

Serum phosphate optimal timing and range associated with patients survival in haemodialysis: The COSMOS study

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Background. Serum phosphate is a key parameter in the management of chronic kidney disease-mineral and bone disorder (CKD-MBD). The timing of phosphate measurement is not standardized in the current guidelines. Since the optimal range of these biomarkers may vary depending on the duration of the interdialytic interval, in this analysis of the Current management of secondary hyperparathyroidism: a multicentre observational study (COSMOS), we assessed the influence of a 2- (midweek) or 3-day (post-weekend) dialysis interval for blood withdrawal on serum levels of CKD-MBD biomarkers and their association with mortality risk. **Methods.** The COSMOS cohort (6797 patients, CKD Stage 5D) was divided into two groups depending upon midweek or post-weekend blood collection. Univariate and multivariate Cox's models adjusted hazard ratios (HRs) by demographics and comorbidities, treatments and biochemical parameters from a patient/centre database collected at baseline and every 6 months for 3 years. **Results.** There were no differences in serum calcium or parathyroid hormone levels between midweek and post-weekend patients. However, in post-weekend patients, the mean serum phosphate levels were higher compared with midweek patients (5.5 ± 1.4 versus 5.2 ± 1.4 mg/dL, $P < 0.001$). Also, the range of

serum phosphate with the lowest mortality risk [HR ? 1.1; midweek: 3.5-4.9 mg/dL (95% confidence interval, CI: 2.9-5.2 mg/dL); post-weekend: 3.8-5.7 mg/dL (95% CI: 3.0-6.4 mg/dL)] showed significant differences in the upper limit (P = 0.021). Conclusion. Midweek and post-weekend serum phosphate levels and their target ranges associated with the lowest mortality risk differ. Thus, clinical guidelines should consider the timing of blood withdrawal when recommending optimal target ranges for serum phosphate and therapeutic strategies for phosphate control. © 2018 The Author(s).

calcaemia

chronic haemodialysis

epidemiology

hyperparathyroidism

phosphataemia

albumin

biological marker

calcium

hemoglobin

parathyroid hormone

phosphate

biological marker

calcium

parathyroid hormone

phosphate

adult

albumin blood level

all cause mortality

Article

blood sampling

body mass

calcium blood level

chronic kidney disease-mineral and bone disorder

clinical assessment

cohort analysis

comorbidity

female

hemodialysis

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human

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middle aged

mortality risk

multicenter study

observational study

parathyroid hormone blood level

phosphate blood level

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blood

chronic kidney disease-mineral and bone disorder

clinical trial

hemodialysis

mortality

prognosis

randomization

secondary hyperparathyroidism

survival rate

Biomarkers

Calcium

Chronic Kidney Disease-Mineral and Bone Disorder

Female

Humans

Hyperparathyroidism, Secondary

Male

Middle Aged

Parathyroid Hormone

Phosphates

Prognosis

Prospective Studies

Random Allocation

Renal Dialysis

Survival Rate