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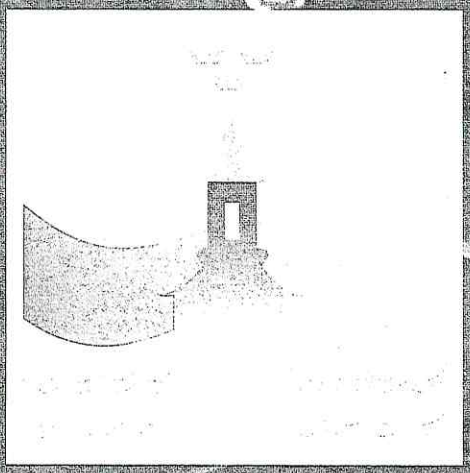

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increase in serum calcium in the LC group. The difference between groups in the mean change in serum calcium from baseline was not statistically significant at Week 4 ($P = 0.0569$). However, at Week 8, the difference was statistically significant (+0.03±0.01 mmol/L [LC] *versus* -0.02±0.02 mmol/L [PLB], $P = 0.0202$).

Conclusions: In patients with CKD Stages 3 and 4, LC therapy is associated with a reduction in Ca x PO_4.

Disclosure: This study was supported by Shire Pharmaceuticals.

SP101 25-HYDROXYVITAMIN D AND 1,25-DIHYDROXYVITAMIN D LEVELS IN PATIENTS WITH CKD STAGES 3 AND 4 ARE NOT AFFECTED BY LANTHANUM CARBONATE: RESULTS FROM A RANDOMIZED MULTICENTRE TRIAL

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Introduction and Aims: Vitamin D deficiency, as defined by a reduction in the level of 25-hydroxyvitamin D (25-OH D, calcidiol) to < 75 nmol/L together with a decline in the activity of 1-alpha hydroxylase in the kidney, contributes to the abnormalities in 1,25-dihydroxyvitamin D (1,25-$[OH]_2$ D, calcitriol) production associated with chronic kidney disease (CKD). With the increasing awareness of the consequences of vitamin D deficiency and the need for oral vitamin D replacement therapy, phosphate-binding agents that increase the risk of hypercalcemia or decrease the bioavailability of oral vitamin D need to be used with caution [1]. The present analysis was done to determine if treatment with lanthanum carbonate (LC), a noncalcium-based phosphate binding agent, in patients with CKD Stages 3 and 4, interfered with the bioavailability of oral vitamin D supplements as judged by a reduction in 25-OH D or 1,25-$(OH)_2$ D levels.

Methods: Patients with 2 consecutive serum phosphate (PO_4) measurements of >1.49 mmol/L received LC or placebo (PLB) treatment, initiated at 750 mg/day and titrated to a maximum of 3000 mg/day over an 8 week period with the target of achieving a PO_4 level of <1.29 mmol/L. Of the 121 patients randomized to treatment, 33 patients (LC = 17, PLB = 16) were identified as having received either ergocalciferol ($n = 13$), calcitriol ($n = 9$), doxercalciferol ($n = 6$) or paricalcitol ($n = 5$). Results are reported as mean ± SE.

Results: At screening, eGFRs were 21.30±1.42 mL/min/1.73m^2 (LC, $n = 17$) and 23.20±2.52 mL/min/1.73m^2 (PLB, $n = 14$). Baseline 25-OH D levels were 40.93±3.52 nmol/L in the LC group ($n = 17$) and 43.93±5.77 nmol/L in the PLB group ($n = 13$). At the end of the study (EOS), the change from baseline in 25-OH D levels was not statistically significant between LC and PLB groups (6.51±5.90 nmol/L [$n = 16$] *versus* 4.62±6.81 nmol/L [$n = 12$], $P = 0.8355$). Baseline 1,25-$(OH)_2$ D levels were 54.86±8.29 pmol/L in the LC group ($n = 15$) and 66.82±14.90 pmol/L in the PLB group ($n = 13$). At EOS, the difference between LC and PLB groups in the change from baseline in 1,25-$(OH)_2$-D levels was not statistically significant (-4.84±5.30 pmol/L [$n = 12$] *versus* -10.35±5.54 pmol/L [$n = 11$], $P = 0.4825$). Baseline serum calcium levels were 2.20±0.03 mmol/L in the LC group ($n = 17$) and 2.22±0.04 mmol/L in the PLB group ($n = 16$). At EOS, the difference between LC and PLB groups in the change from baseline in serum calcium levels was not statistically significant (0.02±0.03 mmol/L [$n = 15$] *versus* -0.003±0.030 mmol/L [$n = 14$], $P = 0.6733$).

Conclusions: LC does not affect 25-OH D or 1,25-$(OH)_2$ D levels in patients with CKD Stages 3 and 4.

Disclosure: This study was supported by Shire Pharmaceuticals.

Reference: 1. Fournier A, Chertow GM. *NDT* 2001; 16: 429–430.

SP102 THE ROLE OF INFRARED SPECTROSCOPY IN THE EVALUATION OF URINAY CRYSTALS

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Introduction and Aims: For the identification of the urinary crystals, the three following combined criteria are currently used: 1) the knowledge of the most common morphological appearances; 2) the knowledge of the polarizing features; 3) the knowledge of the urinary pH. However, in some instances, these criteria are not conclusive. For such cases infrared spectroscopy can be used. We report the results obtained by this technique over a 52 month period.

Methods: Record of the type(s) of crystals found in the urine sediments examined by phase contrast microscopy and polarized light in the laboratory of our renal unit from January 1st, 2002 to April 30th, 2006. For all crystals which could not be identified the three combined criteria described above analysis by infrared spectroscopy.

Results: Crystals were found in 807/9.834 (8.2%) urinary sediments. Of these, 793 (8.0%) were identifiable crystals: 598 (75.4%) were made up of only one type of crystal (in decreasing order, calcium oxalate, uric acid, amorphous phosphate, amorphous urate, cholesterol, and triple phosphate), while 195 (24.6%) contained a mixed crystalluria, made up of various combinations of the above. 14 samples (0.14%) contained unusual crystals which were analysed by infrared spectroscopy with the following results: bihydrate uric acid: 1; mono- or bi- hydrated calcium oxalate: 2; atypical calcium phosphate: 1; atypical calcium carbonate:1; hexahydrate magnesium ammonium phosphate ± calcium carbonate: 2; complex amorphous urate: 1; drug-induced: 2 (amoxycillin and indinavir respectively); a possible drug of unknown nature: 1; Tamm-Horsfall glycoprotein: 1. Two samples were found to contain not enough crystals for an adequate infrared spectroscopy analysis.

Conclusions: In the laboratory of our renal unit, crystalluria is found in 8% of all urinary sediments. In the vast majority of cases crystals can easily be identified with a conventional approach while for the identification of the unusual types infrared spectroscopy is needed. This technique showed that atypical crystals *a)* can have a common chemical composition (e.g., magnesium ammonium phosphate ± calcium carbonate; complex amorphous urate) in spite of an unusual appearance *b)* can be due to drugs, which can cause acute renal failure by intrarenal precipitation *c)* can be due to Tamm-Horsfall glycoprotein, a finding never reported so far.The analysis by infrared spectroscopy of urinary crystals discloses new faces of crystallurias, some of which can have clinical implications.

SP103 IS CYSTATIN C INFLUENCED BY INFLAMMATION? A RETROSPECTIVE ANALYSIS IN 996 CRITICAL ILL PATIENTS

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Introduction and Aims: To data, there is not a marker of renal function able to detect real time acute changes in kidney function. In clinical practice the more extensively used markers of renal function, despite their limitation, are serum Creatinine (sCr), creatinine clearance (CrCl) and urine output. In the last two decades, Cystatin C (Cys C) was studied as a valid marker of glomerular filtration in chronic renal dysfunction and as a promising marker in acute kidney injury. Nevertheless Cys C is lately associated with inflammatory biomarkers as C Reactive Protein (CRP). Critical ill patients are often characterized by an inflammatory state, decreasing Cys C reliability as a pure marker of renal function. The aim of this study is to evaluate the influence of inflammation markers on Cys C levels and a possible correlation between sCr and Cys C, in 996 patients admitted in intensive care units.

Methods: We conduced a retrospective analysis on 996 patients (611 male, 389 female, mean age 64,3±15,1) admitted in Intensive Care Unit (ICU) since October 2004 until March 2007. During hospitalization, these patients were monitored for CRP, sCr and Cys C at the same time for a total of 3993 samples. Correlations between Cys C *vs* CRP, sCr *vs* CRP and sCr *vs* Cys C were evaluated. The statistical analysis was performed using Pearson's test. P <0.05 was considered statistically significant.

Results: At admission, the mean and SD of sCr, CRP and Cys C were 1.19±1.02 mg/dl, 61.9±89.4 mg/L, 1.51±0.96 mg/L respectively (Table1) and statistical analysis showed a significant correlation between sCr and Cys C (r=0.815, r^2= 0.664, p<0.01), instead between Cys C and CRP demonstrated a low correlation (r=0.190, r^2=0.036, p<0.05) as well as sCr and CRP (r=0.158, r^2=0.025, p<0.05). These results were confirmed also on 3993 samples collecting during patients hospitalization: Cys C vs CRP, r=0.201, r^2=0.040, p<0.05; sCr vs Cys C r=0.739, r^2=0.546, p<0.01.

Table 1.Mean ± SD, minimum and maximum values of sCr, Cys C, CRP and Age of 996 patients admitted in ICU

	mean± SD	min	max
Age (years; mean±SD)	64,3±15,1	17	93
Cystatin c (mg/L)	1,51±0,96	0,34	9,26
Creatinine (mg/dl)	1,19±1,02	0,2	11,12
CRP (mg/L)	61,9±89,4	0,2	543,2

Conclusions: Our data show the variation of serum levels of Cys C and CRP are independent. Moreover the significant correlation between sCr and Cys C confirmed its potential role in the monitoring of acute kidney injury.

SP104 IMPAIRED SYMPATHETIC AUTONOMIC RESPONSE TO HEAD-UP TILT TESTING IN PATIENTS WITH SEVERE CHRONIC KIDNEY DISEASE

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Introduction and Aims: Patients with end-stage renal disease suffer from cardiovascular autonomic dysfunction (CAD) which contributes to the excessively increased mortality in this population. Far less is known about the development and severity of CAD in predialysis patients with chronic kidney disease (CKD). Aim of this study was the non-invasive assessment of cardiovascular autonomic function at different stages of CKD using power spectral analysis of heart rate and blood pressure variability and tilt-table testing.

Methods: Forty patients (m/f: 17/23; age: 47.4±12.9 years) were enrolled and stratified into two groups dependent on the stage of CKD: eGFR <30 ml/min (CKD stage IV/V, n=16) and eGFR ≥30ml/min (CKD stage I-III, n=24). Haemodynamic parameters were evaluated using ECG, impedance cardiography and continuous blood pressure measurement. Autonomic function was assessed by power spectral analysis of heart rate (HRV) and blood pressure variability (BPV). The normalised power of the low frequency band of BPV (LFnu, 0.04-0.15 Hz) and the high frequency band of HRV (HFnu, 0.15-0.40 Hz) were used as measures of sympathetic and parasympathetic activity; sympatho-vagal balance was assessed by the LF/HF ratio. Baroreflex sensitivity was analysed using the sequence technique. All haemodynamic and autonomic measurements were performed during 10 minutes of supine rest followed by 10 minutes of 70° head-up tilt standing position. Additionally, standard autonomic function tests (modified Ewing battery) were applied.

Results: Both groups did not differ in terms of age, gender, body mass index, smoking status and frequency of arterial hypertension. Blood pressure, heart rate, stroke index and total peripheral resistance index were comparable between both groups in supine and upright position with similar tilt-induced changes. During supine rest patients with CKD IV/V showed higher sympathetic vasomotor activity, followed by a significantly lower absolute increase during orthostatic burden compared to patients with CKD I-III (ΔLFnu 7.3±9.2 *vs* 16.8±12.7%; p=0,033). LF/HF was comparable between both groups in supine position, but increased with upright posture only in CKD I-III (p<0.001) resulting in a significantly higher LF/HF during tilting phase in this group (4.91±2.71 *vs* 2.66±2.02; p=0.012). Baroreflex sensitivity did not differ between both groups. Using the modified Ewing battery discrimination in autonomic function between both groups was not possible.

Conclusions: With decreasing renal function an increased centrally generated sympathetic vasomotor activity is found. The impaired sympathetic autonomic reflex response to orthostatic burden in patients with CKD IV/V indicates an early cardiovascular autonomic dysfunction present already before reaching end-stage renal disease. This early alteration can only be detected using sensitive techniques as power spectral analysis of HRV and BPV.

SP105 CYSTATIN C AND SERUM CREATININE LEVELS IN DIAGNOSIS OF ACUTE KIDNEY INJURY: A PILOT STUDY IN INTENSIVE CARE UNIT

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Introduction and Aims: The occurrence of Acute Renal Failure (ARF) in critical ill patients is between 1,1- 31%, according to the definition of ARF, and is associated with excess mortality. It is know that an early diagnosis and therapy of ARF improves the prognosis. Despite serum creatinine (sCr) is the most common marker of renal function, it has some limit above all in critical ill patients. In the last two decades several markers were proposed to detect acute change of renal function. Serum cystatin c (Cys C) was validate as a good marker in chronic state of renal insufficiency but less it is known about its reliability to detect real time acute kidney injury. The aim of the study is to determine the role of serum Cys C levels in diagnosis of ARF in Intensive Care Unit (ICU) patients.

Methods: Twenty-three consecutive ICU patients (13 males, 10 females; mean age 65±20,79 years), with normal renal function at the admission in ICU, were daily monitored for serum Cys C levels. To determine ARF events, sCr levels and urine output were detected; moreover the creatinine clearance was daily calculated with MDRD formula for all patients. In accord with RIFLE criteria, the AFR was defined as Injury level.

Results: 10 out of 23 patients had Injury level of ARF, 5 of them starting RRT. At the day of AFR, the serum Cys C levels were always higher than normal values, and the Cys C and sCr levels had a good correlation (R_2 0,6559; p <0,05). Moreover, comparing the *timing* of increase of serum Cys C levels to the diagnosis of ARF, we observed in all patients levels of serum Cys C higher than the normal 5,5±4 days before the ARF. In all case of high Cys C levels we observed AFR.

Conclusions: The serum Cys C is a useful marker of renal function in ICU, as well as sCr; in our small population, the Cys C predicted the ARF 5,5 days before the Injury level of RIFLE criteria, without false positive cases. Larger population needs to confirm this results.

SP106 REMOVAL OF CARNITINE BY DIALYSATE IN HAEMODIALYSIS (HD) AND PERITONEAL DIALYSIS (PD) PATIENTS

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Introduction and Aims: The principle route of carnitine loss in HD patients is via waste dialysate. As little is known about muscle carnitine status in PD patients, the aim of the present study was to compare dialytic carnitine loss in HD and PD patients to examine both the scale and variability of carnitine removal.

Methods: Dialysate samples from partial sampling of complete dialysate waste collection were obtained from 34 HD patients (age 62.9±2.5 y; body mass 71.8±2.1kg) who had been on dialysis treatment 36.4±4.3 months (range 3-95 months), 23 PD patients (age 60.9±3.1 y; body mass 72.6±2.3 kg) who had been on dialysis treatment for 31.7±4.9months (range 1-88 months), and analysed for total carnitine content (TC; sum of free and acylcarnitine).

Results: The mean (±SE) dialysate TC content following a 4 h HD session was 0.97±0.08mg/kg, equating to a weekly TC loss of approximately 3mg/kg. The HD dialysate TC content was independent of patient age and time on dialysis treatment.

Similarly, the mean (±SE) dialysate TC content following a 24 h PD session was 0.36±0.03mg/kg, equating to a weekly TC loss of around 3mg/kg. Again the PD dialysate TC content was independant of patient age and time