

for splicing factor SRp40 in exon 11-*Alu* promoted its incorporation in the mRNA.

**Conclusions:** In conclusion, missense mutations in *CLCN5* can also induce the skipping of exons. To assess the real effect of some mutations, a transcript analysis is required. The exon skipping produced by the *Alu* insertion in exon 11 was due to the disruption of an exonic splicing enhancer.

*Funding sources:* Fundacion Canaria de Investigacion y Salud (FUNCIS, PI57/04) and Fondo de Inversion Sanitaria (FIS, PI042620)

#### MP170 EARLY MARKER OF RENAL DYSFUNCTION IN PATIENTS WITH SICKLE CELL/BETA-THALASSEMIA

Charalampos Stathakis<sup>1</sup>, E. Voscaridou<sup>2</sup>, E. Terpos<sup>3</sup>, D. Smirloglou<sup>4</sup>, P. Papadopoulou<sup>5</sup>. <sup>1</sup>Division of Nephrology, General Laiko Hospital, Athens, Greece

**Introduction and Aims:** Progressive renal failure is one of the main complications in HbS/β-Thalassemia (HbS/β-Thal). Early identification of patients at high risk of developing renal failure is of great importance as it may allow specific measures to delay the progression of renal damage and thus reduce the incidence of end stage of renal failure and mortality. Early predictors of renal impairment in HbS/β-Thal remain to be explored.

**Methods:** We studied 87 HbS/β-Thal patients (36 males, 51 females, median age 39 ys) and 30 healthy controls in addition to conventional renal biochemistries we measured serum cystatin - C (Cys-C), urine N - acetyl - β - d - glycosaminidase (NAG) excretion and serum and urinary β2 - microglobulin (β2M).

**Results:** Cys - C, NAG and serum β2M levels were higher in patients than controls. The incidence of patients with high levels of Cys - C, NAG and β2M was 31.1%, 74.7%, and 70.1%, respectively, while only 6% of patients had increased serum creatinine levels. Cys - C and serum β2M showed a strong correlation with creatinine clearance and age, while NAG positively correlated with proteinuria. An inverse correlation was also shown between hemoglobin and β2M, NAG and Cys - C levels. Seven patients with proteinuria received therapy with ACE - inhibitors. Changes of proteinuria positively correlated with NAG levels.

**Conclusions:** These results indicate that Cys - C is an accurate marker of renal dysfunction and urinary NAG excretion can be considered as reliable index of tubular toxicity and possible predictor of proteinuria and eventual renal impairment in HbS/β-Thal patients. Furthermore NAG measurement may be used for monitoring ACE - inhibitors therapy in HbS/β-Thal patients with proteinuria.

#### MP171 LITHIASIS COMPLICATION IN AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE: AN EXPERIENCE OF 15 YEARS

Ariana Strakosha<sup>1</sup>, Alma Idrizi<sup>1</sup>, Myftar Barbullushi<sup>1</sup>, Katjusha Bakallbashi<sup>2</sup>, Teuta Dedej<sup>2</sup>, Nestor Thereska<sup>1</sup>, Sulejman Kodra<sup>1</sup>, Alketa Koroshi<sup>1</sup>. <sup>1</sup>Service of Nephrology; <sup>2</sup>Department of Biochemistry, UHC "Mother Teresa", Tirana, Albania

**Introduction and Aims:** Nephrolithiasis is an important manifestation of autosomal dominant polycystic kidney disease (ADPKD), which ranges from 8% to 36% in different studies. It is not only common, but it is also a frequent cause of morbidity and is common in women as in men. Half of ADPKD patients (pts) are symptomatic and 20% require surgical removal of the stones. We have studied the frequency and responsible factors of nephrolithiasis in 180 ADPKD pts during a period of 15 years.

**Methods:** For anatomic evaluation, the patients underwent renal ultrasonography to determine cyst number, predominant cyst size and stones. A plain abdominal X-ray for some pts was performed. For metabolic evaluation urinalysis, urine culture, urinary pH, calcium, oxalate, citrate, uric acid, phosphate, magnesium, creatinine levels in a 24-h urine specimen were performed in all pts. Serum calcium, phosphate, uric acid, magnesium, and creatinine levels were also determined.

**Results:** Kidney stones were present in 81 of our ADPKD pts (45%), with a mean age 40±4.2 years (range from 16 to 67 years). Forty-six of pts with nephrolithiasis (61%) were women. 75% of our pts were symptomatic and only two of them (3.6%) required the surgery. The stones were composed primarily of urate (47%) and calcium oxalate (39%), and other compounds

14%. The calculi were associated with an abnormal low urinary pH (5±0.3) (62%). Of the pts studied, hypocitraturia was found in 43%, hyperuricemia in 28%, hyperoxaluria in 17%, hyperuricosuria in 42%, and hypercalciuria in 12%. In 40% of pts the presence of calculi was associated with a history of urinary tract infections and flank pain.

**Conclusions:** In our study nephrolithiasis was present in 45% of pts, more than the frequency reported in literature. Both anatomic and metabolic factors are believed to contribute to stone formation in our ADPKD pts, as reported in literature. But, on the other hand, this high frequency of nephrolithiasis in our pts may be related to the fact that Albania is being considered as an area for endemic urinary stone disease.

## Clinical nephrology 2

#### MP172 THE INTERFERON THERAPY OF THE CHRONIC VIRAL HEPATITIS C AT THE HEMODIALYSIS PATIENTS

Aurelian Ovidiu Simionescu, Livia Simionescu, Ileana Mihailescu, Mircea Moisa. *Nefrology, County Hospital, Slatina, Olt, Romania*

**Introduction and Aims:** The batch of study was composed by 15 patients in hemodialysis from the Hemodialysis Centre of Slatina with marks of viral retort, having a length of service medium in dialysis of 45,08 months, having a age between 45-62 years, 92,31% from the patients were men and 7,69% were women and their origin place was 15,4% from the town and 84,6% from the village.

**Methods:** The Methodology of work consisted in administer of α2a PEG Interferon 135 μg/week starting by the month of August 2004 for 12 months, at the patients from the program of chronic hemodialysis; the treatment was biochemical and viruliferous monitorised and it was overseed the appearance of adverse effects.

**Results:** At the beginning of the study, 15, 38% from the patients (2 patients) had a lower viral charge (<10 KU.I/ml); 53,85% from the patients (9 patients) had a medium viral charge (10-500 KU.I/ml) and 30,77% (4 patients) had a high viral charge (> 500 KU.I/ml).

At 20% from the patients (3 patients) it was stopped the treatment after 12 weeks because of the lack of compliance.

After 12 weeks of treatment 80% from the patients (12 patients) rest in the study, 60% (9 patients) showed both biochemical and viruliferous answer (normal transaminases and negative viremy), and 20% from the patients (3 patients) showed higher transaminases, but having lower values than those from the beginning of the treatment and having also a persistent viremy.

Regarding the adverse effects all the patients showed a minore symthomatologie: 6 patients showed fever at the first measure administered and 2 patients had artralgies.

All the 15 patients had trombocytopeny:

- 9 patients (53,85%) showed an easy trombocytopeny (Tr = 100 000-150 000/mm<sup>3</sup>);
- 6 patients (46,15%) showed temperate trombocytopeny (Tr < 100 000/mm<sup>3</sup>).

13 patients (84,62%) showed easy leucopeny (Lc < 4 000/mm<sup>3</sup>).

**Conclusions:** The treatment was efficacious, so that after 12 weeks of treatment the viruliferous answer was for 80% (12 patients).

At only 20% (3 patients) it hadn't obtained the viruliferous suitable answer, so what it was stopped the treatment with Ifn.

At 6 patients (46,15%) the ones having a temperate trombocytopeny only for a month the measure of Peg - Ifn α2a had to be lower.

During the treatment with Ifn, no one patient didn't show severe trombocytopeny (Tr < 45 000/mm<sup>3</sup>) which could require the interruption of the treatment.

We intend to repeat the viremy at 6 months from the interruption of treatment, and we shall communicate later on the results.

### MP173 THE ROLE OF MYOFIBROBLASTS IN INTERSTITIAL FIBROSIS IN PATIENTS WITH CHRONIC GLOMERULONEPHRITIS

Flaviu Bob<sup>1</sup>, Gheorghe Gluhovschi<sup>1</sup>, Cristina Gluhovschi<sup>1</sup>, Elena Potencz<sup>2</sup>, Diana Herman<sup>2</sup>, Virginia Trandafirescu<sup>1</sup>, Adalbert Schiller<sup>1</sup>, Ligia Petrica<sup>1</sup>, Silvia Velciov<sup>1</sup>, Gheorghe Bozdog<sup>1</sup>.  
<sup>1</sup>Nephrology, U of Med, Timisoara, Romania; <sup>2</sup>Histology, U of Med, Timisoara, Romania

**Introduction and Aims:** The main effector cells of fibrogenesis seem to be myofibroblasts, that participate in the production of extracellular matrix, leading thus to tubulo-interstitial fibrosis. Immunohistochemical markers that indicate the presence of these cells are  $\alpha$ -smooth muscle actin (SMA) and vimentin (Vim). A lot of growth factors participate in the above mentioned processes, among them of great importance is the transforming growth factor  $\beta$  (TGF  $\beta$ ).

**Methods:** We studied a group of 41 patients (p) with primary and secondary glomerulonephritis [M-24p, F-17p, mean age  $45.5 \pm 12.9$ y]. All p underwent kidney biopsies which were processed in light microscopy. In order to quantify the histological changes and to assess the extent of active-inflammatory and chronic-sclerotic/fibrotic lesions, we adapted a scoring system that was initially used only for lupus nephritis and ANCA-associated vasculitis. Using this score we obtained a total activity and a total cronicity index. We also performed immunohistochemistry procedures with monoclonal antibodies (performed with the LSAB-HRP system: anti-SMA, anti-Vim and anti TGF $\beta$ ), which were assessed using a semiquantitative score, that was correlated with the histological data, proteinuria, serum creatinine and glomerular filtration rate (GFR). Results were analysed by statistical methods (Pearson's test, Spearman's rank order test) using WinStat for microsoft Excel (R-correlation coefficient).

**Results:** We found that interstitial expression of SMA correlates with the interstitial infiltrate (R=0.40, p=0.01), with the total activity index (R=0.35, p=0.03), with the total cronicity index (R=0.35, p=0.03), with interstitial fibrosis (R=0.3, P=0.06), tubular atrophies (R=0.27, p=0.08) and vascular hyalinosis/fibrosis (R=0.28, p=0.08). No statistical correlation was found with proteinuria, serum creatinine or GFR. Interstitial Vim correlates with interstitial infiltrate (R=0.43, p=0.003), interstitial fibrosis (R=0.45, p=0.002), tubular atrophies (R=0.31, p=0.03), vascular hyalinosis/fibrosis (R=0.3, p=0.03) and cronicity index (R=0.4, p=0.007). We also found an indirect statistical correlation with proteinuria ( $r=-0.29$ , p=0.03) and with GFR (R=-0.38, p=0.009). A strong correlation was found between the interstitial expression of SMA and Vim (R=0.65, p<0.0001). Interstitial TGF $\beta$  expression correlates with interstitial fibrosis (R=0.48, p=0.0006), with tubular atrophies (R=0.41, p=0.003), with vascular hyalinosis/fibrosis (R=0.34, p=0.01), with the cronicity index (R=0.41, p=0.003) and with GFR (R=-0.27, p=0.04).

**Conclusions:** The presence of SMA and Vim in the interstitium, as well as their correlation with interstitial histological elements suggests the role played by myofibroblasts in fibrogenesis. An important mediator role in this process seems to be played by TGF $\beta$ , whose expression at the interstitial level correlated with histological and biological elements.

### MP174 EARLY DIAGNOSIS OF KIDNEY DISEASES – PRELIMINARY REPORT FROM THE POLNEF STUDY

Ewa Krol<sup>1</sup>, Boleslaw Rutkowski<sup>1</sup>, Piotr Czarniak<sup>2</sup>, Ewa Kraszewska<sup>3</sup>, Slawomir Lizakowski<sup>1</sup>, Radoslaw Szubert<sup>4</sup>, Stanislaw Czekalski<sup>5</sup>, Wladyslaw Sulowicz<sup>6</sup>, Andrzej Wiecek<sup>7</sup>. <sup>1</sup>Department of Nephrology, Transplantology and Internal Diseases, Medical University of Gdansk, Gdansk, Poland; <sup>2</sup>Department of Pediatric Nephrology, Medical University of Gdansk, Gdansk, Poland; <sup>3</sup>Division of Clinical Research and Biostatistic, Center of Oncology, Warszawa, Poland; <sup>4</sup>NZOZ, PolMed, Starogard Gdanski, Poland; <sup>5</sup>Department of Nephrology, Transplantology and Internal Diseases, Medical University of Poznan, Poznan, Poland; <sup>6</sup>Nephrology Department, Collegium Medicum of Jagiellonski University, Kraków, Poland; <sup>7</sup>Department of Nephrology, Endocrinology and Metabolic Diseases, Medical University of Katowice, Katowice, Poland

**Introduction and Aims:** Continuous increase of the number of patients with chronic kidney failure which require renal replacement therapy, as well in Poland as all over the world, demands the analysis of epidemiological

situation concerning renal diseases. Early diagnosis of chronic kidney disease permits not only an adequate treatment of nephropathy, but also facilitates the introduction of the therapy that slows the progression of kidney failure. The aim of the pilot study PolNef was an attempt to evaluate the epidemiology of chronic kidney disease.

**Methods:** 9700 invitations have been sent to randomly selected adult inhabitants of a 60 thousand city. As a screening test, allowing distinguishing patients requiring further diagnosis of nephropathy, the microalbuminuria dipstick test accompanied by blood pressure measurement and questionnaire was accepted. GFR was estimated from serum creatinine using the Cockcroft-Gault formula (eGFR).

**Results:** 2475 individuals (1536 F, 939 M) participated in the pilot PolNef study. Albuminuria was detected in more than 16% of the investigated population. It was significantly more frequent in male and in obese. Characteristics of participants with albuminuria was given in table below. 501 persons with albuminuria and/or nocturnal polyuria or family history of kidney disease were referred to nephrologist. Decreased eGFR was found in about 47% of those participants referred to nephrologist, and more than 17% of them had eGFR below 60 ml/min/1.73 m<sup>2</sup>.

#### Characteristics of participants with albuminuria

Positive dipstick test for albuminuria [n]	402
Female/Male [n]	222/180
Diabetes mellitus [n (%)]	49 (13.1%)
Hypertension [n (%)]	168 (44.8%)
No diabetes, no hypertension [n (%)]	193 (51.5%)
Abnormalities in urinalysis [n (%)]	41 (10.9%)
Nocturnal polyuria [n (%)]	131 (35%)
Obesity [n (%)]	99 (26.4%)
Smoking [n (%)]	109 (17.6%)

**Conclusions:** Albuminuria occurs frequently in the examined population and together with blood pressure measurement and questionnaire seems to be a powerful tool to identify subjects at risk for chronic kidney disease.

### MP175 ACUTE RENAL FAILURE IN NEONATES

Hasan Otukesh, Hadi Samaiee, Rozita Hoseini, Mohammad Reza Amantchi, Pedram Golnari. *Ali Asghar Hospital, Iran University, Tehran, Iran; Ali Asghar Hospital, Iran University, Tehran, Iran; Ali Asghar Hospital, Iran University, Tehran, Iran; Ali Asghar Hospital, Iran University, Tehran, Iran*

**Introduction and Aims:** Acute renal failure (ARF) is a sudden declining in renal function over hours or days. Unfortunately regarding to several advanced therapeutic techniques, ARF still has poor prognosis among children. For these reasons, it would be more effective to utilize prognostic indicators in the commencing of disease, in order to identify those patients that could receive more benefit from early aggressive treatment.

**Methods:** In this study, the etiology and prognostic parameters of acute renal failure in 56 neonates that referred to Ali-Asghar children hospital from 1995 to 2003 were assessed. Also, several risk factors proposed as indices of poor prognosis such as sepsis, respiratory distress, and so on were assessed. Statistical analyses were multiple regression and chi-square.

**Results:** A total of 3925 neonates were treated in our NICU during the 8 years study period, and 56 of these babies had ARF. The frequency of ARF in the NICU during the study period was 1.42%. Premature newborns constituted 35.7% (20/56) of the cases. Feeding problems was the most frequent contributing condition (n=29, 52%) followed by sepsis (n=25, 45%) and congenital disorder (n=2, 3.5%). In this study Overall the mortality rate among these patients was 51.8%. In this study, anemia, necessity of mechanical ventilation, duration of Oligoanuria, shock, GI bleeding, hypotension, hyponatremia, severe metabolic acidosis were more common in term neonates that died out (p<0.05). In pre-term neonates we found the significant relationship between need of ventilation, hypocalcemia and death.

**Conclusions:** The study showed that, at our institution, ARF in the neonatal period is frequently associated with preventable conditions, specifically sepsis and feeding problems. Supportive therapy is effective in most cases of neonatal ARF. Early recognition of risk factors and rapid effective treatment of contributing conditions will reduce mortality in neonatal ARF.

### MP176 RENAL ABNORMALITIES IN LEPROSY – PROSPECTIVE STUDY ON 59 PATIENTS

Rodrigo Oliveira<sup>1</sup>, Clodoaldo José Souza<sup>1</sup>, Eduardo Vieira<sup>1</sup>, Geraldo Silva-Júnior<sup>1</sup>, Rosa Mota<sup>2</sup>, Paula Frassinetti Fernandes<sup>1</sup>, Elizabeth Daher<sup>1</sup>. <sup>1</sup>Department of Internal Medicine, Faculdade de Medicina, Universidade Federal do Ceará, Fortaleza, Ceará, Brazil; <sup>2</sup>Department of Statistics, Universidade Federal do Ceará, Fortaleza, Ceará, Brazil

**Introduction and Aims:** Renal lesions in Leprosy have been first described in the beginning of the last century. This study was performed to determine the prevalence of renal function abnormalities in leprosy, to evaluate the glomerular and tubular function, the risk factors for renal impairment and if the paucibacillary (PB) or multibacillary (MB) forms increase the chance to develop nephropathy.

**Methods:** This study was cross-sectional. Fifty nine leprosy patients were studied. They were in specific treatment without reacional state and without co-morbidities that could be responsible for renal dysfunction. The study was done in the countryside of Brazil, from January to December 2004. A control group with 18 patients was used. They were kidney donors preparing for nephrectomy. All patients were submitted to glomerular and tubular evaluation.

**Results:** The mean age in the study group was 43±15 years, 30 (51%) men, 30±7 years in control group with 13 men. The mean time of disease was 22±28 months and the mean time of treatment was 4±4 months. Patients were classified in 31 paucibacillary and 28 multibacillary. We detected decrease in GFR in 30 patients (51%); urinary concentration defect, measured by U/P<sub>osm</sub><2.8 in T<sub>4</sub>, in 47 (80%) patients after concentration test with DDAVP; urinary acidification defect, measured by U<sub>pH</sub><5.35 in T<sub>4</sub> in 26 (44%) patients after acidification test with CaCl<sub>2</sub>; proximal tubular dysfunction, measured by FE<sub>Na+</sub>>1.6%, in 7 (12%). Microalbuminuria was present in 6 patients (13%). Hematuria was present in 16 cases (27%) and urinary albumin excretion in 24 hours up to 150mg in 2 patients. P<sub>cr</sub>>1.2 mg/dl was more frequent in MB patients (p=0.020). The other renal function tests were not different between PB and MB. Negative correlation was observed between GFR and age (p=0.008; r=-0.567). Positive correlation was observed between P<sub>cr</sub>>1.2mg/dl and mean time of treatment (p=0.003; r=0.380) and between FE<sub>Na+</sub> and FE<sub>K+</sub> (r=0.601; p<0.001). Significant correlation weren't found between globulin and U<sub>pH</sub> in T<sub>4</sub>(r=0.203; p=0.110) and U/P<sub>osm</sub> in T<sub>4</sub> (r=-0.058; p=0.720). The age was risk factor for development of defect in urine concentration (p=0.009). Positive bacilloscopy (p=0.008; OR 4.1 [1.2; 13.7 CI 95%]) and age (p=0.001; OR 9.3 [0.8; 101.9; IC 95%]) were risk factor for decreased GFR. Statistic difference were observed when we compared PB and MB with control group in relation to glomerular and tubular tests (p=0.001).

**Conclusions:** The prevalence of renal dysfunction was high. Hanseniasis causes frequently asymptomatic GFR changes and specific tubular dysfunction as defective of urine concentrating and acidifying mechanisms. Positive bacilloscopy, age and duration of treatment influenced the development of renal dysfunction.

### MP177 EXTREME OBESITY (EO) AND RENAL LESIONS: A CLINICAL AND PATHOLOGICAL STUDY OF PATIENTS WITH NO CLINICAL EVIDENCE OF RENAL INVOLVEMENT

A. Serra<sup>1</sup>, R. Romero<sup>1</sup>, D. Lopez<sup>2</sup>, M. Navarro<sup>1</sup>, N. Berenguer<sup>3</sup>, B. Bayes<sup>1</sup>, J. Bonet<sup>1</sup>, A. Alastrue<sup>3</sup>. <sup>1</sup>Nephrology; <sup>2</sup>Pathology; <sup>3</sup>General Surgery Departments, Hospital Universitari G. Trias i Pujol, Badalona, Barcelona, Spain

**Introduction and Aims:** EO is typically related to type 2 diabetes mellitus (T2DM), arterial hypertension and cardiovascular disease. Development of renal lesions in the setting of EO could be due to the effects exerted on the kidney by T2DM, hypertension or obesity (so-called "obesity kidney", encompassing focal and segmental glomerulosclerosis (FSGS) and/or glomerulomegaly).

The aim of the present prospective study was to determine the still unknown frequency of renal lesions in EO patients with no clinical evidence of renal involvement and who were submitted to bariatric surgery (BS).

**Methods:** 90 EO (34M,56F) with a mean obesity evolution time of 236 (107) months and no evident clinical renal involvement were included in

the study. The control group consisted of 40 (23M,17F) nephrectomized or kidney-donor adults who were free of DM, hypertension or obesity. Blood pressure, fasting glucose, total cholesterol, creatinine serum levels and 24-h proteinuria were determined. Renal biopsy was performed during BS. Both cases and controls were evaluated with the aid of routine light microscopic techniques and image analysis. Additionally, EO patients' renal biopsies were studied by direct immunofluorescence.

**Results:** Of the 90 EO patients, 3 (3.3%) showed evidence of FSGS, whereas IgA nephritis was present in 1 (1.1%). Table 1 summarizes other relevant clinical and morphological findings of both EO patients and controls.

	EO n=90	Controls n=40	p
Age (years)	41.4 (10.1)	42 (12.9)	n.s.
BMI (kg/m <sup>2</sup> )	52 (46.9-58.3)	24.6 (22-26)	< 0.001
Hypertension	58%	0	< 0.001
Fasting glucose mmol/l	5.2 (4.9-6.4)	5.1 (4.7-5.5)	<0.05
total Cholesterol (mmol/l)	4.9 (1)	4.6 (1.1)	n.s.
Creatinine (umol/l)	80.7 (12)	83.7 (19.8)	n.s.
Proteinuria g/24h	0.14 (0.09-0.32)	0.10 (0.10-0.12)	< 0.001
Mesangial matrix increased	52 (58%)	2 (5%)	<0.001
Mesangial cell proliferation	18 (20%)	0 (0%)	0.002
Podocyte hypertrophy	38 (42%)	0 (0%)	<0.001
Arteriolar lesions	35 (39%)	10 (25%)	n.s.
Arterial lesions	25 (28%)	8 (21%)	n.s.
Interstitial fibrosis	65 (72%)	6 (15%)	<0.001
Tubular atrophy	25 (28%)	4 (10%)	0.043
Glomerular area um <sup>2</sup>	23292 (6016)	18053 (5859)	<0.05

**Conclusions:** EO patients showed renal lesions with a significantly higher frequency than control subjects. These renal lesions predominantly consisted of glomerular area increases, mesangial matrix expansion, mesangial cell proliferation, hypertrophy of podocytes, and interstitial fibrosis. Also worth mentioning is that in our EO patients the prevalence of FSGS was below that reported in the literature in EO, a finding that is in consonance with the lack of evident clinical renal involvement of our cases.

### MP178 URINE SPECIFIC GRAVITY AS A MARKER OF OSMOLARITY: LESSONS FROM PATIENTS WITH HYPONATREMIA

Vasant Sumethkul, Kittivan Choojitarom, Piyanuch Radinahamed, Jatuporn Ruangraksa. *Medicine, Ramathibodi Hospital, Bangkok, Thailand*

**Introduction and Aims:** Value of U<sub>osm</sub> was formerly believed to be predicted by the formula: U<sub>osm</sub> = [U specific gravity - 1] x [30,000-40,000] (conventional formula). Recently, measurement of U<sub>spgr</sub> has been widely changed from refractometry to strip test method. There is no prior study that determine the correlation of U<sub>spgr</sub> (strip test) and actual U<sub>osm</sub> in patients with hyponatremia (HypoNa). Our objectives are to prospectively determine the correlation of U<sub>spgr</sub> (strip test) with actual U<sub>osm</sub> in patients with HypoNa. The precision of the conventional formula in predicting U<sub>osm</sub> in these patients was also verified.

**Methods:** U<sub>spgr</sub> was measured by strip test (Combur<sup>10</sup>Test<sup>®</sup>M) and reported by automated machine (Minitron). U<sub>osm</sub> and S<sub>osm</sub> was measured by freezing point depression technique. Enrolled patients were hospitalized patients who had hypoosmotic HypoNa (serum Na < 130 meq/L and actual S<sub>osm</sub> < 280 mOsm/kg: freezing point technique). Values of actual U<sub>osm</sub>, U<sub>spgr</sub>, and urine sodium (UNa) were measured by the same urine sample at the diagnosis of HypoNa. Patients who had DM, serum creatinine > 1.2 mg/dl or received hyperosmotic agents were excluded. Other investigations included fasting serum cholesterol, triglyceride, cortisol, and thyroid function test. Patients were classified to five groups: hypovolemic HypoNa (hypovol), hypervolemic HypoNa (hypervol), diuretic induce HypoNa (diuretic), syndrome of inappropriate ADH secretion (SIADH) and low solute intake (low-sol). Patients with hypothyroidism and hypogluco-cortisolism were grouped with SIADH. Values were presented as mean ± SD. Linear regression analysis was used to determine the correlation of parameters of interested.

**Results:** Eighty two patients were enrolled. Serum Na was 119±7.8 meq/L. Actual S<sub>osm</sub> was 257±19.3. Serum cholesterol and triglyceride was 163±45 and 129±91 mg/dl. Actual U<sub>osm</sub> was 348±138. U<sub>spgr</sub> was 1.014 ±0.004. UNa was 49.6±38.2 meq/L. Diagnosis of hyponatremia were: hypovol (n = 25), hypervol (n = 2), diuretic (n =27), SIADH (n

= 25), low-sol (n = 3). Actual Uosm and Uspgr of SIADH was  $366 \pm 132$  and  $1.014 \pm 0.004$ . The corresponding values for diuretic group and hypovol group was  $365 \pm 136, 1.011 \pm 0.003$  and  $361 \pm 126, 1.018 \pm 0.004$  respectively. Actual Uosm and Uspgr was lower in low-sol ( $95.6 \pm 6.6$  and  $1.008 \pm 0.002$ ) than the others ( $355 \pm 128.8$  and  $1.014 \pm 0.004$ ). UNa was higher in diuretic ( $66.5 \pm 46.5$ ) than the others ( $32.8 \pm 19.1$ ). Regression analysis found that there was a linear correlation between Uspgr and actual Uosm with a regression coefficient (r) of 0.25 (p = 0.023; adjusted  $r^2 = 0.13$ ). Six patients had values of actual Uosm within the range of that predicted from Uspgr by conventional formula. Accuracy of conventional formula was thus 14.6%. Determination of a multiplying factor to predict Uosm from Uspgr was calculated by a formula: multiplying factor = Mean actual Uosm/Mean Uspgr-1. This resulted in a value of 22.

**Conclusions:** In HypoNa with varieties of causes, the strip test derived Uspgr has a linear correlation with actual Uosm. However, the precision of conventional formula is not good. Uosm can be better predicted by multiplying the last two digit of Uspgr with a factor of 22.

#### MP179 HOW TO ANALYZE SURVIVAL DATA WHERE MULTIPLE EVENTS MAY OCCUR WITHIN THE SAME SUBJECT: EXAMPLES IN NEPHROLOGY

Pietro Ravani<sup>1,3</sup>, Brendan Barrett<sup>1</sup>, Veeresh Gadag<sup>2</sup>, Fabio Malberti<sup>3</sup>.  
<sup>1</sup>Clinical Epidemiology Unit, Faculty of Medicine, Memorial University of Newfoundland, St John's, NL, Canada; <sup>2</sup>Division of Community Health, Memorial University of Newfoundland, St John's, NL, Canada; <sup>3</sup>Divisione di Nefrologia e Dialisi, Azienda Istituti Ospitalieri, Cremona, Italy

**Introduction and Aims:** Recurrent events in the same subjects are common in medical research on many diseases. Examples in Nephrology include ordered events of the same type such as repeated vascular access failures, peritonitis or rejection episodes; and unordered events of different types such as non-fatal cardiovascular events, end-stage renal disease and death. Yet, appropriate statistical tools for such event rates analysis require the recognition that some individuals may be especially likely to experience recurrent events and that this correlation of the failure-times violates the independence assumption required in traditional survival analysis.

**Methods:** We applied two extensions of the Cox's regression model that have gained popularity in the recent years (i.e., variance-corrected methods [VCM] and frailty models [FM]) to two sets of survival data from cohort studies in chronic kidney disease patients: the study on the risk of end-stage renal disease and death associated with ADMA prior to dialysis (competing risk data); and the recurrent process of AV access failures (recurrent events process). Methodological issues we aimed to address vs. traditional survival analysis (time to first event only) concerned the underestimation of the variability of the estimated effects (hazard ratios); analysis power; and identification of the potential sources of correlation in the data, i.e., heterogeneity (difference in the baseline risk in general across individuals) and event dependence (differences in the baseline risk within subjects after previous events have occurred).

**Results:** As compared to the time to first event analyses (both considering competing risk for events of different type and recurrent process of ordered events) VCM and FM made more efficient use of the information in the data. The increased power allowed control for more confounders and identification of individual components within the cardiovascular risk factors that had to be aggregated in analyses of the first event only. In presence of event dependence without important heterogeneity stratified procedures in both VCM and FM successfully accounted for the correlation in the data. In presence of important heterogeneity FM performed better. Stratified FM appeared a modeling strategy robust to both heterogeneity and event dependence.

**Conclusions:** Appropriate tools exist to analyze multiple-failure time data which make use of all the information in the data and have the potential to provide measures of disease burden in a population often more relevant and clinically interpretable than considering only the first event that occurs. The choice of the appropriate procedure depends on the event type and order defining the nature of the overall process; on the sources of correlation in the data; and on the clinical question at hand. These models appear to be of special interest for epidemiological research in Nephrology.

#### MP180 STANDARDIZATION AND EVALUATION OF MAGNETIC BEAD-BASED URINE PROTEOME PROFILING WITH MALDI-TOF MS FOR THE DETECTION OF NEW BIOMARKERS

Sven Baumann<sup>1</sup>, Georg Martin Fiedler<sup>1</sup>, Uta Ceglarek<sup>1</sup>, Alexander Leichte<sup>1</sup>, Christoph Mayer<sup>2</sup>, Michael Stumvoll<sup>2</sup>, Joachim Thiery<sup>1</sup>. <sup>1</sup>University Hospital Leipzig, Institute of Laboratory Medicine, Clinical Chemistry and Molecular Diagnostics, Leipzig, Saxony, Germany; <sup>2</sup>University Leipzig, Department of Internal Medicine III, Leipzig, Saxony, Germany

**Introduction and Aims:** Proteomic investigations of human urine samples offer tremendous potential for increasing knowledge concerning kidney physiology, prognosis and the early diagnosis of renal diseases. The detection and identification of new biomarkers from urine would allow a monitoring of renal diseases which could improve the therapeutic response and enable one step towards a personalized patient therapy. However, proteome analysis of biological samples requires pre-analytical investigations and the standardization of sample pre-treatment to minimize systematic biases. The aim of our study was to establish the magnetic bead-based sample preparation (MB) combined with Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry (MALDI-TOF MS) for the analysis of human urine samples and to validate a standardized sampling-, processing-, and storage procedure.

**Methods:** We used ClinProt magnetic beads (Bruker Daltonics, Germany) with different surface functionalities (MB-HIC C8, MB-WCX, and MB-IMAC Cu) for sample purification and proteome profiling of human urine specimens by MALDI-TOF MS. We studied the effects on quality and reproducibility of proteome analysis depending on different storage conditions and -periods and various freeze-thaw cycles. Possible negative effects caused by blood contaminations, bacteria or the excess of salts were investigated. Likewise the comparison of first void- and midstream urine as well as first- and second morning urine was of interest. Depending on subject specific clinical data e.g. creatinine- or protein concentration, and pH, we wanted to clarify the necessity and practicability of normalization of human urine samples.

**Results:** MB purification and processing of human urine samples showed a very good within- (CV's 1-15%) and between-day (CV's 2-18%) reproducibility. The proteome profiles showed time- and temperature-dependent dynamic changes. One-time frozen specimens showed higher stability against elevated storage temperature compared to native samples. Ion suppression effects caused by blood contamination could be observed. An excess of salts had no negative effect on urine proteome pattern. The normalization of pH before sample processing is necessary. The adjustment of the creatinine concentration did not decrease the individual variability but exert loss of mass signals due to sample dilution.

**Conclusions:** Clinical proteomics of human urine specimens using MB sample purification in combination with MALDI-TOF MS is a promising tool for the detection of disease related biomarkers. The application of a standardized pre-analytical sampling and storage procedure lowers the sample intrinsic variability and is a basic requirement for a valid biomarker profiling. Currently, a large-scale epidemiological study with human urine of patients suffering from Diabetes Mellitus Type II and the identification of possible disease related biomarkers is under way.

#### MP181 THE DYNAMICS OF URINARY N-ACETYL BETA D-GLUCOSAMINIDASE UNDER TREATMENT WITH MELOXICAM AS AN EXPRESSION OF TUBULAR INJURY IN PRIMARY GLOMERULAR NEPHROPATHIES

Gheorghe Gluhovschi<sup>1</sup>, Silvia Velciov<sup>1</sup>, Adriana Kaycsa<sup>2</sup>, Virginia Trandafirescu<sup>1</sup>, Adalbert Schiller<sup>1</sup>, Ligia Petrica<sup>1</sup>, Gheorghe Bozdog<sup>1</sup>, Cristina Gluhovschi<sup>1</sup>, Flaviu Bob<sup>1</sup>, Corina Vernic<sup>3</sup>, Calin Muntean<sup>3</sup>. <sup>1</sup>Nephrology, U of Med, Timisoara, Romania; <sup>2</sup>Biochemistry, U of Med, Timisoara, Romania; <sup>3</sup>Biostatistics, U of Med, Timisoara, Romania

**Introduction and Aims:** Chronic glomerular nephropathies (CGN) exhibit, aside from glomerular lesions, also tubulointerstitial lesions, which can play a prominent role in their progression. N-Acetyl Beta D-Glucosaminidase (NAG), an enzyme released into the urine, is indicative of

tubular lesions and KDOQI suggests that urinary NAG may also identify a subset of glomerular patients at greater risk of GFR decline. Nonsteroidal anti-inflammatory drugs (NSAIDs) like Meloxicam have both anti-proteinuric and anti-inflammatory effects, being used in the treatment of CGN. The aim of the present paper has been the study of the anti-proteinuric effect, alongside the dynamics of urinary NAG elimination under treatment with Meloxicam, in order to gauge the effects of the latter on tubular lesions during CGN.

**Methods:** Eighteen patients (pts) with CGN have been enrolled into the study, (17 with primary CGN, 1 with CGN secondary to hepatitis B); mean age:  $37.64 \pm 10.69$ ; 5(28%) M, 13(72%) F. All pts underwent treatment with Meloxicam 15mg/day. Eight apparently healthy persons served as controls. Urinary NAG determination was performed by means of the colorimetric method, using kits provided by Roche. Results are expressed as U/g Creatinine. Specimens have been collected before starting Meloxicam therapy, and at 7 and at 30 days thereafter. Renal biopsy was performed in 12 pts. Six out of 18 pts (33.33%) had serum Creatinine levels above 1.3mg%, with values in this subgroup ranging between 1.5 and 3mg%. Arterial hypertension was present in 50% of the pts. The nephrotic syndrome was also present in 50% of the pts.

**Results:** Urinary NAG in CGN pts before the beginning of treatment with Meloxicam had an average value of  $13.20 \pm 18.70$  U/g, not significantly different from the value in controls:  $1.72 \pm 0.85$  U/g;  $p=0.09$  (Wilcoxon). After 7 days of treatment, however, the urinary release of NAG had an average value of  $10.20 \pm 10.40$  U/g;  $p=0.03$  as compared to controls, and after 30 days of treatment the urinary release of NAG had an average value of  $6.82 \pm 4.39$  U/g;  $p=0.003$  as compared to controls. Proteinuria in the group under study decreased from  $2.95 \pm 1.79$  g/24h before onset of therapy to an average of  $1.43 \pm 0.85$  g/24h after 30 days of treatment;  $p=0.002$ . In pts with focal and segmental glomerulosclerosis and in pts with membranoproliferative lesions urinary release of NAG under treatment with Meloxicam was adversely influenced. Urinary release of NAG declined in CGN pts with minimal change lesions and with mesangial proliferative lesions. Across the CGN group, serum Cr rose in 2 pts, in one of them transiently.

**Conclusions:** Meloxicam, an NSAID acting at both Cyclooxygenase 1 and Cyclooxygenase 2, despite its favourable effect on proteinuria; has to be closely monitored for urinary release of NAG, as benefits have to be weighed against potential toxicity and may prompt for discontinuation after short-term administration.

#### MP182 REAL TIME ULTRASONOGRAPHIC PERCUTANEOUS NATIVE KIDNEY BIOPSY: ADEQUACY AND COMPLICATION RATE USING A MATHEMATICAL FORMULA TO CALCULATE THE OPTIMUM NEEDLE TIP DEPTH

Antonio Pasquariello, Maurizio Innocenti, Valentina Batini, Nadia Sami, Giovanna Pasquariello, Francesca Caprio, Costantino Ricci, Sara Beati, Stefano Rindi. *Divisione Nefrologica, Azienda Ospedaliera Pisana, Pisa, Italy*

**Introduction and Aims:** Percutaneous kidney biopsy is an essential tool of investigation in nephrology. Notwithstanding the results reached in safety and efficacy it's not risk free and most series report a number of inadequate specimens ranging from 2,1 to 4,5%. To reduce the biopsy-related complications rate under real-time ultrasonographic control, and to increase the adequacy rate of renal samples for histopathological diagnosis, we have set up a mathematical calculation to ascertain the effective depth of biopsy needle tip to obtain tissue cores useful for diagnosis.

**Methods:** In 2005, we performed percutaneous native kidney biopsy on 51 consecutive patients (23 males, 28 females) aging from 21 to 73 years, using the 14 gauge automatic spring-loaded gun under continuous ultrasound control, shooting the bottom exactly at a depth calculated by a mathematical formula before starting the procedure. We considered optimum sample the specimen constituted by cortical renal tissue with adherent capsule and a sufficient number of glomeruli (usually not less than 10). Our mathematical rule: body weight (B W) expressed in hectograms divided by height (H) expressed in centimetres less 0,5 (BW: H - 0,5), is based on two physical variables of subjects, and the result provides the theoretic calculation of the optimum needle tip depth expressed in centimetres. For example the

theoretic optimum depth for performing percutaneous native renal biopsy in a patient with a body weight of 900 hct (90 kg) and tall 180 cm is:  $900: 180 - 0,5 = 4,5$  cm.

**Results:** All 51 specimens (100% renal tissue) proved to be adequate for diagnosis with a mean of 31 glomeruli (range: 19-80 glomeruli). No patient experienced gross hematuria nor major complications. Only two subjects suffered from slight flank pain, due to a small subcapsular hematoma requiring no treatment.

**Conclusions:** We believe that the utilization of this simple math formula in percutaneous native kidney biopsy could represent an useful tool to reduce biopsy-related complications and the diagnostically unuseful samples rate.

#### MP183 RENAL CORTICAL NECROSIS: A SINGLE CENTRE EXPERIENCE OF 22 YEARS FROM EASTERN INDIA

Jai Prakash, Rubina Vohra, Imtiyaz Ahmad Wani, Srinivas Murthy, Kamalakar Tripathi, Laxmikant Pandey, Usha, Ramachandran Raja. *Nephrology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh, India; Pathology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh, India; Obstetrics and Gynecology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh, India*

**Introduction and Aims:** Renal cortical necrosis (RCN) accounts for only 2% of all cases of acute renal failure (ARF) in developed nations; in contrast to its incidence ranging from 3.8% to 7.1% in patients dialysed for ARF in developing countries. The present study describes clinical spectrum of RCN and its outcome in patients with ARF in eastern India over a period of 22 years; July 1984 to December 2005.

**Methods:** Patients with ARF suspected to have cortical necrosis on clinical grounds underwent percutaneous renal biopsy. Patients showing cortical necrosis on histology were included in present study. Diffuse and patchy cortical necrosis were classified based on standard histological criteria.

**Results:** We noted RCN in 3.12% of all (57/1822) cases of ARF of diverse etiology during the study period. Obstetric and non-obstetric causes were responsible for RCN in 32 (56.2%) and 25 (43.8%) cases respectively. Diffuse cortical necrosis was the dominant lesion in 41 (71.9%) patients and patchy cortical necrosis seen in remaining 16 (28%) patients. The overall incidence of RCN in obstetrical ARF was 15.2%; the incidence being higher (11.9%) in postabortal group in comparison to 3.3% in late pregnancy. RCN complicated puerperal sepsis and abruptio placenta in late pregnancy, while septic abortion was the sole cause of RCN in early pregnancy. Hemolytic uremic syndrome (HUS) was the major (31.5%) cause of RCN in non-obstetrical group and miscellaneous factors were responsible in 7 (12.3%) patients. The HUS was related to diarrhoea (D+HUS) in 14 and no diarrhoea (D-HUS) prodrome in 4 patients. The disease had a fatal prognosis in 30 (52.6%) patients; mortality was due to uremic complications and infections in majority of patients during acute phase of illness. Partial recovery of renal function was noted in 20 (17.5%) and 17 (29.8%) patients had progressed to ESRD. The incidence of renal cortical necrosis decreased from 6.7% in 1984-1994 to 1.6% in 1995-2005 of the total ARF cases. Renal cortical necrosis following obstetrical complications also showed a declining trend; 4.7% in 1990s to 0.54% in 2000s, of the total number of ARF cases.

**Conclusions:** In summary, RCN is an important cause of ARF in developing countries with decreasing trend in recent years. This improvement was mainly due to declining incidence and severity of RCN in pregnancy related acute renal failure.

#### MP184 A NEW EQUATION FOR ESTIMATING RENAL FUNCTION USING AGE, BODY WEIGHT AND SERUM CREATININE

Giovambattista Virga<sup>1</sup>, Flavio Gaspari<sup>2</sup>, Karl Thomaseth<sup>3</sup>, Marilena Cara<sup>1</sup>, Stefania Mastro Simone<sup>1</sup>. <sup>1</sup>Nephrology and Dialysis Unit, Provincial Hospital, Camposampiero, Padova, Italy; <sup>2</sup>Mario Negri Institute for Pharmacological Research, Bergamo, Italy; <sup>3</sup>Institute of Systems Science and Biomedical Engineering, LADSEB-CNR, Padova, Italy

**Introduction and Aims:** Many formulas have been developed to estimate glomerular filtration rate (GFR).

The aim of our study was to propose a new, more reliable equation.

**Methods:** The study considered 530 subjects (training sample) in developing the new equation:

creatinine clearance (CrCL) =  $\{[69.4 - (0.59 \times \text{age}) + (0.79 \times \text{BW})]/\text{sCr}\} - 3.0$  for males and  $\{[57.3 - (0.37 \times \text{age}) + (0.51 \times \text{BW})]/\text{sCr}\} - 2.9$  for females.

A 229-patient renal failure validation sample, assessed using iohexol CL, was considered to compare the C-G and MDRD formulas with the new equation for estimating GFR.

**Results:** The mean % error in GFR estimated by the new equation ( $+2.3 \pm 28.3\%$ ) was better than with the C-G and MDRD formulas ( $+5.2 \pm 30.1\%$  and  $-11.4 \pm 25.9\%$ , respectively,  $p < 0.0005$ ), and so was the mean absolute % error, bordering on statistical significance ( $19.8 \pm 20.3$  vs.  $21.1 \pm 22.0$  and  $22.4 \pm 17.3$ ,  $p = 0.08$ ). The precision was also better (RMSE = 7.89 vs. 8.02 and 9.13). The Bland-Altman test: lack of GFR overestimation trend (CrCL-based equation). Computer simulations: power to correct biases of the C-G formula (GFR overestimation in the young, females, and overweight) and MDRD formula (underestimation in young people and females).

**Conclusions:** The new equation appears to be more suitable for GFR estimation than the C-G and MDRD formulas, particularly for females.

### MP185 EFFECT OF CYCLOOXYGENASE 2 SPECIFIC INHIBITION ON RENAL SODIUM AND WATER EXCRETION IN ELDERLY SUBJECTS WITH CHRONIC RENAL IMPAIRMENT

Miroslava Horackova, Otto Schuck, Komers Radko, Teplan Vladimir, Stollova Milena, Charvat Jiri, Kvapil Milan. *Department of Internal Medicine, 2nd Medical Faculty of Charles University, Prague, Czech Republic; Department of Nephrology, Institut for Clinical and Experimental Medicine, Prague, Czech Republic; Department of Diabetology, Institut for Clinical and Experimental Medicine, Prague, Czech Republic; Department of Nephrology, Institute for Clinical and Experimental Medicine, Prague, Czech Republic; Department of Nephrology, Institute for Clinical and Experimental Medicine, Prague, Czech Republic; Department of Internal Medicine, 2nd Medical Faculty of Charles University, Prague, Czech Republic; Department of Internal Medicine, 2nd Medical Faculty of Charles University, Prague, Czech Republic*

**Introduction and Aims:** Elderly patients suffering from nociceptive pain is the target population for painkilling drugs and the most susceptible to NSAIDs nephrotoxicity. Aim of our study was to evaluate COX-2 inhibition effect on renal water and sodium excretion in elderly patients suffering from renal impairment due to chronic analgesic and (or) vascular nephropathy. Study was performed partly under well-balanced conditions of water and sodium metabolism, partly under conditions of sub maximal water load.

**Methods:** Ten patients (average age 67 years, range 53-80) in stage 3 of GFR impairment (K/DOQI classification) were given 25 mg rofecoxib daily for 7 consecutive days under controlled salt and fluid intake. The effect of rofecoxib on GFR, 24h urinary excretion of prostaglandin PGE<sub>2</sub> and PGF<sub>2α</sub>, electrolyte and osmotic active solutes (OSM) was evaluated. Fractional excretion (FE) of sodium (FE<sub>Na</sub>), potassium (FE<sub>K</sub>), chloride (FE<sub>Cl</sub>) and FE<sub>OSM</sub> partly based on 24-h urine collection and creatinine clearance, partly under conditions of sub maximal water load and inulin clearance, moreover FE of water and solute free water were calculated. Basal and stimulated plasma renin activity (PRA) and plasma aldosteron (P<sub>ALDO</sub>) were examined. All parameters were evaluated before and at the end of 7-days rofecoxib treatment.

**Results:** Rofecoxib treatment did not significantly change GFR and plasma concentrations of Na, K, Cl, and OSM. However, 24-h urinary excretion of Na, OSM and FE<sub>Na</sub>, FE<sub>Cl</sub> and FE<sub>OSM</sub> increased significantly after rofecoxib administration ( $p = 0.05$  and  $p = 0.04$  and  $p = 0.02$  and  $p = 0.04$  and  $p = 0.03$ , respectively), but renal water and OSM excretion did not change significantly under conditions of water load. PGE<sub>2</sub> and PGF<sub>2α</sub> decreased after rofecoxib treatment ( $p = 0.059$  and  $p = 0.024$ , respectively).

**Conclusions:** Short-term rofecoxib administration was (under above mentioned conditions) associated with significant decrease of renal excretion of PGF<sub>2α</sub> and boundary decrease of PGE<sub>2</sub>. Rofecoxib increased renal sodium excretion significantly, without changing of GFR and water excretion. (Our study was performed following the Helsinki Declaration and an informed consent was obtained from each patient in 2003 before removal of rofecoxib out of pharmaceutical market).

### MP186 THE CLINICAL SIGNIFICANCE OF SERUM AND URINARY NEOPTERIN LEVELS IN SEVERAL RENAL DISEASES

Hyang Kim, Hyun Young Lhee, Kyu Beck Lee. *Department of Internal Medicine, Division of Nephrology, Sungkyunkwan University School of Medicine, Kangbuk Samsung Hospital, Seoul, South Korea*

**Introduction and Aims:** Neopterin is a pyrazino-pyrimidine compound, and is known to be a marker associated with cell-mediated immunity in various diseases. The purpose of our study was to determine whether serum and urine neopterin levels were elevated in some renal diseases, including nephrotic syndrome (NS), chronic renal failure (CRF), and end-stage renal disease (ESRD). We also assessed correlations between serum and urinary neopterin levels and some of the clinical parameters.

**Methods:** The study group was enrolled 91 patients (biopsy-proven 19 NS, 8 CRF with GFR of 10-60 mL/min, and 64 ESRD with undergoing maintenance hemodialysis). Serum and urinary neopterin levels were measured by radioimmune assay (ICN Biomedicals, Costa Mesa, California, USA). Urinary neopterin levels are expressed per mole of creatinine so as to standardize differences in renal function vs neopterin excretion.

**Results:** Serum and urinary neopterin levels were elevated in patients with CRF and ESRD, as compared to controls. Serum neopterin levels showed positive correlation with age, BUN and creatinine, and inverse correlation with WBC, hemoglobin, hematocrit, albumin and TIBC. Urine neopterin levels exhibited positive correlation with age and creatinine, and inverse correlation with WBC, hemoglobin, hematocrit, BUN and albumin.

	Serum neopterin			Urine neopterin			
	r	p		r	p		
Age	0.251	0.018	S	0.434	0.007	S	
WBC	-0.243	0.024	S	-0.409	0.013	S	
Hemoglobin	-0.279	0.009	S	-0.646	<0.0001	S	
Hematocrit	-0.244	0.023	S	-0.660	<0.0001	S	
BUN	0.405	<0.0001	S	-0.611	<0.0001	S	
Creatinine	0.562	<0.0001	S	Serum creatinine	0.522	0.001	S
Total protein	0.104	0.366	NS	total serum protein	0.104	0.366	NS
Albumin	-0.123	0.261	S	Serum albumin	-0.607	<0.0001	S
Triglyceride	-0.068	0.535	NS	Triglyceride	-0.235	0.181	NS
Iron	-0.100	0.434	NS				
TIBC	-0.394	0.001	S				

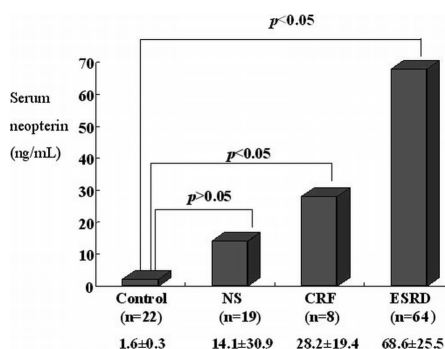


Fig. 1. Levels of serum neopterin in patient population.

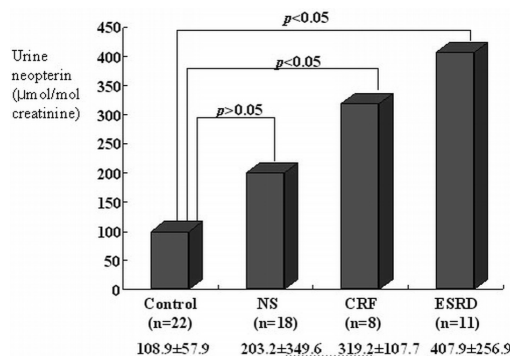


Fig. 2. Levels of urine neopterin in patient population.

**Conclusions:** We suggest that serum and urinary neopterin levels may be useful marker for predicting disease activity and prognosis in some patients with renal disease.

### MP187 RISK OF FRACTURE AMONG DIALYSIS AND RENAL TRANSPLANT RECIPIENTS

Simon Roe<sup>1</sup>, Christine Porter<sup>1</sup>, Laila Tata<sup>2</sup>, Richard Hubbard<sup>2</sup>, Michael Cassidy<sup>1</sup>. <sup>1</sup>Renal and Transplant Unit, Nottingham University Hospitals, Nottingham, United Kingdom; <sup>2</sup>Department of Public Health and Epidemiology, Nottingham University Hospitals, Nottingham, United Kingdom

**Introduction and Aims:** Patients with chronic kidney disease have multiple risk factors for reduced bone mineral density. Previous studies in the United States have shown increased fracture rates for dialysis and renal transplant recipients. There is limited data on fracture rates in European patients with chronic kidney disease or receiving renal replacement therapies. The aim of this study was to determine fracture rates and risk factors for fracture in a our centre.

**Methods:** A cohort of 653 patients receiving renal replacement therapy (RRT) were recruited. Using age and gender frequency matching 966 patients with CKD and 842 patients from General Practices were identified as controls. Demographic data, medical and fracture history were collected using a self-completed questionnaire. Fracture rates and rate ratios were calculated.

**Results:** Patients on dialysis and renal transplant recipients were at an increased risk of fracture (rate ratio (RR)1.64) compared to the general population (see table). Fracture risk in CKD patients was not different compared to the general population (RR 1.00). Significant risk factors for fracture ( $p < 0.01$ ) included male gender, current smoking and use of corticosteroids. Body mass index and diabetes were not associated with fracture. After controlling for gender, age and corticosteroid use RR for haemodialysis and peritoneal dialysis were 2.5 and 1.74 respectively. Patients who received a renal transplant were at approximately a three-fold increased risk of fracture, this risk persisted even if they subsequently returned to dialysis.

	Number of fractures	Fracture rate per 10,000 person years	Rate Ratio (95% CI)
General population	284	81.4	reference
Chronic kidney disease	307	81.7	1.00 (0.88-1.18)
RRT Cohort	321	133.7	1.64 (1.40-1.93)
Haemodialysis	18	252.5	2.50 (1.47-4.25)
Peritoneal dialysis	10	159.7	1.74 (0.88-3.41)
Renal transplant	84	310.4	3.07 (1.84-5.11)

**Conclusions:** Patients receiving renal replacement therapy have higher rates of fracture compared to the general population and patients with chronic kidney disease. The highest risk is among renal transplant recipients. Evidence based strategies to reduce fracture risk in this high risk population are needed.

### MP188 RASi THERAPY IN THE RENAL HAEMODYNAMIC IN THE COURSE OF PROTEINURIC CHRONIC NEPHROPATHY

Giacomina Loriga, Giampaolo Vidili, Giuseppe Delitala, Andrea E. Satta. Internal Medicine, Sassari University, Sassari, Italy

**Introduction and Aims:** Angiotensin II (Ang II) play a key role in the initiation and progression of renal damage, that cannot be attributed exclusively to its hemodynamic effect but also to several non hemodynamic mechanisms such as growth stimulation, fibrogenesis and impairment of endothelial function. Treatment with Renin Angiotensin System inhibitors (RASi), that decreases proteinuria, is reno-protective. Angiotensin Converting Enzyme inhibitors (ACEi) decrease glomerular hyperfiltration and block breakdown of bradykinin inducing vasodilatation. Ang II receptor antagonists (ARA), appear to be equally efficacious as ACEi. The dual block of the renin-angiotensin-aldosterone cascade, may ameliorate renal damage and reduce the progression of chronic kidney disease by a combination of hemodynamic effect, antagonism of profibrotic effect and urinary protein reduction.

Duplex Doppler sonography of renal vasculature is a non invasive evaluation technique, performed to assess the intrarenal haemodynamic in patients with kidney disease. The pulsatility index (PI) and the resistive index (RI) may be considered as reliable measurements of down-stream of Renal Vascular Resistances (RVR) and correlate to Ang II activity. This points to the possibility that the indices may be used to monitor the renal disease, above all during the treatment with RASi, in which the block of the Ang II they could influence the tone of renal vasculature. For against the answer to these drugs it could be related to the RAS hyperactivity that in turn can lead to the high RVR.

**Methods:** In order to examine the possible correlation between PI and RI and RAS activity in patients with proteinuric chronic nephropathy, before and after RASi therapy in patients with chronic proteinuric nephropathy, we enrolled 7 patients a two-month *Run-in period* with ACEi (Benazepril 10 or 20 mg/day) for one month and ACEi plus ARA (Valsartan 80 or 160 mg/day) for one further month. Complete evaluation were performed at baseline and at the end of the first and the second month of therapy.

**Results:** ACEi therapy alone or in combination with ARA is similarly effective in ACE plasma level suppression (see the table). It is associated with overproduction of Plasma Renin Activity (PRA) and Active Renin (AR), without increase of plasma Aldosterone. After one month of ACEi therapy, PI and RI decrease and don't change during the second month of ACEi/ARA combined therapy.

	Baseline 0 month	ACEi 1 month	ACEi/ARA 2 months
Proteinuria (g/24h)	2.0	1.9	1.5
PRA (ng/ml/h)	1.4	5.5	4.4
AR (pg/ml)	9.9	53.2	82.2
ACE (U/l)	14.6	0.9	1.3
Aldosterone (pg/ml)	77.3	59.1	89.4
RI	0.65	0.62	0.62
PI	1.13	1.07	1.09

**Conclusions:** Thus, the first small decline of proteinuria seem to be related to the haemodynamic effect of ACEi in glomerular vasculature, confirmed also by the correlation analysis between percentual variation of RI and proteinuria. The additive decline in proteinuria during the ACEi/ARA combined therapy, without further reduction in RVR, suggest the presence of non-haemodynamic component, different from the known vasodilatation, in the anti-proteinuric effect, and therefore in reno-protection, provided by RAS inhibitors therapy.

### MP189 ACUTE RENAL FAILURE FOLLOWING BONE MARROW TRANSPLANTATION IN IRAN – FREQUENCY, RISK FACTOR, OUTCOME

Fereshteh Saddadi<sup>1</sup>, Iraj Najafi<sup>1</sup>, Monirsadat Hakemi<sup>1</sup>, Babak Bahar<sup>2</sup>, Kianoosh Falaknazi<sup>1</sup>, Mohammad Reza Ganji<sup>1</sup>. <sup>1</sup>Nephrology Department, Dr Shariati Hospital, Tehran, Iran; <sup>2</sup>BMT Department, Dr Shariati Hospital, Tehran, Iran

**Introduction and Aims:** Blood and marrow transplantation (BMT) is a major treatment modality for malignant and hematologic disorders. This procedure is associated with a high risk of treatment related morbidity and mortality. Many factors, such as therapeutic agents, irradiation, Graft versus host disease (GVHD), can cause acute renal failure after BMT. Bone marrow Transplantation Conditioning Therapy in Iran is based on drugs, such as busulfan and cyclophosphamide therapy, without radiation therapy, so the etiology of acute renal failure is not due to radiation nephropathy in Iran BMT research Center. The aim of this study was to examine the frequency, risk factors and associated mortality of ARF requiring dialysis.

**Methods:** To assess the frequency, risk factors, and outcome of acute renal failure (ARF) following BMT, a prospective analysis of 378 patients was undertaken in the BMT research center of Dr.Shariati hospital in Tehran, Iran. The conditioning regimens were based on drugs busulphan and cyclophosphamide without total body irradiation, and patients received acute GVHD prophylaxis consisting of cyclosporine (Cs), methylprednisolone (MP), or Cs, MP, and Methotrexate (Mtx). The patients were assessed for developing ARF, GVHD, Drug Toxicity, veno-occlusive disease (VOD).

**Results:** Acute Renal Failure was diagnosed in 142 patients (37.6%) and occurred in 80% within the first month. The main clinical cause were Cs

nephrotoxicity(46%), nephrotoxicity of aminoglycoside and amphotericine B(18%), graft versus host disease (GVHD), and hemolytic uremic syndrome(HUS) 36%.the frequency was higher in allogenic BMT (42.1%) than in autologous BMT (22.1%). Risk factors related to the development of ARF were age older than 16 years  $P<0.001$ , and allograft BMT  $P<0.0001$ ,Cs for prophylaxis of GVHD  $P<0.0001$ .Underlying disease, sepsis, conditioning therapy, and sex were not associated with ARF ( $P$ =nonsignificant). None of the patients required hemodialysis and the overall mortality from ARF was zero percent.

**Conclusions:** It is concluded that ARF is a common complication mainly in allogenic BMT and carries a good prognosis in this center in Tehran, Iran. The age, BMT type, Cs prophylaxis were risk factor for ARF following BMT.The older age and allograft donor transplants use more GVHD prophylaxis regimens, and they are also associated with higher rate of fungal infections, which are usually treated with nephrotoxic drugs.Strategies to control the incidence and severity GVHD, will likely decrease the renal toxicities.

### MP190 AN UNUSUAL CASE OF INTERMITTENT POST-RENAL PROTEINURIA

Georges Halabi<sup>1</sup>, Hugues Henry<sup>2</sup>, Daniel Teta<sup>1</sup>, Bruno Vogt<sup>1</sup>, Michel Burnier<sup>1</sup>. <sup>1</sup>Nephrology, Lausanne University Hospital, Lausanne, Switzerland; <sup>2</sup>Central Clinical Chemistry Laboratory, Lausanne University Hospital, Lausanne, Switzerland

**Introduction and Aims:** A 64-year-old man was referred for evaluation of a renal insufficiency associated with a nephrotic syndrome. Laboratory studies showed erythrocyte sedimentation rate at 120 mm/h. Serum creatinine 117 mmol/l and serum albumin 22g/L. Urinalysis showed proteinuria 11 g/d and glomerular erythrocyturia. ANA were positive 1:640. Renal biopsy revealed focal and segmental endo and extracapillary proliferation. Patient was treated with oral cyclophosphamide (CYC) for 12 weeks (2mg/kg/d) and prednison (P) achieving partial remission. 11 months later, he was treated again during 8 weeks with oral CYC and P for a first proteinuric flare. During the follow up the patient fulfilled criteria for LED, he developed arthritis and anti-dsDNA antibodies become positive The second proteinuric flare was treated with ciclosporine achieving a complete remission of proteinuria. Ciclosporine was switched to MMF. One year after achieving total remission, intermittent proteinuria was observed. The magnitude of this proteinuria (up to 4 g/day) was in discrepancy with the urinary sticks showing a low albumin excretion.

**Methods:** Gel agarose electrophoresis of urine proteins showed an uncommon pattern of aggregating proteins. In order to identify these proteins, we performed their analysis using a mass spectrometry approach. Urinary proteins (10 µg) were separated by SDS-PAGE (NuPAGE 12%, Invitrogen). Molecular weights were calculated using protein standards as reference (Invitrogen). The protein bands were excised from the gels. Individual spots were washed, reduced and alkylated with iodoacetamide before in-gel trypsin digestion. The fragments were analyzed by MALDI-TOF mass spectrometry.

**Results:** 9 protein bands from the urine of the patient respectively of 66-, 51-, 49-,36-, 33-, 29-, 25-, 21- and 18 kDa were analyzed and trypsinized. The resulting fragments allowed us to identify semenogelin-1 (SEM1), and semenogelin-2 (SEM2) as the main source of proteins in the urine of the patient. SEM1 and SEM2 are the predominant proteins in the semen. Eight

fragments of SEM1 and SEM2 of 51-, 49-, 36-, 33-, 29-, 25-, 21- and 18 kDa were separated by SDS-PAGE. Four of these peptides of 49-, 33-, 29- and 18 kDa have their masses identical as those obtained from the cleavage of SEM1 by human kallikrein hK3 (PSA). These observations indicated that the post-translational modifications of SEM1 found in the urine of the patient are similar to those found in a normal sperm.

**Conclusions:** To our knowledge, this is the first demonstration of a post-renal proteinuria in a patient with lupus nephritis in remission. This proteinuria was a real confounding factor in the management of this patient. Whether this proteinuria is specific to the disease or may occur in other clinical settings is so far not known.

### MP191 HIGH LEVELS OF ANTIBIOTIC RESISTANCE IN PATHOGENS CAUSING URINARY TRACT INFECTIONS IN INDIA

Vishal Sagar<sup>1</sup>, Atul Kothari<sup>2</sup>. <sup>1</sup>Department of Nephrology, <sup>2</sup>Department of Microbiology, Max Healthcare, New Delhi, India

**Introduction and Aims:** Empiric therapy of urinary tract infections is determined by the sensitivity patterns of the organisms grown in urine cultures in a patient population. Very little data is available about the prevalence and antibiotic sensitivities of uropathogens in India. The purpose of this study is to identify the most common pathogens associated with clinical urinary tract infections in India and to determine their antibiotic sensitivities. This will help us establish guidelines on empiric antibiotic usage in patients with urinary tract infections in India.

**Methods:** We analyzed 531 consecutive positive urine cultures taken from five primary and secondary care centers from June to December 2005 in New Delhi, India. All the patients had clinical evidence of a urinary tract infection as determined by the treating physician. Only out-patient samples were considered. Patients who required hospitalization for treatment of their infection were excluded from the study. Sensitivity testing was done for ciprofloxacin, trimethoprim-sulfamethoxazole, amoxicillin, amikacin, nitrofurantoin, piperacillin-tazobactam and meropenem in each isolate.

**Results:** 361/531 (68%) of the isolates were E. Coli. Other gram negative rods included Klebsiella 90/531 (16.9%), Proteus 29/531 (5.5%) and Enterobacter 28/531 (5.3%). Staphylococcus saprophyticus was seen in 15/531 (2.8%) and others in 8/531 (1.5%)

Antibiotic sensitivities on all gram negative rods showed that only 35.8% were sensitive to ciprofloxacin. Sensitivity to trimethoprim-sulfamethoxazole was 30% and to amoxicillin was only 17.8%. 75.5% of the gram negative rods were sensitive to amikacin, 65.7% to nitrofurantoin, 90.2% to piperacillin-tazobactam and 100% to meropenem.

**Conclusions:** An alarming rate of resistance to ciprofloxacin, trimethoprim-sulfamethoxazole and amoxicillin was seen in our population. These antibiotics cannot be recommended for empiric use in urinary tract infections in India.

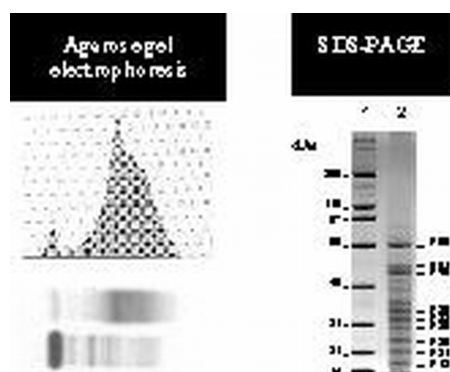
Amikacin and nitrofurantoin have a higher level of sensitivity and can be potentially used for empiric therapy. However, amikacin is given via the parenteral route and is nephrotoxic. Nitrofurantoin is not effective in patients with a low glomerular filtration rate. In patients with renal insufficiency, piperacillin-tazobactam or meropenem would be the most reasonable choices. Unfortunately, both of these drugs are given parenterally and are expensive.

The rampant use of antibiotics in the general population in India would need to be curbed to avoid development of high levels of antibiotic resistance.

### MP192 EXPRESSION OF THE COAGULATION FACTOR VIII IN DIFFERENT TYPES OF HUMAN GLOMERULONEPHRITIS. DOES IT MAKE ANY SENSE?

Glykeria Tsouka<sup>1</sup>, Dimitris Petras<sup>1</sup>, Helen Paraskevaku<sup>2</sup>, Ploumis Pasadakis<sup>3</sup>, John Papadakis<sup>1</sup>, John Kakavas<sup>1</sup>, Efstratios Patsouris<sup>2</sup>. <sup>1</sup>Department of Nephrology, "Hippokratio" General Hospital, Athens, Greece; <sup>2</sup>Department of Pathology, Medical School, National and Kapodistrian University of Athens, Athens, Greece; <sup>3</sup>Department of Nephrology, Medical School, Democritus University of Thrace, Alexandroupolis, Greece

**Introduction and Aims:** The important role of the coagulation system in



the pathogenesis and the progression of glomerulonephritis (GN) has been recognized from in vitro and in vivo studies in animal models. Only a few studies do exist in human renal biopsies, while specific anticoagulant therapy is not usually applied. In order to investigate the role of the coagulation system in human's GN we studied the deposition of coagulation factors in renal biopsies.

**Methods:** In order to estimate the amount of coagulation factors in the renal tissue the immunoperoxidase histochemistry was used in renal biopsies of patients with GN. The intensity of staining in the segment of the glomeruli was scored on a scale from 0 to +++. Glomeruli in which deposition was not different from background were scored 0. Glomeruli with light staining were scored +. Glomeruli with medium staining were ++ and glomeruli with intense staining +++. In this report we are presenting some preliminary results (43 biopsies).

**Results:** Our results are referring to the presence of factor VIII in human renal biopsies in various GN (table 1). In particular in 11 specimens out of 23 renal biopsies of patients with IgA GN the staining of coagulation factor VIII appears to be intense. The same intensity appears in 6 out of 8 renal biopsies of patients with rapidly progressive GN. These findings may suggest an activation of the coagulation system in these types of GN.

Table 1. Intensity of glomeruli deposition of coagulation factor VIII

	IgA GN	Membranous GN	Rapidly progressive GN	Type I membranoproliferate GN	Type IV GN of SLE
Intense (+++)	11	2	6	1	1
Medium (++)	4	3	2	1	0
Light (+)	8	3	0	0	1

**Conclusions:** Our preliminary results are suggesting that we need to emphasize more on the critical participation of the coagulation system in the pathogenesis of human GN. Further evaluation of the intensity of staining in the glomeruli in different types of GN in accordance with the progression of the renal injury is needed.

#### MP193 DIFFERENCES ON THE EVALUATION OF THE HEALTH RELATED QUALITY OF LIFE (HRQOL) BETWEEN DIALYSIS PATIENTS AND THEIR CAREGIVERS (FAMILIAR, NURSES AND PHYSICIANS)

Fernando Alvarez-Ude<sup>1</sup>, Covadonga Valdes<sup>2</sup>, Pablo Rebollo<sup>3</sup>, Carmen Estebanez<sup>1</sup>. <sup>1</sup>Nefrology Unit, Hospital General Hospital General Segovia, Segovia, Spain; <sup>2</sup>Nefrology Unit, Hospital Universitario Central Asturias., Oviedo, Asturias, Spain; <sup>3</sup>Health Outcomes Research Unit, BAP Health Outcomes, Oviedo, Asturias, Spain

**Introduction and Aims:** The aim of this study was to assess the agreement between patients and carers: (family carer-FAM, nurse-NUR and physician-PH) on patients HRQOL.

**Methods:** A sample of 221 patient-family carer pairs stratified by age and gender was randomly selected from 14 dialysis units: 152 hemodialysis and 69 peritoneal dialysis. Patients QoL was evaluated by the patient and FAM, NUR and PH, using both components of the EQ-5D: the five dimensions (Mobility-M, Self-Care-SC, Usual Activities-UA, Pain-P, Anxiety/Depression-AD) and their Tariff (T), and the Visual Analogue Scale (VAS). Patients and FAM answered the SF-36 (physical and mental component summary: PCS, MCS). Physicians scored the comorbidity Index of patients and nurses scored the Barthel Scale (BS) of patients.

**Results:** The correlation coefficients for the VAS of the patients and carers were 0.42 (FAM), 0.49 (NUR) and 0.30 (PH); NUR and PH scored VAS higher than patients did ( $p < 0.01$ ). For the T, the correlation coefficients were 0.66 (FAM), 0.68 (NUR) and 0.57 (PH); FAM scored T lower than patients did ( $p < 0.01$ ). The agreement (Kappa) between the EQ-5D varied between moderate for M (0.56 FAM; 0.55 NUR; 0.47 PH) and for SC (0.48 FAM; 0.50 NUR; 0.42 PH) and low or insignificant for P (0.32 FAM; 0.40 NUR; 0.18 PH) and for AD (0.26 FAM; 0.28 NUR; 0.14 PH). The variables associated to the size of differences found for VAS were: FAM: patient comorbidity (+0.61) and MCS of the FAM (-0.48); NUR: BS (-0.23); PH: age of the physician (-0.41).

**Conclusions:** Agreement between patients and carers for objective dimensions of QOL (M and SC) was therefore moderate, and was low for subjective dimensions (P and AD). Agreement in all the EQ-5D dimensions

was lower for PH than for FAM and NUR, and the variables associated to a greater difference were: a) FAM: higher comorbidity of the patient and worse mental health state of family carer b) NUR: greater degree of dependency of the patient; c) PH: lower age (experience) of the physician.

#### MP194 HEALTH RELATED QUALITY OF LIFE (HRQOL) AND BURDEN OF FAMILY CAREGIVERS OF DIALYSIS PATIENTS

Pablo Rebollo<sup>1</sup>, Covadonga Valdes<sup>2</sup>, Fernando Alvarez-Ude<sup>3</sup>, Carmen Estebanez<sup>3</sup>. <sup>1</sup>Health Outcomes Research Unit, BAP Health Outcomes, Oviedo, Asturias, Spain; <sup>2</sup>Nefrology Unit, Hospital Universitario Central de Asturias, Oviedo, Asturias, Spain; <sup>3</sup>Nefrology Unit, Hospital General Segovia, Segovia

**Introduction and Aims:** To evaluate the HRQoL and burden of family caregivers of dialysis patients, and to analyze which variables were associated to it.

**Methods:** A sample of 221 patient-carer pairs, stratified by age and gender, was randomly selected from 14 dialysis units: 152 patients were on hemodialysis and 69 on peritoneal dialysis. Patients and carers answered the SF-36, obtaining Physical (PCS) and a Mental (MCS) Component Summary scores standardized by age and gender, and the Duke-UNC Functional Social Support (FSS). Carers also answered the Caregiver Burden Interview of Zarit (ZS).

**Results:** Mean PCS and MCS scores of carers were  $48.4 \pm 13.8$  and  $48.0 \pm 11.3$  respectively. Multiple regression analysis showed that the variables associated to lower PCS of the carer were: higher ZS and older patient age ( $R^2 = 0.15$ ;  $p < 0.001$ ). Variables associated to lower MCS were: higher ZS and lower FSS of the carer, and lower MCS of the patient ( $R^2 = 0.29$ ;  $p < 0.001$ ). Variables associated to a higher ZS of carers were: lower FSS and lower PCS and MCS scores of the carer and higher age and lower PCS and MCS scores of the patient ( $R^2 = 0.49$ ;  $p < 0.001$ ). Carers with a MCS  $\leq 42$  points (cutoff point associated with depression) were 28.3% (95% CI = 22.4-34.8). Logistic regression analysis showed that variables associated to having a MCS  $\leq 42$  points were: higher ZS and lower FSS of carer.

**Conclusions:** The HRQoL of caregivers is slightly worse than that of the general population of the same age and gender. Physical health status is more damaged in those caregivers suffering greater burden and caring for older patients, and mental health status is more damaged in those suffering greater burden, feeling lower social support and caring for patients with worse mental health status. The burden experienced by family carers depends on perceived social support, age of patient and physical and mental health status of carer and patient. A significant percentage of carers have depression which is associated to greater burden and lower social support perceived.

#### MP195 FACTORS ASSOCIATED WITH HIGH-SENSITIVE C-REACTIVE PROTEIN (hs-CRP) LEVEL IN 41,630 ADULTS WHO PARTICIPATED IN THE HEALTH-CHECK PROGRAM IN KOREA

Tae Hee Kim<sup>1</sup>, Soon Bae Kim<sup>1</sup>, Hyun Jung Seok<sup>1</sup>, Seong Hoon Jeon<sup>2</sup>, Ki Rhack Kim<sup>2</sup>. <sup>1</sup>Department of Internal Medicine, Asan Medical Center, University of Ulsan, Seoul, South Korea; <sup>2</sup>Health Promotion Center, Asan Medical Center, University of Ulsan, Seoul, South Korea

**Introduction and Aims:** Cardiovascular disease remains the most common cause of morbidity and mortality in patients with end-stage renal disease. Recently, it has become clear that inflammation is an important process in the pathogenesis of atherosclerosis. Up to date, cardiovascular risk factors which are reported to be associated with hs-CRP in the general population includes atherosclerosis, diabetes, hypertension, smoking, age, gender, smoking, body mass index, pulse pressure, triglycerides, HDL-cholesterol and glomerular filtration rate. It is possible that there are some differences in the causes of chronic inflammatory process between Western and Asian. This study was undertaken to evaluate factors associated with circulating hs-CRP in the health-check program participants in Korea.

**Methods:** At 2004, 41,630 adult subjects (M:F=24,364:17,266, age  $47.4 \pm 10.5$  years) who visited Health Promotion Center in Asan Medical Center and enrolled this cross-sectional study. The medical checkup program was

composed of the taking of a full medical history, physical examinations, hs-CRP, liver function tests, glucose, glycosylated hemoglobin, calcium, phosphorus, uric acid, protein, albumin, electrolytes, lipid profile, complete blood count, serological tests such as rheumatoid factor, hepatitis B virus surface antigen carrier, hepatitis C virus antibody, HIV virus, VDRL and Helicobacter pylori antibody, urinalysis, a stool examination, thyroid function tests, a chest roentgenogram, an electrocardiogram, a respiratory function, abdominal ultrasonography and duodenofiberscopy or a fluoroscopic examination of the upper gastrointestinal tract. hs-CRP level was analyzed with clinical characteristics and results of other tests.

**Results:** hs-CRP level was significantly higher in men, smoker and patients with diabetes mellitus, hypertension, ischemic heart disease, fatty liver disease, gastritis and gastric ulcer than in subjects without these diseases. But there was not significant elevation of hs-CRP in patients with inactive hepatitis B virus surface antigen carrier state, hepatitis C virus antibody and Helicobacter pylori antibody. In univariate regression analysis, there were significantly correlated between hs-CRP and each of body mass index (BMI) ( $r = 0.269, p < 0.001$ ), alkaline phosphatase (ALP) ( $r = 0.246, p < 0.001$ ), HDL-cholesterol ( $r = -0.207, p < 0.001$ ), uric acid ( $r = 0.194, p < 0.001$ ), r-glutamyl transferase (r-GT) ( $r = 0.176, p < 0.001$ ), triglyceride ( $r = 0.168, p < 0.001$ ), systolic blood pressure ( $r = 0.166, p < 0.001$ ) and age ( $r = -0.150, p < 0.001$ ). In multivariate regression analysis, ALP ( $r = 0.173, p < 0.001$ ), BMI ( $r = 0.159, p < 0.001$ ) and HDL-cholesterol ( $r = -0.100, p < 0.001$ ) were independent factors correlated with hs-CRP.

**Conclusions:** This result suggests that liver dysfunction as well as cardiovascular disease risk factors were associated with hs-CRP level in the health-check program participants in Korea.

#### MP196 URINARY NAG AS A MARKER OF RENAL INVOLVEMENT IN BETA THALASSEMIA MAJOR

Masoumeh Mohkam, Shahin Shamsian, Atoosa Gharib, Shahin Nariman, Mohammad Taghi Arzani. *Pediatric Nephrology, Shahid Beheshti University, Tehran, Iran; Pediatric Hematology, Shahid Beheshti University, Tehran, Iran; Pediatric Pathology, Shahid Beheshti University, Tehran, Iran*

**Introduction and Aims:** In patients with beta-thalassemia major, the most important cause of mortality and morbidity is organ failure due to iron deposition. Studies of renal involvement in thalassemia syndromes have been varied and few.

The aim of this study is detection of renal dysfunction in major Beta thalassemic patients.

**Methods:** This descriptive study was conducted between Feb. 2004 – Feb. 2005 on all Beta Thalassemia patients attended in out patient clinic of Mofid Hospital. Diagnosis was carried out by standard criteria.

**Results:** 103 beta-thalassemia children with various disease severity were studied. The first fresh morning urine sample was collected and analyzed for sodium, potassium, calcium, creatinine, phosphorus, uric acid, NAG (N-acetyl-beta-D-glucosaminidase) and amino acids. A blood sample from each patient was collected for evaluation of complete blood cell count, fasting blood sugar and serum ferritin, sodium, potassium, creatinine, uric acid, bicarbonate and amino acids. In our study for sampling the method of census was utilized and we used T-test, Chi<sup>2</sup> and Regression analysis (Pearson correlation) for statistic analysis. Mean age of our patients was  $12.5 \pm 5.53$  year, 53.4% were female and remaining were male. Our patients had significantly high levels of urinary NAG ( $13.5 \pm 13$  U/gr) in 35.3% and abnormal FE-Na in 29.4%, abnormal FE-K in 7.8% and abnormal urinary Ca/Cr in 22.5%. Mean age in patients with abnormal urinary NAG was significantly higher than mean age in those who had normal urinary NAG ( $p < 0.001$ ). There was a significant correlation between mean desferoxamine usage and mean transfusion duration in patients with abnormal urinary NAG and those with normal urinary NAG ( $p < 0.002$  and  $p < 0.001$  respectively). We also found a significant correlation between age and FE-Na ( $r = 0.65, P < 0.03$ ). Although there was not a significant correlation between mean serum ferritin level in these two groups ( $p < 0.14$ ). There was a REVERSE CORRELATION between age groups and fractional excretion of uric acid ( $r = -0.2, P = 0.03$ ). There was a significant correlation between blood sugar and age groups ( $r = 0.52, P < 0.001$ ) and U-NAG ( $r = 0.2, P = 0.04$ ).

**Conclusions:** We conclude that renal dysfunction is far from rare in Beta thalassemia and increases with patients' age, and also urinary NAG is one of the most sensitive tests for early diagnosis of renal impairment.

#### MP197 THE EARLY SIGNS OF RENAL DYSFUNCTION IN PATIENTS WITH SYSTOLIC CHRONIC HEART FAILURE AND THEIR RELATIONSHIP WITH CLINICAL STATUS

Elena Resnik, Gennady Gendlin, Gennady Storogakov. *Hospital Therapy No.2, Russian State Medical University, Moscow, Russian Federation*

**Introduction and Aims:** Recent studies have shown the deterioration of prognosis in pts with chronic heart failure (CHF) after development of renal dysfunction. The aim of our study was to reveal early signs of renal dysfunction and their relationship with severity of systolic CHF.

**Methods:** 33 pts (30 male) with systolic CHF were studied. All pts were treated in accordance with contemporary guidelines and hadn't acute decompensation. The pts with primary renal disease, diabetes mellitus, autoimmune and oncological diseases were excluded. The pts were grouped in according to New York Heart Association (NYHA) functional class.

All pts filled up the Kansas City Cardiomyopathy Questionnaire (KCCQ). Echocardiography, duplex ultrasoundgraphy of renal arteries (RA), measurement of serum and urinary level of urea, creatinine, K<sup>+</sup>, Na<sup>+</sup>, Cl<sup>-</sup>, total Ca<sup>2+</sup>, P, uric acid and glucose were performed. Urinary albumin excretion (UAE) was estimated by immunoturbidimetric (ITDA) and immunoenzymatic assays (IEA). The estimated glomerular filtration rate (GFR) was calculated using the Cockcroft-Gault equation.

**Results:** Left ventricular ejection fraction (LVEF) was 28.8 (23.9–30.6)%. Microalbuminuria was revealed in 41.9% (IEA) or in 67.7% (ITDA). 82.8% of pts had normal serum creatinine, 17.2% had elevated serum creatinine (but less than 132 mM in male, 123 mM in female). GFR was  $>90$  ml/min/1.73 m<sup>2</sup> in 32.3%, 60-89 in 57.4% and 30-59 in 10.3% of pts.

There weren't significant differences in echocardiography parameters such as LVEF, cardiac output (CO<sub>LV</sub>) and stroke index of LV (SI<sub>LV</sub>) in patients with I-II and III-IV NYHA class. However renal hemodynamic parameters such as index of blood volume entering into the RA during single cardiac cycle (SI<sub>RA</sub>) and renal arteries end diastolic velocity (Ved<sub>RA</sub>) reflecting basal renal blood flow were significantly higher in the I-II NYHA class pts in comparison with the III-IV NYHA class pts.

	I-II NYHA class (n=14)	III-IV NYHA class (n=19)	p
SI <sub>RA</sub> right, ml/m <sup>2</sup>	4.8 (2.6–5.1)	2.6 (1.6–3.2)	0.01
SI <sub>RA</sub> left, ml/m <sup>2</sup>	3.8 (2.6–5.3)	2.4 (1.7–3.8)	0.03
Ved <sub>RA</sub> right, m/s	0.18 (0.16–0.24)	0.13 (0.11–0.18)	0.04
Ved <sub>RA</sub> left, m/s	0.16 (0.15–0.23)	0.12 (0.10–0.16)	0.02

NYHA class didn't correlate with LVEF and CO<sub>LV</sub> and correlated with SI<sub>LV</sub> ( $r = -0.37, p = 0.049$ ) and SI<sub>RA</sub> ( $r = -0.59$  and  $-0.63, p = 0.002$  and  $0.001$  for right and left RA respectively). Similar relation was revealed for KCCQ severity of dyspnoea and oedema. There wasn't correlation between SI<sub>LV</sub> and SI<sub>RA</sub>. KCCQ summary score also correlated with SI<sub>RA</sub> ( $r = 0.46$  and  $0.49, p = 0.023$  and  $0.014$  for right and left RA respectively), Ved<sub>RA</sub> ( $r = 0.43$  and  $0.54, p = 0.023$  and  $0.002$  for right and left RA respectively), serum creatinine ( $r = -0.37, p = 0.045$ ), UAE (IEA) ( $r = -0.37, p = 0.046$ ) and albumin/creatinine ratio (ITDA) ( $r = -0.53, p = 0.002$ ).

**Conclusions:** Up to 67.7% of patients with systolic CHF without primary renal disease had renal dysfunction. The clinical severity of systolic CHF correlated with renal hemodynamic parameters and manifestations of renal dysfunction more than with echocardiography parameters.

#### MP198 IDIOPATHIC RETROPERITONEAL FIBROSIS: A CLINICO-PATHOLOGICAL AND IMMUNOHISTOCHEMICAL ANALYSIS OF 24 CASES

Augusto Vaglio<sup>1</sup>, Domenico Corradi<sup>2</sup>, Roberta Maestri<sup>2</sup>, Paolo Greco<sup>1</sup>, Silvia Bosio<sup>2</sup>, Alessandra Palmisano<sup>1</sup>, Lucio Manenti<sup>3</sup>, Stefania Ferretti<sup>4</sup>, Gabriella Moroni<sup>5</sup>, Angelo Paolo Dei Tos<sup>6</sup>, Carlo Buzio<sup>1</sup>. <sup>1</sup>Clinical Medicine, Nephrology and Health Sciences, University of Parma, Parma, Italy; <sup>2</sup>Pathology and Laboratory Medicine, University of Parma, Parma, Italy; <sup>3</sup>Nephrology and Dialysis, Desenzano Garda Hospital, Desenzano sul Garda, Italy; <sup>4</sup>Urology, Maggiore Hospital, Parma, Italy; <sup>5</sup>Nephrology, Policlinico Hospital, Milano, Italy; <sup>6</sup>Pathology, Treviso Hospital, Treviso, Italy

**Introduction and Aims:** Retroperitoneal fibrosis (RPF) is a rare disorder characterised by an overproduction of fibro-inflammatory tissue that usually

develops in the periaortic retroperitoneum and often involves abdominal structures such as the ureters. There are no established morphological criteria for the diagnosis of idiopathic RPF and the histopathological characterisation of the disease is limited to single case reports. We investigated the morphological and clinical characteristics of 24 consecutive idiopathic RPF patients. **Methods:** The retroperitoneal histological sections were stained with hematoxylin and eosin, the Van Gieson method for collagen, Congo Red, periodic acid-Schiff and the Weigert technique for elastic fibres. The sections were immunohistochemically analysed in order to study the fibrous component (smooth muscle actin, vimentin, S100, beta-catenin, cytokeratin pool, desmin, myogenin, myoglobin, ALK, human caldesmon, CD34, type I collagen) and the inflammatory infiltrate (CD3, CD4, CD8, CD20, CD68, CD138, granzyme B). Eight cases were also studied ultrastructurally.

**Results:** The clinical presentation of the majority of the patients was typical, with abdominal or back pain, constitutional symptoms and high acute-phase reactant levels: 20 had ureteral obstructive disease, 13 of whom developed acute renal failure. The retroperitoneal specimens consisted of fibrous tissue mixed with inflammatory infiltrate. The fibrous component was characterised by a mild-to-moderate and mitotically inactive myofibroblast population within varying amounts of type I collagen. Immunohistochemically, the myofibroblasts were positive for vimentin and, in the more cellular areas, for smooth muscle actin. Ultrastructurally, they appeared to be situated within thick bands of collagen made of thread-like fibrils. The inflammatory infiltrate, which included lymphocytes, macrophages, plasma cells and scattered eosinophils, had two main patterns: perivascular and diffuse. In the perivascular areas, the proportions of CD20+ and CD3+ cells were similar, with a CD4+/CD8+ ratio of 3:1; in the diffuse areas, there were more CD3+ than CD20+ cells, with similar amounts of CD4+ and CD8+ cells. Focal signs of inflammatory infiltration were found in the small retroperitoneal vessels of 11 cases.

**Conclusions:** In addition to the clinical, laboratory and imaging findings, the histological picture of a collagen-rich background with myofibroblastic elements lacking signs of proliferation, together with a diffuse and perivascular inflammatory infiltrate mainly consisting of T and B lymphocytes, may support the diagnosis of idiopathic RPF.

#### MP199 HIGH LEVELS OF MICROALBUMINURIA IS RELATED TO HYPERTENSION IN HIV POSITIVE PATIENTS

Morten Baekken<sup>1</sup>, Leiv Sandvik<sup>2</sup>, Johan Bruun<sup>1</sup>, Olav Oektedalen<sup>1</sup>.  
<sup>1</sup>Department of Infectious Diseases, Ullevaal University Hospital, Oslo, Norway; <sup>2</sup>Centre for Clinical Research, Ullevaal University Hospital, Oslo, Norway

**Introduction and Aims:** Microalbuminuria (MA) is a marker of nephropathy in diabetic and hypertensive patients and is considered an independent risk factor for coronary heart disease and all-mortality. HIV infected patients have an increased incidence of coronary vascular disease with increased vascular mortality. HIV associated renal diseases have been reported in retrospective and selected studies, but no former studies are population based. The present study is a large prospective epidemiological based study measuring the prevalence of MA and hypertension (HT) and the relation between MA and HT in a HIV positive population in the capital town of Norway.

**Methods:** 362 unselected HIV positive patients were included in the study. They had reached different stages of their disease and more than half of them had started highly active antiretroviral therapy (HAART). They were followed for 22 months with three repeated investigations of urine sample and blood pressure done. They were asked for risk factors as smoking, drug abuse and malignancy and blood samples were analysed for hematochemical data. MA was defined as albumin/creatinine ratio (ACR) > 2.5 mg/mmol and HT as mean systolic blood pressure (SBP) higher than 140mmHg. Ten of the subjects had known diabetes.

**Results:** The results showed a prevalence of 10.2% of MA (37 positive subjects) and a prevalence of 28.2% of HT (99 positive subjects) in the study group. MA was significantly related to HT ( $p < 0.0001$ ) and diabetes ( $p < 0.014$ ). The MA positive subjects had a mean SBP of 146 mmHg and the MA negative subjects a mean SBP of 128 mmHg. MA was neither related to body mass index (BMI) ( $p > 0.25$ ) or smoking ( $p > 0.78$ ).

**Conclusions:** MA was found frequently in a HIV positive population and is related to HT which often remains undiagnosed. The results may indicate a beginning renal dysfunction in HIV positive patients.

#### MP200 THE RENAL RESISTIVE INDEX (RI) BY DOPPLER ULTRASONOGRAPHY CORRELATES WITH THE DEGREE OF TUBULAR DEGENERATION IN GLOMERULAR DISEASES

Noriyo Kimura<sup>1</sup>, Naoki Takahashi<sup>1</sup>, Hideki Kimura<sup>1</sup>, Yukinori Kusaka<sup>2</sup>, Haruyoshi Yoshida<sup>1</sup>. <sup>1</sup>Division of Nephrology, University of Fukui Hospital, Matsuoka, Fukui, Japan; <sup>2</sup>Department of Environmental Health, University of Fukui, Matsuoka, Fukui, Japan

**Introduction and Aims:** The renal resistive index (RI) of the interlobar arteries by Doppler ultrasonography has been utilized to estimate the abnormalities in renal cortical perfusion. The correlations of RI with hypertensive renal dysfunction and severity of diabetic nephropathy have been demonstrated. Yet, there have been a few studies on the relationship between RI and renal histological findings. Our aim is to clarify the usefulness of measuring RI in patients with glomerular diseases by comparison with various renal biopsy findings.

**Methods:** Twenty-eight patients (16 males, 12 females) were examined by renal Doppler ultrasonography just before the renal biopsy. Their renal diseases (No. of the patients) were categorized as: minor glomerular abnormalities (4), mesangial proliferative glomerulonephritis including IgA nephropathy (7), Henoch-Schonlein purpura nephritis (5), ANCA-related glomerulonephritis (3), diabetic nephropathy (5) and the others (4). Hypertension was accompanied in 13 patients and hyperuricemia was accompanied in 5 patients. The clinical data were recorded at biopsy. The mean  $\pm$ SD values were; age:  $43 \pm 22$  y.o., proteinuria:  $2.0 \pm 2.4$  g/dl, serum creatinine:  $1.13 \pm 0.7$  mg/dl, creatinine clearance (Ccr):  $74 \pm 40$  ml/min, systolic blood pressure (SBP):  $125 \pm 20$  mmHg and diastolic blood pressure (DBP):  $70 \pm 10$  mmHg. Histological findings were examined quantitatively for obsolescent glomeruli and crescent formation and semi-quantitatively for glomerulosclerosis, tubular degeneration represented by tubular atrophy and loss, interstitial fibrosis, inflammatory cell infiltration and arteriosclerosis. The clinical and histological parameters were compared to RI by bivariate and multivariate analyses.

**Results:** RI correlated with age, Ccr, SBP, obsolescent glomeruli, glomerulosclerosis, tubular degeneration, interstitial fibrosis, inflammatory cell infiltration and arteriosclerosis by Pearson correlation test. Stepwise multiple regression analysis on histopathological parameters showed that tubular degeneration ( $p < 0.01$ ) and arteriosclerosis ( $p < 0.05$ ) were the independent factors for increased RI. After adjusting for all of the clinical parameters which showed significant correlations with RI, we found that only tubular degeneration was the independent contributor for increased RI among all the histological parameters ( $p < 0.01$ ). Furthermore, when the patients with diabetic nephropathy were excluded to rule out the bias of arteriosclerosis and tubular degeneration, we obtained the consistent results as described above.

**Conclusions:** In summary, increased RI correlated with the severity of tubular degeneration in patients with various glomerular diseases. This finding seems to suggest that increased RI is a reflection of decreased microvascular perfusion which is closely linked to tubular degeneration with the disease progression.

#### MP201 FLUID OVERLOAD IN ICU PATIENTS REVEALED BY DETERMINING THE PLASMA CLEARANCE OF IOHEXOL

Martin Tidman<sup>1</sup>, Per Sjöström<sup>1</sup>, Yvonne Dellmark<sup>1</sup>, Lars Berggren<sup>2</sup>, Tomas Vikerfors<sup>3</sup>. <sup>1</sup>Department of Medicine, University Hospital, Örebro, SE-70185, Sweden; <sup>2</sup>Department of Clinical Chemistry, University Hospital, Örebro, SE-70185, Sweden; <sup>3</sup>Department of Anesthesiology, University Hospital, Örebro, SE-70185, Sweden; <sup>4</sup>Department of Infectious Diseases, University Hospital, Örebro, SE-70185, Sweden

**Introduction and Aims:** Intensive care unit (ICU) patients often have a massive fluid overload due to fluid resuscitation. This may lead to cardiovascular complications and difficulties in drug dosing as the volume of distribution ( $V_d$ ) can be 2-3 fold the normal. Since the  $V_d$  of iohexol is the extracellular volume (ECV) this substance is suitable for determining ECV. **Methods:** We examined 46 patients; mean age 66.0 years (SD 10.9) that were being treated at the ICU, Örebro University Hospital. The patients received 5 ml of iohexol (647 mg/mL) and blood samples were drawn at T = 2 h, 4 h and 8 h. The concentration of iohexol in the serum samples was determined using a HPLC method (total coefficient of variation 2.6% at a

concentration of 65 mg/L). Height and weight were noted. Simultaneous calculation of ECV and GFR for the patients in ICU was done according to the principles presented by Brochner-Mortensen as multiple sample clearance (1, 2). The study was approved by the local ethics committee.

**Results:** In our patients a measured mean ECV of 27.9 L (SD 7.4) was noted. The calculated normovolemic ECV [(ECV<sub>calc</sub>=131\*BW+4330)/1000], where BW is the body weight of the patient prior to current sickness, was mean 15.7 L (SD 2.3). The mean fluid overload was 12.2 L (SD 7.7). Mean serum-creatinine was 149 µmol/L (SD 113) and mean iohexol-GFR was 51.3 ml/min/1.73 m<sup>2</sup> (SD 34.1).

**Conclusions:** We present a method to determine simultaneously the ECV and GFR in the ICU patient using plasma clearance of iohexol. With this method the degree of fluid overload can be estimated which can guide the clinician in fluid therapy and drug dosing. This method can easily be incorporated into daily clinical practice in the ICU. A simple spreadsheet calculator will be shown.

1. Brochner-Mortensen J. A simple method for the determination of glomerular filtration rate. *Scand J Clin Lab Invest.* 1972;30(3):271-4. 2. Brochner-Mortensen J. The extracellular fluid volume in normal man determined as the distribution volume of [51Cr] EDTA. *Scand J Clin Lab Invest.* 1982;42(3):261-4.

### MP202 CLINICAL PREDICTORS AND PATTERNS OF LEFT VENTRICULAR HYPERTROPHY IN PATIENTS WITH TYPE 2 DIABETIC NEPHROPATHY

Sung Kyu Ha, Sang Hun Lee, Hyeong Cheon Park, Soung Rok Sim, Ki Joong Kim, Woo Il Park. *Internal Medicine, Yonsei University College of Medicine, Seoul, South Korea*

**Introduction and Aims:** Diabetic nephropathy is the most common cause of end stage renal disease (ESRD) and its mortality mainly due to cardiovascular disease. Left ventricular hypertrophy (LVH) is an important risk factor for cardiovascular disease in patients with diabetic nephropathy. LVH is modulated by interactions of genetic, environmental and neuro-humoral factors. Various risk factors including serum uric acid are associated with LVH. However, the role of serum uric acid as an independent risk factor for LVH is controversial. We evaluated the association between multiple clinical and biochemical parameters (including angiotensin converting enzyme (ACE) gene polymorphism and serum uric acid) and LVH in patients with type 2 diabetic nephropathy.

**Methods:** Total of 180 (male, n=91; female, n=89) type 2 diabetic patients with overt proteinuria (≥500mg/24hr) or albuminuria (≥300 mg/day) were recruited in the study (mean age; male, 61±12; female, 63±13). Fifty seven patients were on hemodialysis. ACE genotype was determined by polymerase chain reaction. Left ventricular mass (LVM), left ventricular mass index (LVMI) and relative wall thickness (RWT) were assessed by two-dimensional echocardiography. LVH and hyperuricemia were considered to be present if LVMI > 131 g/m<sup>2</sup> and serum uric acid > 7mg/dL for men and LVMI > 100 g/m<sup>2</sup> and serum uric acid > 6 mg/dL for women.

**Results:** The prevalence of LVH was 140 out of 180 (77.8%) patients and distribution of LVH patterns was as follows; 42.0% eccentric hypertrophy, 35.9% concentric hypertrophy, 3.4% concentric remodeling and 18.7% normal, respectively. Clinical predictors affecting LVH in patients with type 2 diabetic nephropathy were hemoglobin level (r=-0.321, p=0.001), mean arterial pressure (r=0.259, p=0.001), serum creatinine (r=0.224, p=0.005), creatinine clearance (r=-0.267, p=0.001), serum uric acid level (r=0.178, p=0.036) and dialysis time (r=0.262, p=0.027). Both LVM and LVMI were higher in ACE DD genotype group than II genotype group in male (171.2 vs. 144.8, p=0.028). On the other hand, there were no differences in clinical and echocardiographic variables among three genotype groups (II, ID and DD) in female. The mean values of serum uric acid level were 5.9, 6.6 and 7.0 mg/dL in ACE II, ID and DD genotypes, respectively. Moreover, serum uric acid was positively associated with ACE DD genotype in patients with type 2 diabetic nephropathy (p=0.039).

**Conclusions:** These results suggest that LVH is associated with hemoglobin level, mean arterial pressure, serum creatinine, creatinine clearance, serum uric acid level and dialysis time in patients with type 2 diabetic nephropathy. LVH was associated with ACE DD genotype in males only.

### MP203 ACUTE RENAL FAILURE: ABILITY OF RIFLE CLASSIFICATION TO PREDICT OUTCOMES

Tariq Ali<sup>1</sup>, Izhar Khan<sup>2</sup>, William Simpson<sup>3</sup>, Massoud Boroujerdi<sup>4</sup>, W. Cairns Smith<sup>4</sup>, Alison MacLeod<sup>1</sup>. <sup>1</sup>Medicine & Therapeutics, University of Aberdeen, Aberdeen, United Kingdom; <sup>2</sup>Renal Medicine, NHS Grampian, Aberdeen, United Kingdom; <sup>3</sup>Biochemistry, NHS Grampian, Aberdeen, United Kingdom; <sup>4</sup>Public Health, University of Aberdeen, Aberdeen, United Kingdom

**Introduction and Aims:** Epidemiological studies of acute renal failure (ARF) are surprisingly sparse. We aimed to determine the incidence and factors affecting the development and recovery from ARF and acute on chronic renal failure (ACRF) in a population based study (population, 525,850). We included all patients with ARF whether or not they required renal replacement therapy (RRT). Using the RIFLE classification (Table), suggested by International Acute Dialysis Quality Initiative group, we tested the hypothesis that this classification predicts outcomes in ARF.

**Methods:** In this retrospective observational cohort study, we identified all patients with serum creatinine concentrations ≥150 mmol/l (male) or ≥130mmol/l (female) over a 6-month period (1/1/2003 to 30/6/2003). Using the abbreviated MDRD formula we estimated the glomerular filtration rate (GFR) and applied the RIFLE classification. Only the first three categories (R, I, F) were studied as the last two categories (L and E) are clinical outcomes. Patients' clinical outcomes were obtained from the case notes.

**Results:** 474 patients with ARF and 88 with ACRF were identified. The incidences of ARF and ACRF are 1803 and 335 per million population respectively. Mean age was 74.2 for ARF and 78.7 for ACRF. Sepsis (infection) was a precipitating factor in 47%. Mortality is high in ARF (32% in-hospital and 50% at 6 months). RIFLE classification was used in ARF cohort to predict renal recovery, RRT requirement, hospital stay and mortality (Table).

#### Results

Characteristic	Total	R	I	F	p value
ARF (%)	474	105 (22)	233 (49)	136 (29)	
Male (%)	254/474 (54)	56/105 (53)	118/233 (51)	80/136 (59)	0.134
Mean Age±SD	74.2±13.3	76.8±12.8	74.6±12.6	71.4±14.4	<b>0.006</b>
Full recovery (%)	321/474 (67)	75/105 (71)	176/233 (75)	70/136 (51)	<b>0.001</b>
RRT required (%)	37/474 (8)	1/105 (1)	7/233 (3)	29/136 (21)	<b>0.001</b>
Hospital stay (days)	17	13	18.5	18.5	<b>0.047</b>
Hospital stay (days)*	19	12	20	25	<b>0.001</b>
In-hospital mortality (%)	154/474 (32)	28/105 (27)	71/233 (30)	55/136 (40)	<b>0.05</b>
6-month mortality (%)	238/474 (50)	48/105 (46)	113/233 (48)	77/136 (57)	0.187

\*Those alive at 6-months. p values in bold are significant.

#### RIFLE Classification

Risk	Increased creatinine ×1.5 or GFR reduced by 25%
Injury	Increased creatinine ×2 or GFR reduced by 50%
Failure	Increased creatinine ×3 or GFR reduced by 75% or creatinine ≥ 350 mmol/l
Loss	Persistent ARF > 4weeks
ESRD	End Stage Renal Disease (>3 months)

**Conclusions:** We have measured the incidence of ARF and ACRF in a defined population and assessed the 6-month survival in the cohort of incident cases. RIFLE classification predicts RRT requirement, renal recovery, length of hospital stay and in-hospital mortality in ARF. There was a non-significant trend in 6-month mortality with severity of ARF.

### MP204 PLASMA CYSTATIN C FOR THE DETECTION OF RENAL FAILURE IN OBESE PATIENTS

Pierre Delanaye<sup>1</sup>, Etienne Cavalier<sup>2</sup>, Régis P. Radermecker<sup>3</sup>, Marcelle Rorive<sup>3</sup>, Gisèle Depas<sup>4</sup>, Jean Paul Chapelle<sup>2</sup>, Jean Marie Krzesinski<sup>1</sup>. <sup>1</sup>Nephrology-Dialysis-Hypertension, University of Liège, CHU Sart Tilman, Liège, Belgium; <sup>2</sup>Clinical Chemistry, University of Liège, CHU Sart Tilman, Liège, Belgium; <sup>3</sup>Diabetes-Nutrition-Metabolic Diseases, University of Liège, CHU Sart Tilman, Liège, Belgium; <sup>4</sup>Nuclear Medicine, University of Liège, CHU Sart Tilman, Liège, Belgium

**Introduction and Aims:** Obesity is now recognized as a risk factor for progression of renal failure. However, serum creatinine has clear limitations for estimating renal function in obese patients. We have here tested the

interest of a new plasma marker, cystatine C, for the detection of renal failure in such a population.

**Methods:** Patients with body mass index (BMI) over 30 kg/m<sup>2</sup> were included. The reference method for GFR measurement was Cr 51-EDTA (single injection method). GFR results were not corrected by body surface area. Renal failure was defined as a GFR below 70 ml/min. Serum creatinine was measured using the compensated Jaffe method and plasma cystatin C by particle-enhanced immunonephelometry (PENIA).

**Results:** The population included 67 patients, 17 males and 50 women. Their mean age was 48.8 ± 13.4 years and their mean BMI was 39.1 ± 6.4 kg/m<sup>2</sup>. The mean GFR measured by Cr 51-EDTA was 102.5 ± 30.2 ml/min (7 patients with a GFR less than 70 ml/min). Correlation coefficient between the reciprocal of creatinine and GFR measured by Cr 51-EDTA was 0.3992 (p=0.0008). Between the reciprocal of cystatin C and GFR, correlation coefficient was 0.4820 (p<0.0001). ROC curves analysis showed an area under the curves (AUC) slightly (but not significantly) better for cystatine C (AUC=0.813 for creatinine and 0.979 for cystatin C). To detect GFR below 70 ml/min, creatinine value that gave best sensibility-specificity was 1.04 mg/dl (sensitivity of 57.1% and specificity of 98.3%) and for cystatin C, the value was 1.11 mg/l (normal range: <1 mg/l)(sensitivity of 100% and specificity of 93.3%). There was no correlation between cystatine C values and weight or BMI.

**Conclusions:** It seems that cystatine C could be interesting for the detection of renal insufficiency in obese patients. In our population, the sensitivity of cystatin C is clearly higher than the sensitivity of creatinine. This should be confirmed on a larger sample.

#### MP205 A LONGITUDINAL STUDY OF CATECHOLAMINE PRODUCTION IN PREGNANCY

G. McMahon<sup>1</sup>, K. Abraham<sup>1</sup>, M. Little<sup>1</sup>, R. Fitzgerald<sup>1</sup>, M. Kennelly<sup>2</sup>, J.J. Walshe<sup>1,2</sup>. <sup>1</sup>Dept of Nephrology, Beaumont Hospital, Dublin, Ireland; <sup>2</sup>Rotunda Maternity Hospital, Dublin, Ireland

**Introduction and Aims:** Pre-eclampsia (PET) is a major cause of maternal and foetal morbidity. Vasoactive hormones have been implicated in this condition, however the role of catecholamines is uncertain. We examined the excretion of catecholamines (noradrenaline [NA], adrenaline [A] and dopamine [DA]) and their metabolites (normetadrenaline [NMA] and metadrenaline [MA]) during and after pregnancy. The aim of our study was to determine the pattern of catecholamine excretion in pregnancy and to establish whether there is a relationship between urine catecholamine levels and pregnancy-induced hypertension (PIH) and PET.

**Methods:** 270 healthy primigravidae were recruited prospectively into the study. They were divided into 3 groups. Group 1 were normotensive (n=229), group 2 had PIH (n=29) and group 3 had PET (n=12). We measured the concentration of catecholamines (using HPLC) relative to the creatinine concentration in single-voided urine samples in each trimester and at least 6 weeks post-partum. Blood pressure was also measured at each visit. The post-partum results were taken as equivalent to baseline pre-pregnancy values.

**Results:** There was no significant difference in the urinary concentrations of NA, A, DA, NMA or MA between the 3 groups at any stage of the pregnancy or post-partum. The NA, A, DA and MA levels remained constant throughout pregnancy. However, there was significant rise in the NMA levels from the first to the third trimesters (0.065 v. 0.082 mmol/molcr, p=0.023). When the post-partum values were compared to the third trimester values, there was a significant fall in the concentration of NA (0.049 v. 0.042 mmol/molcr, p=0.012), NMA (0.082 v. 0.059 mmol/molcr, p<0.0001), DA (0.366 v. 0.338 mmol/molcr, p=0.02) and MA (0.039 v. 0.036 mmol/molcr, p=0.02). This was seen in all 3 groups.

**Conclusions:** We found no relationship between the urine catecholamine concentration at any stage in pregnancy and the development of PIH or PET. However, when compared to the non-pregnant state, pregnancy is a state of sympathetic hyperactivity as manifested by a significant increase in urine catecholamine excretion which is evident from early in gestation.

#### MP206 DENDRITIC CELL SUBSETS AND SERUM INTERLEUKIN-12 (IL-12): THEIR ROLE IN THE PROGRESSION OF RENAL DISEASE IN PATIENTS WITH SCHISTOSOMAL ASSOCIATED NEPHROPATHY

Hayam El Aggan<sup>1</sup>, Mona Salem<sup>2</sup>, Wessam El Gendy<sup>3</sup>, Wageh El Gebaly<sup>4</sup>, Eman El Gohary<sup>1</sup>. <sup>1</sup>Medicine (Nephrology Unit), Faculty of Medicine, University of Alexandria, Alexandria, Egypt; <sup>2</sup>Pathology, Faculty of Medicine, University of Alexandria, Alexandria, Egypt; <sup>3</sup>Clinical Pathology, Faculty of Medicine, Alexandria, Egypt; <sup>4</sup>Medical Parasitology, Faculty of Medicine, University of Alexandria, Alexandria, Egypt

**Introduction and Aims:** Schistosomiasis is an endemic disease in Egypt that causes chronic infection. Dendritic cells (DCs) are one of the potent antigen-presenting cells. There are two distinct DC subsets, the myeloid DC (CD11c<sup>+</sup>) and the lymphoid DC (CD123<sup>+</sup>). Upon activation the myeloid DCs secrete interleukin-12 (IL-12). So, the present study was designed to study the DC subsets and serum level of IL-12 in patients with schistosomal associated nephropathy, also, their interaction and role in the progression of renal disease.

**Methods:** Forty five patients with schistosomal hepatic fibrosis (SHF) (15 patients in each subgroup; normoalbuminuria, microalbuminuria and macroalbuminuria) and 15 healthy control subjects were included in the study. An experimental study included 80 Swiss Albino mice infected with *schistosoma mansoni* (every 10 infected mice were sacrificed at 4, 6, 8, 10, 12, 14, 16, and 20 weeks post-infection) and 10 non-infected mice were used as controls. IL-12 P70 heterodimer in serum was determined. Circulating dendritic cell subsets were measured by using 3-color flow cytometry. Renal biopsies from patients with SHF and macroalbuminuria and kidneys of infected mice were examined histopathologically with light, immunofluorescent and electron microscopy. Renal tissue DCs and new vessels formation (angiogenesis) were detected by immunohistochemical technique using OX62 polyclonal antibody and factor VIII-related antigen respectively.

**Results:** In patients with micro and macroalbuminuria, the total leucocytic count, the percentage of CD11c<sup>+</sup> and CD 123<sup>+</sup> cells, CD11c<sup>+</sup>/CD123<sup>+</sup> ratio and serum IL-12 level were significantly decreased, while serum creatinine was significantly increased than the other groups. Renal tissues showed a significant increase in the number of DCs and angiogenesis compared to the normal renal tissues. The same was found in infected mice, as they started to increase from the 8<sup>th</sup>, 10<sup>th</sup> week post infection respectively, then they increased progressively till the 20<sup>th</sup> week. A positive correlation was found between of CD11c<sup>+</sup> subset and serum IL-12 (r = 0.728 P = 0.001). Serum creatinine showed a negative correlation with CD11c<sup>+</sup> subset (r = -0.748, P = 0.001) and serum IL-12 (r = -0.696, P = 0.001) and a positive correlation with renal DCs (r = 0.744, P = 0.001) and renal angiogenesis (r = 0.586, P = 0.022). A negative correlation was found between renal angiogenesis and serum IL-12 (r = -0.719, P = 0.003) and CD11c<sup>+</sup> subset (r = -0.626, P = 0.013).

**Conclusions:** In patients with SHF there was a deficiency of the circulating DC subsets specially the CD11c<sup>+</sup> that leads to decrease in IL-12 level. This decrease could be related to the influx of DCs into the inflamed kidneys, and could lead to increase in renal angiogenesis, play a role in the immunopathogenesis and progression of renal disease in these patients.

#### MP207 FINAL HEIGHT AFTER LONG-TERM TREATMENT WITH RECOMBINANT HUMAN GROWTH HORMONE (rhGH) IN CHILDREN WITH UREMIC GROWTH FAILURE

Richard Nissel<sup>1</sup>, Esat Ucur<sup>2</sup>, Otto Mehls<sup>3</sup>, Dieter Haffner<sup>1</sup>. <sup>1</sup>Department of Pediatric Nephrology, University Children's Hospital, Rostock, Mecklenburg - Vorpommern, Germany; <sup>2</sup>KIGS Medical Outcomes, Pfizer Pharma GmbH, Karlsruhe, Baden-Württemberg, Germany; <sup>3</sup>Department of Pediatric Nephrology, University Children's Hospital, Heidelberg, Baden-Württemberg, Germany

**Introduction and Aims:** Severe growth failure remains one of the challenging problems in the care of children with chronic renal failure (CRF). Although, rhGH appears as a promising treatment modality of uremic growth failure data on the effect of rhGH on final height in these patients are limited.

**Methods:** Here we report on final height data of rhGH Tx in severely

stunted (<-2.0 SD) children with CRF obtained from the KIGS Medical Outcomes (Pfizer International Growth Study). Final height data of 75 (47 male) initially prepubertal CRF patients who were treated with rhGH over a mean period of 6.1 years (range 2.3-13.8) were available. The mean age at start of rhGH Tx was  $10.7 \pm 2.7$  years, and mean standardized height was  $-3.5 \pm 1.6$  SD.

**Results:** RhGH Tx resulted in sustained catch-up growth. Mean standardized height was increased by 0.9 SD at attainment of final height in boys and girls, respectively (each  $p < 0.0001$ ). Mean adult height amounted to  $160 \pm 11$  cm ( $-2.6$  SD) in boys and  $149 \pm 8$  cm ( $-2.7$  SD) in girls. The mean change in standardized height in early treated boys (< 12 yrs.) and girls (< 10 yrs.) was  $1.1 \pm 1.1$  SD ( $p < 0.0001$ ) and  $1.1 \pm 0.8$  SD ( $p = 0.0012$ ), respectively. Multiple regression analysis revealed that the change in standardized height during the first year of rhGH Tx was significantly associated with the age ( $r = -0.53$ ;  $p < 0.0001$ ). The change in standardized height during the whole observation period was significantly associated with the degree of stunting at start of rhGH Tx ( $r = -0.33$ ;  $p = 0.0061$ ), the duration of rhGH Tx ( $r = +0.33$ ;  $p = 0.0039$ ) and the change in standardized height during the first year of rhGH Tx ( $r = +0.45$ ;  $p < 0.0001$ ).

**Conclusions:** Long-term rhGH Tx in severely stunted prepubertal children with CRF induces persistent catch-up growth resulting in a normal adult height (> -2 SD) in 32% of patients.

#### MP208 HIV ASSOCIATED NEPHROPATHY (HIVAN) IN NIGERIANS: PREVALENCE, CLINICAL FEATURES AND HISTOPATHOLOGY

Fatiu A. Arogundade<sup>1</sup>, Emem-Chioma Pedro<sup>2</sup>, Abubakr A. Sanusi<sup>1</sup>, F.S. Wokoma<sup>2</sup>, Adewale Akinsola<sup>1</sup>. <sup>1</sup>Department of Medicine, Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun, Nigeria; <sup>2</sup>Department of Medicine, University of Port-Harcourt Teaching Hospital, Port-Harcourt, Rivers, Nigeria

**Introduction and Aims:** The incidence and prevalence of HIV/AIDS in Nigeria had increased exponentially in the last decade. Unfortunately, information on its renal sequelae is sparse in the country.

**AIMS:** We aimed to determine the occurrence rate, clinical features and pathology of HIVAN in our patients.

**Methods:** Four hundred consecutive HIV/AIDS patients were screened over a 14 month period for renal disease using at least 1+ albuminuria and/or elevated serum creatinine above  $132 \mu\text{mol/L}$  ( $1.5 \text{mg/dl}$ ). Those with easily identifiable causes of renal disease- DM, Hypertension, obstructive uropathy etc were excluded by history and clinical evaluation. The socio-demographic data and clinical findings of recruited patients were obtained and documented. Their full blood count (FBC), CD4<sup>+</sup> count, serum electrolytes, urea, creatinine, serum proteins and total cholesterol were also carried out. Renal biopsy was done in 10 of the patients with established renal disease. Thereafter 30 consecutive HIV/AIDS patients with renal disease were compared with age and sex matched controls (30 consecutive HIV/AIDS patients without renal disease) to determine the risk factors for nephropathy such as gender, educational and marital status, BMI, severity of HIV as determined by CD4 count and nutritional status. Statistical analysis was done using SPSS version 10.0.

**Results:** 152 (38%) of the patients had HIVAN by our criteria. These include 210 (52.5%) females and 190 (47.5%) males with a Female:Male ratio of 1.1:1. The age range of HIVAN patients was 19 to 65 years (Mean  $\pm$  SD;  $35.80 \pm 10.01$  years) and the prevalence was higher in females 78 (51.3%) than in males 74 (48.7%). Systolic and diastolic hypertension was seen in 11.2% and 13.2% respectively. The mean BMI, PCV, CD4<sup>+</sup> count, serum creatinine and 24 hour protein excretion in HIVAN patients were  $18.5 \pm 3.1 \text{ kg/m}^2$ ,  $25.26 \pm 6.81\%$ ,  $246.49 \pm 192.8 \text{ cells}/\mu\text{L}$ ,  $210.11 \pm 337.8 \mu\text{mol/L}$  and  $2.57 \pm 2.42 \text{g/day}$  respectively.

In the case-control comparison, we found statistically significant differences in only marital status, educational status, CD4 count and creatinine clearance less than 60ml/min between HIVAN patients and controls. Serum albumin and total cholesterol were significantly lower in HIVAN patients compared with controls while serum globulin was higher in HIVAN patients. HIV-FSGS with glomerular collapse was the predominant pathologic finding in our patients.

**Conclusions:** The prevalence of HIVAN in Nigeria is high and is almost of equal proportion in males and females. Low CD4 count, serum albumin and

cholesterol significantly predict HIVAN. The pathology seen in our patients is similar to that in blacks elsewhere.

#### MP209 OXIDATIVE STRESS, MICRO-INFLAMMATION AND RENAL FUNCTION IN OBESE CHILDREN AND ADOLESCENTS

K. Sebekova<sup>1</sup>, M. Jancuskova<sup>2</sup>, A. Heidland<sup>3</sup>, L. Podracka<sup>2</sup>. <sup>1</sup>Slovak Medical University, Bratislava, Slovakia; <sup>2</sup>PJS University, Kosice, Slovakia; <sup>3</sup>University of Wuerzburg, Wuerzburg, Germany

**Introduction and Aims:** Obesity represents one of the largest threats to public health and its prevalence in children is rising rapidly. The prevalence of overweight/obesity in children and adolescents in Slovakia was reported to be 16.5% in the age group of 9- to 11- year-olds, and 12% in the age group of 14- to 18- year-olds, representing a 50% increase over the last 5 years (Ginter, 2004). Abdominal fat tissue is a potent endocrine organ. In a pilot study we aimed to evaluate the impact of obesity on selected markers reflecting enhanced oxidative stress, micro-inflammation and renal function in children/adolescents.

**Methods:** Eighteen healthy obese children (O, 7F/11M; age:  $11.7 \pm 4.3$  years; 14 children: BMI > 97 percentile, 4 children: between 95 and 97 percentile of age/sex corrected BMI) were compared with 18 age- and sex-matched healthy non-obese controls (CTRL, 10F/8M, age:  $11.6 \pm 6.0$  years, BMI < 95 percentile). Plasma levels of fluorescent advanced glycation end products (AGEs), advanced oxidation protein products (AOPPs), interleukin-6 (IL-6), C-reactive protein (CRP), micro-albuminuria, urinary 8-hydroxy-2-deoxyguanosine (8-OHdG) excretion and renal function were determined.

**Results:** No significant differences between the groups were observed concerning fluorescent AGEs and AOPPs in the plasma. CRP concentration (O:  $0.16 \pm 0.45 \text{ mg/dl}$  vs. CTRL:  $0.02 \pm 0.08 \text{ mg/dl}$ ;  $p = 0.26$ ) and micro-albuminuria (O:  $60 \pm 45 \text{ mg/24h}$  vs. CTRL:  $32 \pm 26 \text{ mg/24h}$ ;  $p = 0.07$ ) tended to be higher in the obese group. However, the plasma concentration of pro-inflammatory cytokine IL-6 (O:  $24.3 \pm 23.7 \text{ pg/ml}$ , CTRL:  $7.6 \pm 9.4 \text{ pg/ml}$ ;  $p = 0.02$ ) as well as the urinary excretion of 8-OHdG, a marker of oxidative DNA damage (O:  $1.5 \pm 0.7 \text{ mg/mmol creatinine}$  vs. CTRL:  $1.0 \pm 0.5 \text{ mg/mmol creatinine}$ ;  $p = 0.04$ ) was significantly higher in the obese group.

**Conclusions:** Obesity already in childhood and adolescence is associated with a rise in some inflammatory markers and results in oxidative DNA damage.

### Clinical nephrology 3

#### MP210 ATHEROSCLEROTIC RENAL ARTERY STENOSIS IDENTIFIED AT THE TIME OF CARDIAC CATHETERIZATION: IMPACT ON KIDNEY FUNCTION

Nadia Zalunardo<sup>1</sup>, Caren Rose<sup>1</sup>, Michael Schacter<sup>2</sup>, Andrew Starovoytov<sup>3</sup>, Krishnan Ramanathan<sup>3</sup>, Christopher Buller<sup>3</sup>, John Duncan<sup>1</sup>, Adeera Levin<sup>1</sup>. <sup>1</sup>Nephrology, University of British Columbia, Vancouver, BC, Canada; <sup>2</sup>Medicine, University of British Columbia, Vancouver, BC, Canada; <sup>3</sup>Cardiology, University of British Columbia, Vancouver, BC, Canada

**Introduction and Aims:** The effect of atherosclerotic renal artery stenosis (ARAS) treated medically or by percutaneous intervention (PCI) on kidney function remains poorly defined. The aim of this study was to assess decline in GFR over time in patients with ARAS identified at the time of cardiac catheterization.

**Methods:** Between June 1, 2001 and Dec 31, 2004, patients undergoing non-emergent coronary angiography underwent angiographic screening for ARAS if they met the following criteria: resistant/severe hypertension, unexplained kidney dysfunction, acute pulmonary edema, or severe atherosclerosis. Patients with ESRD or a pre-existing diagnosis of renal parenchymal disease were excluded. Patients with  $\geq 50\%$  stenosis of at least one renal artery were prospectively followed for changes in kidney function. PCI was performed at the physician's discretion for the following indications: resistant hypertension, preservation of kidney function, flash pulmonary edema/CHF control, or ACE inhibitor/ARB intolerance. The