Northern Ireland), belonging to patients 18 years+, to explore graphically maximum differences in techniques. CKD prevalence using both estimation equation was compared.

Results: Simulated creatinine data indicates that the majority of creatinine procedures in the UK demonstrate small differences between the IDMS and MDRD methods in stages 4 and 5 CKD (where the averaged maximum difference for all laboratory methods was 1.27mls/min for females and 1.59mls/min for males). The MDRD equation deviated furthest from the IDMS results for the Endpoint Jaffe method: the maximum difference of 9.93mls/min for females and 5.42mls/min for males occurred at extreme ages and in those with eGFR reflecting stage 3 or higher disease. The real data graphically agreed with the theoretical results. Using existing data 93,870 patients yielded a first MDRD eGFR<60mls/min in 2001, 66,429 (71%) had a second test >3months later of which 47,093 (71%) continued to have an eGFR<60mls/min. This resulted in an estimated
crude prevalence of 3.97% for laboratory detected CKD in adults using the MDRD equation which reduced to 3.69% when applying the IDMS equation. Over 95% of this difference in prevalence was explained by older females with stage 3 CKD with data close to the stage 2 interface reemphasizing the need for further research into the subcategorisation of stage 3 CKD.

Conclusions: Improved accuracy of eGFR is obtainable by using IDMS corrected eGFR especially in early stage CKD; however our data suggests this will have little practical impact on stages 4-5 considering the current referral guidelines.

Conclusions: The percentage prevalence of early renal disease in subjects older than 60 years, otherwise considered as healthy in our setting, was 12%, whereas the presence of isolated microAlbU was 5% and reduced GFR was 7%. Individuals with nephropathy, tended to be older, have higher diastolic blood pressure and higher male sex proportion compared to those with normal renal function.

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patients without diabetes, but not when diabetes was present. Smoking was associated with the extent of CAC, especially in patients with diabetes. Phosphate levels were predictive of CAC in patients without diabetes, and parathyroid hormone levels were associated with the extent of CAC in the non-diabetic population and when all CKD patients were considered.

The presence of PAC on plain radiography identified patients with CAC on MSCT, with a sensitivity of 73%, a specificity of 28%, a positive predictive value of 44% and a negative predictive value of 76% indicating that it was not an adequate alternative screening marker for identifying patients with CAC.

Conclusions: CAC is common in CKD stages 3 and 4 patients, especially in those with diabetes. Further studies are needed to establish if lifestyle modifications (smoking cessation and weight management) and therapeutic strategies targeting iPTH and phosphate, can affect the prevalence and severity of CAC, delay its progression and finally reduce the very high cardiovascular disease risk seen in CKD patients.

**Factors Influencing Exercise Proteinuria in Young Healthy Persons**

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**Introduction and Aims:** The intensive physical activity is known as a cause of benign proteinuria. Although in the literature exist some studies describing exercise proteinuria (EP) the explanation of this phenomenon is not fully explained. The aim of the study was to estimate frequency of EP among healthy young participants of long distance march.

**Methods:** 115 participants of March on Orientation “Harpagan”, all males, who took at least 50-km walk in the forest had performed urinanalysis with test strips.

**Results:** 1. EP was found in 26 persons (22.6%), in all cases values reaching 30mg/dl. 2. There was no correlation between presence of EP and age of participants and durations of exercise. Specific gravity (SG) and pH of urine, as well as frequency of erytrocyturia and bilirubinuria were similar in both groups. Ketonuria was more frequent in participants with EP (tab.1). 3. Ketones were found in 75 participants (65.2%). There was not difference between participants with or without ketonuria with reference to age, gender and duration of exercise. Those with ketonuria had higher SG and lower pH of urine, proteinuria was common (tab. 2). 4. 54 participants answered questionnaire concerning diet and time of recovery. Participants with ketonuria took less fluids and kalories and were more exhausted after exercise.

**Conclusions:** Some interesting conclusions can be drawn from this very simple study. 1. After long exhausting march proteinuria occurs only in 20% of young healthy persons. 2. EP is always at minimal range (30mg/dl). 3. Presence of EP is not correlated with duration of exercise but rather with improper diet and may be improper training.

**The correlation between anthropometric measurements with serum insulin level and HOMA index**

<table>
<thead>
<tr>
<th>Serum insulin level</th>
<th>HOMA index</th>
</tr>
</thead>
<tbody>
<tr>
<td>r value</td>
<td>p value</td>
</tr>
<tr>
<td>Body mass index</td>
<td>0.32</td>
</tr>
<tr>
<td>Percentage of body fat</td>
<td>0.21</td>
</tr>
<tr>
<td>Waist circumference</td>
<td>0.24</td>
</tr>
<tr>
<td>Hip circumference</td>
<td>0.32</td>
</tr>
<tr>
<td>Arm circumference</td>
<td>0.32</td>
</tr>
<tr>
<td>Biceps skin fold</td>
<td>0.16</td>
</tr>
<tr>
<td>Triceps skin fold</td>
<td>0.11</td>
</tr>
</tbody>
</table>

**Conclusions:** Regarding to IR, in nondiabetic HD patients, BMI and arm circumference are more important anthropometric measurements.

**Ultrasoundographic Renal Dimensional Parameters Help Predict Renal Outcome in Patients with Chronic Renal Insufficiency**

Domenico Mancuso, Niconolino Comi, Michele Andreucci, Cinzia Donato, Pierangelica Presta, Giorgio Puiano. Nephrology, University Magna Graecia, Catanzaro, Italy

**Introduction and Aims:** Ultrasonography (US) of the kidney and urinary tract has become the primary modality for the evaluation of urinary diseases since number, location, size and shape of the kidneys, and the collecting system are accurately assessed. It has been shown that renal length and volume are correlated with age and body weight (BW), so that a variability of 5% is present in adults. Since renal length, volume and echogenicity are considered potential surrogate markers of single kidney function, US has been proposed as a screening modality to evaluate patients with chronic renal insufficiency (CRIpts). However, as yet, no study has specifically evaluated the correlation between renal US parameters and GFR levels when age, BW, BP and other parameters supposed to be correlated to GFR are simultaneously considered.
Methods: Aim of the study is to verify the relationship between renal US and functional parameters in CRpts (135 pts, stage 2-4 KDOQI) and in a control population (C: 315 healthy volunteers from the staff of two local hospitals). The same sample was evaluated after a two-year follow-up.

Results: Basal study. Mean age was 49.8±13 yrs, 47.22% male. Arterial hypertension was found in 63.7% of CRI pts and in none of C. Mean serum creatinine was 1.11 mg/dL in C group (range 0.67-1.23) and 3.75 mg/dL in CRF group (range 1.8-7.7). As compared to C, CRI pts presented significantly reduced the renal longitudinal diameter and volume in all CRI stages, while the transversal diameter and cortical thickness were significantly reduced only in pts with stage 3 and 4.

Follow-up. Observation lasted 24±2 months. CRF pts were divided in 4 quartiles according to their basal renal volume. In CRF group 23 pts presented 1 or 2 event failure (reduction >30% of basal GFR and/or start of hemodialysis) and 14 died (3 of these had started RDT). The relationship between these events and clinical, laboratory and US parameters was evaluated by calculating the hazard ratio for unit increase. Reduction of cortical thickness (in III and IV quartiles) and kidney volume (in all quartiles) were identified as risk-factors, as well as the increases in SBP (in all quartiles), DBP(in IV quartile), CaxP product, PTH (in III and IV quartiles), CRP and daily proteinuria in all quartiles. By contrast, normal serum albumine and Hb levels were identified as protective factors. By multivariate analysis, we showed that the every 10 cm³ of kidney volume reduction there is an increase of 18% of risk-events in C vs 38% in CRF pts. The reduction of cortical thickness increases the risk of events by 2% in C vs 21% in CRF patients. Both the risk of progression to ESRD and death were inversely related to the kidney volume (p<0.001 for both the events) at baseline.

Conclusions: Our data establish important correlation of US dimensional parameters with decline-rate of GFR and other non- or traditional risk factors in course of CRI. The simultaneous combination of morpho-dimensional and functional parameters could help to improve the accuracy of the follow-up in patients with CRI with possible therapeutical and prognostic implications.

**FP206 RENAL INSUFFICIENCY IN BONE METASTASIS CANCER PATIENTS: PREVALENCE AND IMPLICATIONS ON ANTICANCER DRUGS MANAGEMENT. SUBGROUP ANALYSIS OF THE IRMA STUDY**

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Introduction and Aims: The IRMA study reported the high prevalence of renal insufficiency (RI) in 4684 solid tumour patients, with a glomerular filtration rate (GFR) <90 mL/min for 50-60%. Furthermore, 80.1% were receiving nephrotic antinecancer drugs and 79.9% drugs necessitating dosage adjustment. We present the results for IRMA patients with bone metastasis (BM).

Methods: Subgroup analysis of IRMA patients with BM. Data collected: sex, age, weight, serum creatinine (SCr), bone metastasis (BM) and antinecancer drugs. The prevalence of SCr>110 µmol/L was assessed. GFR was estimated with Cockcroft-Gault (CG) and abbreviated MDRD (aMDRD) formulae. Drugs necessitating dosage adjustment and those potentially nephrotic were identified. Chi-square test was used to compare the prevalence of RI between patients with BM and patients without, for all patients and for breast cancer (BC) ones.

Results: 1000 patients (BC 577) with BM were included: median age 60, mean 59.8, weight 66 kg, 659 women. The prevalence of SCr>110 µmol/L was 8.3%. That of GFR<90 mL/min was 57.9% with CG and 54.7% with aMDRD. 83.4% of treated patients received at least one drug needing dosage adjustment (or no data) and 69% received at least one nephrotic drug. The prevalence of RI was not statistically different between patients with or without BM. However, the prevalence of RI was significantly higher in BC patients with BM as compared to BC patients without BM (62.1 versus 56.7%, p<0.04).

RI stages in IRMA patients with bone metastasis according to K/DQO/K/DIGO classification

<table>
<thead>
<tr>
<th>Stage of RI</th>
<th>GFR (mL/min or mL/min/1.73m²)</th>
<th>CG</th>
<th>aMDRD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>&gt;90</td>
<td>34.1</td>
<td>38.3</td>
</tr>
<tr>
<td>Stage 2</td>
<td>60-89</td>
<td>36.4</td>
<td>41.7</td>
</tr>
<tr>
<td>Stage 3</td>
<td>30-50</td>
<td>19.9</td>
<td>11.4</td>
</tr>
<tr>
<td>Stage 4-5</td>
<td>&lt;30</td>
<td>1.6</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Conclusion: RI is frequently high in cancer patients with BM. Appropriate evaluation of renal function necessitates CG or aMDRD calculation. In those patients, and especially in breast cancer patients with BM, anticancer drugs should be cautiously selected regarding their potential renal toxicity and need for dosage adjustment.

**FP207 BIOPSY IN OLDER PATIENTS. IT IS RECOMMENDED?**

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Introduction and Aims: During the last three decade (1974-2004), the percentage of patients older than 65 years who have been diagnosed by renal biopsy have increased progressively: 1974-1984: 6.8%; 1984-1194: 10.3%; 1994-2004: 24.78%.

Methods: In this period of time we have performed 1922 renal biopsies of native kidney in our centre.

Results: 60.5% Male/39.5% Female.320 patients (16.64%) were equal or older than 65 years (group A). 1602 (83.36%) were younger than 65 years (group B). Kidney biopsy in group A were taking in 39% because of nephrotic syndrome, in 33% due to rapidly renal insufficiency and in 11% due to nephritie proteinuria range. In group B were significantly lower (17.7%;3.35%;17.3%). The final diagnosis is showed on table 1.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>&gt;65 y Group A</th>
<th>&lt;65 y Group B</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vasculitis</td>
<td>17.8</td>
<td>2.71</td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>Amyloidosis</td>
<td>6.66</td>
<td>2.05</td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>Renal myeloma</td>
<td>4.12</td>
<td>0.58</td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>Membranous nephropathy</td>
<td>10.5</td>
<td>8.47</td>
<td>ns</td>
</tr>
<tr>
<td>Focal segmental scle</td>
<td>9.2</td>
<td>16.28</td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>IgA nephropathy</td>
<td>6.6</td>
<td>19.44</td>
<td>p&lt;0.05</td>
</tr>
</tbody>
</table>

Conclusions: Age of patients is cause of worsening renal function and also is accompanied of higher incidence secondary nephropathies. A high number of this secondary nephropathy could be treated effectively, for this reason we believe that renal biopsy must be performed even in older patients.

**FP208 CARDIOVASCULAR IMPLICATIONS OF COMMUNITY BASED DETECTION OF REDUCED GFR**

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Introduction and Aims: Chronic kidney disease is an asymptomatic condition managed by primary care physicians. We think that the use of Primary Healthcare Information System (OMI –AP, Stacks, Madrid community) and patients’ laboratory database to identify people with low GFR may be an effective strategy to prevent kidney disease and cardiovascular complications.

Methods: We studied in the sanitary area 2 of Madrid community a population of 64481 people older than 14 years, (48664 younger than 65 and 15817 older than 65) corresponding to 3 primary care centres.
Primary care data records were used to identify age, gender and clinical features of people who had creatinina measurement, between April 2004 and April 2008, performed in the health area laboratory as outpatients. The laboratory used the modified kinetic Jaffe assay with coefficient of variation of <3%. GFR was calculated by the abbreviated MDRD formula GFR ml/min/1.73 (Manjuthan Carp Oph Fup Hyptonner 2001).

Results: We found 33.662 creatinina test performed in 19059 different adults or 29% of the population. The proportion of the population with renal testing rose with age; it was 47.2% of those older than 65yr and 23.8% of patients younger.

10.093 patients, 15.2% of the entire population and 52.8% of those with test performed had Ccr between 60 and 90/ml/m; 2824, 4.2% of population and 11.8% of tested had Ccr <60. Considering older than 65yr we found 28% of population and 59.4% of those with test performed with Ccr 60-90/ml/m; 12.2% (25.6%) with Ccr <60.

The incidence of cardiovascular complications was higher in the group with Ccr<60: 65.1%HTA, 15.4% diabetics, 11.5 ischemic cardiopathy, 7.4% stroke, V.S 28.8%, 8.8%, 4.02%,2.2% in group with Ccr >60 (p<0.05).

Conclusions: Identifying individuals with reduced a GFR using laboratory procedures and the wide use of broad-spectrum antibacterial agents for ADPs were more severe. Most ADPs were predictable and possibly avoidable, considering the degree of CRI and co-morbidity; pharmacokinetics and nephrotoxicity of drugs; limitation of polypharmacy.

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Michal Nowicki2, 1Department of Biology and Medical Parasitology, Medical University, Łódź, Poland; 2Department of Nephrology, Hypertension and Kidney Transplantation, Medical University, Łódź, Poland

Introduction and Aims: Patients with chronic kidney disease are believed to be much more susceptible to fungal infections than healthy individuals due to coexisting immunity disorders, frequent invasive diagnostic/therapeutic procedures and the wide use of broad-spectrum antibacterial agents for bacterial infections. The aim of the study was to evaluate prevalence of fungi and its species in patients with chronic kidney disease.

Methods: In this cross-sectional study, 50 patients with chronic renal disease (22 M and 28 F; mean age 56±3.1 yrs) without history of kidney disease were included. All patients did not show any clinical signs of fungal infections and were not treated with antibacterial agents for at least 4 weeks. Specimens for microbiological examinations were taken from the oral cavity, faeces and urine (if available). In order to evaluate morphological and biochemical features of fungi the following methods were applied: 1. macrocultures in solid different media, 3. API 20 C AUX test.

Results: 385 samples for the mycological examinations were collected and 161 fungal strains were isolated from the samples. The fungi were isolated from 54 HD patients (96.4%), 32 CKD (64.0%) and 19 (63.3%) healthy subjects; the most frequently from oral cavity in HD (88.9%) and CKD patients (84.4%) and from faeces in healthy subjects (53.3%). The fungi in urine were detected in 4 HD patients (from all 33 samples collected from patients with residual diuresis), 10 CKD and none in healthy subjects. Monofocal mycosis was found in 29 HD (51.8%), 14 CKD (43.7%) and 11 healthy subjects (36.6%), and bifocal in 24 (44.4%), 15 (30.0%) and 8 (26.6%) subjects, respectively. The pathogens were identified the most frequently from oncomoses of the oral cavity and the rectum. Trifocal infections (in oral cavity, rectum and urinary tract) were found in only 1 HD and 4 CKD patients. The fungi were isolated from 64.3% CKD patients with 30 >GFR <60, 60.0% with 15 > GFR <30 and 83.3% with GFR <15 ml/min/m2 (p<0.001). From all isolated strains 156 belonged to the genus Candida, 2 to the genus Saccharomyces and the remaining 2 to the genera: Cryptococcus and Geotrichum. Candida albicans was the most frequently isolated pathogen from all groups of patients.

Conclusions: Prevalence of fungal infection in non dialysis patients with chronic kidney disease is similar to healthy subjects and increases in patients with more advanced CKD and those on HD. Fungal infections in haemodialysis patients are common and frequently more than monofocal.
Conclusions: Together with other known variables, PTH is an independent risk factor of coronary calcifications.

NATIONAL RENAL HEALTHCARE PROGRAM IN URUGUAY

Laura Solá, Emma Schwedt, Pablo Ríos, Nelson Mazzucchi, Renal Healthcare Committee, Montevideo, Uruguay; Renal Healthcare, National Fund of Resources, Montevideo, Uruguay

Introduction and Aims: Uruguay is a developing country with an established program (PR) for renal replacement therapy (RRT) for all patients (Pt) with end stage renal disease (ESRD) since 1980 (incidence: 149 pmp in 2005). A Pilot PR targeted to the Public assistance population of Montevideo was tried out supported by the Health Ministry and the National Fund of Resources, to guide the feasibility of a National Renal Healthcare Program (NRHP).

Methods: Improve Renal Healthcare (RH) in the entire population (POP) by the implementation of a NRHP for public and private assistance system by steps.

Specific Objectives:
1. Promote education for RH and healthy lifestyles in the POP
2. Integrate RH into the first level of assistance to promote early detection of CKD and set optimal timing of referral
3. Optimize Pt care in all stages to prevent or delay progression of CKD.

The expected CKD prevalence for people aged 20 or older (extrapolated from US data and adjusted for Uruguayan ESRD prevalence) is 6.7%.

Methods. The planned activities were to:
1) Inform the POP about healthy lifestyles and risk factors, through Primary Health Centers (PHC) teams, and massive diffusion media.
2) Integrate the RH in the First Level of assistance: a) designate a nephrologist (ND) to attend 2 hours a week for each 10000 POP aged 20 years and over. The Pt are referred by primary-care physicians (PCPs) or directly from the laboratory; b) Train the PCPs, dietitians and nurses on prevention and detection of at risk POP through education courses and guidelines; c) Plan the ND visits in a reference counter-reference system, depending on CKD stage, and d) Provide the renoprotective drugs.
3) Keep a longitudinal Registry of Pt with eGFR < 60 ml/min/1.73m², proteinuria > 300 mg/day or microalbuminuria > 30 mg/day in diabetics
4) Reduce drop out with an electronic alarm that informs when a Pt miss an appointment.
5) Derive Stage 4 Pt to a Pre-diarylsis Clinic, staffed by a formal multidisciplinary team (ND, Psychiatrist, dietitians, social worker, vascular surgery and nurses) committed to educate, give social and psychological support, and indicate the timely creation of the access for the selected dialysis modality.
6) Sign a contract of agreement between the NFR and the private and public healthcare institutions (HCl) progressively. For achieving comparable results it includes the implementation of the standardization of serum creatinine assay in each HCl with the Committee for Standardization and Quality Control (by calibration to an isotope dilution mass spectrometry (IDMS) reference method.

Results: The PR has been evaluated according to Structure indicators (IN) (hours of ND assigned to the target POP; Process IN (average number of new P per month); and Results IN (prevalence of CKD, P distribution by sex, age, stage and etiology, quality of care). The PR impact is measured by GFR changes, ESRD rate, and mortality rate.

Conclusions: The strategic framework of the NRHP has a continuous approach across primary, secondary and tertiary levels of prevention. Its feasibility has been proven by a pilot PR that now allowed the generalization of a NRHP in Uruguay.