

PTH (Rad.) – 14.46. The p were divided into 4 groups according to PTH: Group I: <150, II: 150-300, III: 300-600 and IV: >600.

RESULTS: The 105 p the uncorrected basal PTH I: 3, II: 12, III: 46, IV: 43. In the final control, uncorrected PTH was I: 14, II: 30, III: 24 and IV: 15. Having corrected basal PTH levels, significant differences were observed (p<0.000): group I_c increased to 8 p (I: 2.9% vs I_c: 7.6%); 6 p. from group III changed to group II_c (II: 11.4% vs II_c: 12.4%); 8 p from group IV were incorporated into group III_c (III: 43.8% vs III_c: 45.7%) and group IV was therefore reduced from 41.9% to 34.3% in group IV_c. Then, we have treated 14.3% (n=15) prematurely, which, if adjusted to the method, represents 20% (n=21) (p<.0001). At the end, the comparison between corrected and uncorrected groups was: I: 16 vs 29, II: 31 vs 27, III: 26 vs 22 and IV: 16 vs 11 (p<.0001).

CONCLUSIONS: 1-There is a significant difference between the PTH corrected and uncorrected. 2-Of all, 12 were treated unnecessarily. 3-Subsequent to the treatment, 29 p. presented a PTH <150, 13 more than what was initially known, between 150-300 they were similar, 31 vs 27 p, whereas with >300, more uncorrected (42) than corrected ones (33).

Disclosure of Financial Relationships: nothing to disclose

SA-PO2683

A Cost-Effectiveness Comparative Study between Two Non Calcium Non-Aluminium Phosphate Binders: Sevelamer and Lanthanum Carbonate M. Dolores Arenas,¹ Analía Moledous,¹ M. Teresa Gil,¹ Tamara Malek,¹ Fernando Alvarez-Ude,² Pablo Rebollo.³ ¹Nephrology, Hospital Perpetuo Socorro, Alicante, Spain; ²Nephrology, Hospital General de Segovia, Segovia, Spain; ³BAP Health Outcomes, BAP Health Outcomes, Oviedo, Spain.

Introduction: The new phosphate binders have increased the possibilities for serum phosphate control, at the expenses of significant increases in costs. **Objective:** to compare the cost-effectiveness of two recently introduced P binders not containing calcium neither aluminium: sevelamer and lanthanum carbonate. **Methods:** Prospective study in which 59 patients on HD treated with sevelamer (Renagel®) were changed to lanthanum carbonate (Fosrenol®). The change was done as follows: patients with serum P < 5.5 mg/dl - 500 mg and patients with serum P > 5.5 mg/dl - 750 mg of lanthanum carbonate tablets three times daily with meals in both cases; independently of the sevelamer dose they were taking at that moment. We evaluated the results one month after stopping sevelamer and starting lanthanum carbonate. We analyzed: number of tablets prescribed; monthly costs at such doses; % of accomplishment of phosphate control. The results are expressed in terms of pharmacological cost per patient that reaches the objective of serum phosphate < 5.5 mg/dl. Cost per patient within the objective= Cost-month-patient / % patients within the objective x 100

Results: The cost /month /patient with renagel was 303.07 euros and with fosrenol was 214.7 euros. The % patients within the objective was 54.2% with renagel and 67.7% one month after fosrenol. The cost per patients within the objective was 558.8 € with renagel and 316.8 € with fosrenol. Four patients (6.9%) had to stop lanthanum carbonate due to secondary effects or discomfort (2 constipation; 1 nausea; 1 chewing difficulties). The mean daily of tablets of renagel were 8,57 and of fosrenol were 3 pills. **Conclusions:** Lanthanum carbonate appears to be cost-effective as compared with sevelamer, requiring less number of tablets, a fact that might improve adherence, and that probably explains better results with lower costs. Its long term efficacy should be studied.

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SA-PO2684

Are Patients on Lanthanum Carbonate at High Risk for Gadolinium-Associated Nephrogenic Systemic Fibrosis? Sundaraman Swaminathan,¹ Whitney High,³ Kim D. Hiatt,² Sudhir V. Shah.¹ ¹Nephrology, University of Arkansas for Medical Sciences, Little Rock, AR; ²Dermatology, University of Arkansas for Medical Sciences, Little Rock, AR; ³Dermatology, University of Colorado for Health Sciences, Denver, CO.

Introduction: Exposure to gadolinium, a lanthanide, has been strongly associated with nephrogenic systemic fibrosis (NSF)-a disease with high mortality. Lanthanum carbonate is a widely used phosphate binder containing lanthanum, a lanthanide with toxicological properties similar to gadolinium. Since lanthanum accumulates in CKD patients, patients on lanthanum may be at higher risk for gadolinium-associated NSF.

Methods: In this report, we present clinical data on three patients with biopsy-proven gadolinium-associated NSF who also concurrently received lanthanum carbonate as a phosphate binder. In two of these patients who died, we evaluated the organs retrieved at autopsy for lanthanum content using inductively-coupled mass spectrometry.

Results: All three NSF patients had received gadolinium contrast (Gd-DTPA-BMA) before the onset of NSF. All of them also concurrently received lanthanum carbonate before NSF onset and were on dialysis (2 HD, 1 PD). NSF was clinically very severe in all these patients and resulted in severe fibrosis that confined them to wheelchair or made them bed-bound. Two patients subsequently died of cardiac and vascular disease. At autopsy, in patient 1, skin (3 g/g), heart (1.5 g/g) and peritoneum (1.75 g/g) contained significant quantities of lanthanum. In patient 2, skin (0.86 g/g), heart (4.58 g/g), lung (2.1 g/g), liver (2.1 g/g), and aorta (1.1 g/g) contained significant quantities of lanthanum.

Conclusion: This is the first evidence of generalized systemic accumulation of lanthanum in end-stage renal disease and NSF. Concurrent lanthanum and gadolinium exposure appears to be associated with severe NSF and high mortality. Biologic implications of cardiac and vascular accumulation of lanthanum in ESRD merits further evaluation. In the meantime, we recommend caution in administering gadolinium to patients who are receiving lanthanum carbonate and close monitoring of these patients for NSF.

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SA-PO2685

Patient Phosphate Questionnaire: A Tool To Understand and Manage Phosphate (PO4) in ESRD Patients Peter H. Juergensen,^{1,2,3} Tamzin J. Marchese,³ Rebecca J. Purcell,³ Fredric O. Finkelstein.^{1,2,3} ¹Medicine, Metabolism Associates, New Haven, CT; ²Nephrology, Yale University School of Medicine, New Haven, CT; ³Nephrology, Renal Research Institute, New York, NY; ⁴Nephrology, Hospital of St. Raphael, New Haven, CT.

Hyperphosphatemia (HP) is a problem for ESRD pts with over 40% of pts having phosphate levels > 5.5mg%. HP is felt to be related in part to 2^o hyperparathyroidism, dietary indiscretion, poor utilization of PO4 binders, and vitamin D therapies. The present study was designed to evaluate pts' understanding of PO4 management by utilizing a questionnaire (Q) examining pts knowledge of and compliance with PO4 therapy.

40 pts (34HD and 6 PD) participated in the study; their mean (+/- SD) time on dialysis was 21.5 +/- 1.5 months. Pts rated on a 1 to 5 scale (5=very aware and 1=poorly aware) 1) if they knew why their PO4 level was important (mean ± SD= 3.66 ± 1.83; 2) if they knew which foods were high in PO4 (3.83 ± 1.58); 3) if their prescribed diet was easy to understand (4.34 ± 1.06). When asked how often their diet should be discussed, 35% said once per month and the remainder less often. When asked if they eat foods not recommended, 100% answered yes. 21 of 40 (53%) cooked for themselves and followed their diet most of the time. 22 (55%) ate at restaurants > once a week and 67% took their binders to the restaurant. 85% rated their education as good/excellent and 15% as fair. 53% did not want any additional education. When asked to identify high phosphate foods: 28 noted dairy, 21 protein, 27 dark drinks, 28 nuts, and 16 incorrectly identified two low PO4 foods as containing PO4. 19 (48%) did not know the ideal PO4 levels. No pts complained of side effects or cost issues with their binder therapy. 21 pts had 3 month average PO4 > 5.5; only 9 of these 21 pts wanted more education and 18 of these 21 did not know the ideal PO4 levels.

These findings demonstrate that pts overall understanding of dietary PO4 issues is limited. Further study is required to investigate how to improve patients' education concerning PO4 and improve their compliance with diet. New educational tools need to be devised to improve PO4 control.

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SA-PO2686

Illness Beliefs Strongly Predict Achievement of Target Serum Phosphate Levels in Haemodialysis Joe Chilcot,^{1,2} Enric Vilar,² David Wellsted,¹ Ken Farrington.² ¹School of Psychology, University of Hertfordshire, United Kingdom; ²Renal Unit, Lister Hospital, United Kingdom.

Background: Serum phosphate (SPo₄) is a marker of adherence and is associated with mortality in HD patients. Psychological models may be useful in predicting adherent behaviour. Illness representations concern cognitive and emotional factors that influence coping and health behaviour (adherence). However, the psychological predictors are poorly described and their identification requires knowledge of confounding biochemical factors.

Aims: 1) To identify biochemical correlates of SPo₄ 2) To define the interaction between phosphate adherence and illness beliefs, correcting for biochemical predictors of phosphate.

Materials and Methods 1) We retrospectively analysed 869 HD patients to identify significant biochemical correlates of SPo₄. 2) Ninety-one HD patients prospectively completed the revised illness perception questionnaire, with biochemical parameters known to be correlated with SPo₄ averaged for the 3 months pre-assessment.

Results: SPo₄ was significantly positively correlated with albumin, creatinine, urea, and PTH at 24 months (r ranging 0.115-0.455, p ranging <0.035 to <0.001) and negatively with both residual renal function and age (r=-0.23 and -0.28, p=0.001). Regression analysis in the prospective study revealed that PTH (p=0.003), creatinine (p=0.001) and illness identity (p=0.004) significantly predicted SPo₄, after controlling for the correlates described above, comorbidity, CRP, emotional and perceived consequence beliefs (R²=0.321 F(3,82)=12.3, p=0.001). Patients with high SPo₄ (>1.78 mmol) had significantly higher illness identity (p=0.001) and perceived consequences scores (p=0.04), compared to patients with adequate SPo₄ (1.13-1.78mmol). After adjusting for confounding variables using ANCOVA, illness identity remained significantly higher in patients with high phosphate, compared to those with adequate levels (F(1,74)=4.6, p=0.035).

Conclusions: We have identified significant predictors of SPo₄ in HD patients, including illness identity. The importance of illness representations upon adherent behaviour provides an empirical base from which psychological interventions can be developed.

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SA-PO2687

Is Albumin-Corrected Calcium Correct? The Impact of the Assay for Measuring Albumin Laura Labriola,¹ Wallemacq Pierre,² Beatrice Gulbis,³ Michel Jadoul.¹ ¹Nephrology, Cliniques Universitaires St-Luc; ²Analytic Chemistry, Cliniques Universitaires St-Luc, Brussels, Belgium; ³Medical Chemistry, Hopital Erasme, Brussels, Belgium.

Background: The K/DOQI guidelines recommend the use of albumin-corrected calcium (Ca), as well as phosphate, PTH and calcium-phosphate product (CaxP) as therapeutic targets. The two most common assays for measuring albumin yield discordant

results in uremic patients, with bromocresol purple (BCP) giving lower values of albumin than bromocresol green (BCG). Our aim was to assess the impact of the type of assay on corrected Ca and, thus, on reaching recommended K/DOQI targets for corrected Ca and CaxP.

Methods: We measured serum albumin (BCG and BCP), total Ca and phosphate in all our chronic hemodialysis (HD) patients. Total Ca was albumin-corrected by a formula proposed by the K/DOQI.

Results: We included 89 patients, aged 71.2 ± 11.5 years and on chronic HD for 29 (1-362) months. Albumin level is 3.78 ± 0.24 by BCG and 3.12 ± 0.27 g/dl by BCP ($p < 0.0001$). Using BCG there are 12 cases of "hypocalcaemia" (< 8.6 mg/dl), 3 cases of "hypercalcaemia" (> 10 mg/dl) and 74 cases with "normal" Ca. The corresponding albumin levels are 3.9 ± 0.2 ; 3.1 ± 0.6 et 3.8 ± 0.2 g/dl, respectively. Using BCP only one patient has "hypocalcaemia", 21 have "hypercalcaemia" et 67 have "normal" corrected Ca (albumin 3.1 ; 3 ± 0.3 et 3.2 ± 0.3 g/dl, respectively). Depending on the use of BCG or BCP, a discrepancy is thus observed in 29 cases (32.6%): 18 cases are classified as hypercalcaemia when albumin is measured by BCP but are considered normal using BCG, whereas 11 cases classified as hypocalcaemia with BCG have normal corrected Ca with BCP. Concerning CaxP, 7 discrepancies are detected.

Discussion and conclusion: The choice of either BCG or BCP has a major impact on albumin-corrected Ca and thus on reaching K/DOQI targets for Ca and CaxP. Clinicians should take it into account for the interpretation of laboratory values and the prescription of drugs and dialysate. The type of assay used for the measurement of albumin should also be recorded and its impact taken into account (or corrected) in multicentric studies and registries.

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SA-PO2688

Serum Calcium (Ca) and Phosphorus (P) Levels, Progression of Cardiovascular Calcifications (CC) and Survival in Peritoneal Dialysis (PD) Patients

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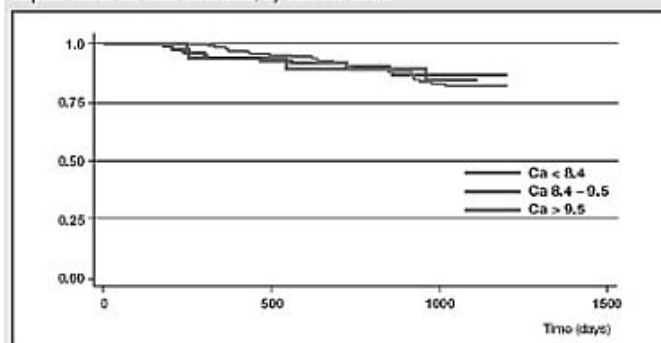
Hemodialysis patients are at increased risk of CC, but few data are available for PD patients. In a 3-year multicenter study in 335 PD pts we investigated progression of CC and the relationship between serum Ca and P levels and survival.

Ultrasound techniques were used to detect CC in 5 arteries and 2 cardiac valves. A score (0= no calcification to 7= all sites calcified) was defined based on the presence/absence of CC.

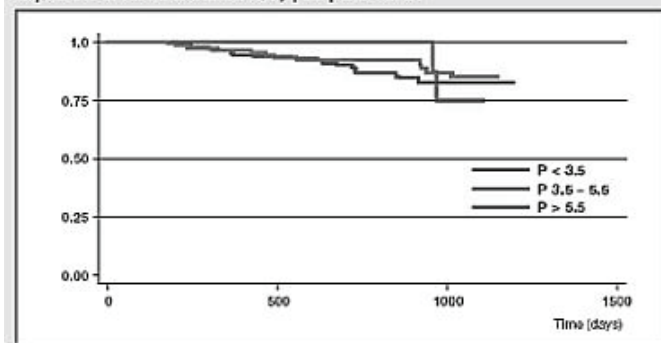
Mean $\pm$ SD age was 61 ± 14 years; dialysis vintage was 30 ± 25 months, males 56%, CAPD 54%, APD 44%. At baseline, prevalence of CC ranged from 33% to 46% and the mean global score was 2.8 ± 2.3 . Distribution of patients among score categories and its variation during the study were the following:

Baseline: score 0=24%; 1-2=28%; 3-4=21%; 5-6= 20%; 7=8%.
12 months: score 0=18%; 1-2=22%; 3-4=26%; 5-6= 25%; 7=10%.
24 months: score 0=14%; 1-2=25%; 3-4=22%; 5-6= 27%; 7=12%.
36 months: score 0=10%; 1-2=20%; 3-4=27%; 5-6= 28%; 7=16%.
We observed 42 deaths, not related to K-DOQI Ca and P categories.

Kaplan-Meier survival estimates, by calcium levels



Kaplan-Meier survival estimates, by phosphate levels



Similarly, the association of Ca and P with progression of CC was not statistically significant.

Our data demonstrate worsening of CC over 36 months in PD patients. Ultrasonography can be used to assess progression of CC. Further studies are needed to confirm these preliminary findings, which suggest serum Ca and P levels may not play a key role in predicting risk of death or progression of calcifications in PD patients.

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SA-PO2689

Blood Flow in Skin Microcirculation during Hemodialysis (HD) Depends on Calcium-Phosphate Metabolism

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Arterial blood pressure is followed as the parameter of intradialytic hemodynamic stability and only little attention is paid to microcirculation.

Using Laser Doppler Line Scanner (Moor Electronics, UK) we measured skin microcirculation in 35 hemodynamically stable HD patients (21m, 14f, 63 (36-83) years) on the dorsal parts of both hands. We evaluated 700 areas of interest (AIs) (10 on every hand) before and at 1, 2, 3, 4 hours interval during isothermic HD (constant ultrafiltration (UF) rate, average UF 650 (440-980) mL/hour, blood flow 300 mL/min, mean dBV = -9.8%, mean dEtot = -253kJ/HD). Average skin microcirculation measured after blowing the cuff above systolic pressure in 15 patients was used as critical value. Serum fetuin A (BioVendor, CZ) was assessed and calcium-phosphate product (CaxP) was calculated from pre-HD data. T-test and Spearman coefficient was used for statistical evaluation.

A decrease of skin perfusion below critical value was observed in 59% patients and in 24% of AI.

	Before	At 1 h	At 2 h	At 3 h	At 4 h
AIs +	6 (0.8)	47 (7)	88 (13)	124 (18)	163 (24)
Patients*	1 (3)	9 (26)	13 (37)	14 (40)	20 (59)

+ Number of AIs with critical blood flow (%), * number of patients with at least on AI with critical microcirculation (%).

CaxP was higher in patients with at least one AI under critical level, but median serum fetuin A did not differ (0,28 g/l in both subgroups).

	At 2 h	At 3 h	At 4 h
CaxP 1M	r=0.25; p=0.14	r=0.27; p=0.11	R=0.24; p=0.16
CaxP 3M	r=0.31; p=0.07	r=0.34; p=0.05	R=0.35; p=0.04
CaxP 6M	r=0.31; p=0.07	r=0.33; p=0.05	R=0.40; p=0.02

CaxP 1M, 3M, 6M- average values of CaxP counted from blood samples taken in last 1, 3, 6 months before skin microcirculation measurement. r- correlation coefficient. v value

Critical skin perfusion decrease observed during HD without symptoms of hemodynamic instability may be related to the long-term compensation of calcium-phosphate metabolism.

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