FGF23 CLEARANCES IN PERITONEAL DIALYSIS

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OBJECTIVES

Fibroblast growth factor (FGF23) plays an important role in mineral bone metabolism and maintaining phosphate haemostasis. It is one of the strongest independent prognostic factors predicting outcome.

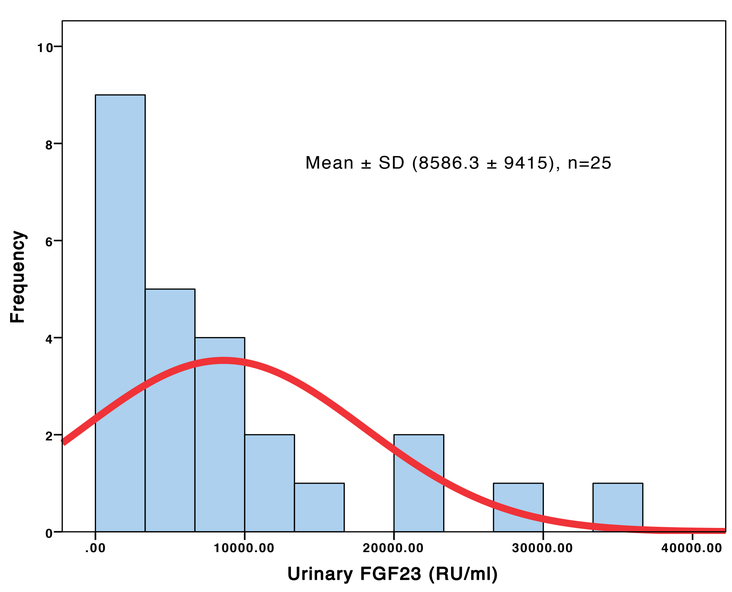
The aim of this study was to understand the effect of residual renal function and treatment with peritoneal dialysis (PD) on the clearances of FGF23. The variability of FGF23 over time was also examined.

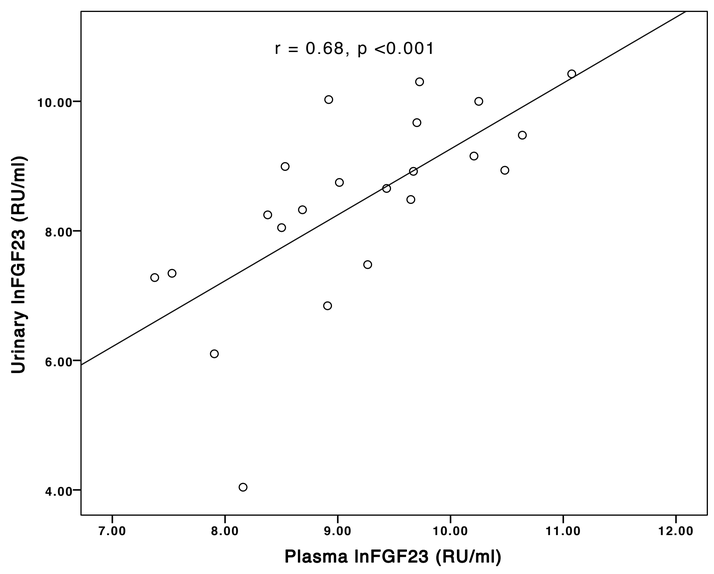
METHODS

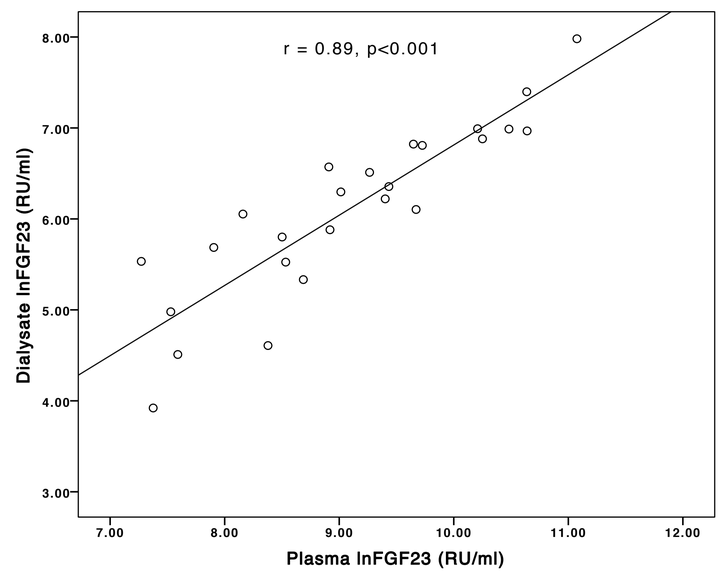
Adult patients with end-stage renal disease (ESRD) on peritoneal dialysis and no planned change in modality of renal replacement therapy (RRT) over a 9 month period were included. FGF23 and phosphate levels were measured from plasma and 24-hour collections of urine and dialysate at 0 (start), 3, 6 and 9 months (end of the study). Serial dilutions (plasma) and concentrations (dialysate) of FGF23 was performed as necessary and measured in duplicate using second-generation C-terminal assays (Immutopics Inc., San Clemente, CA, USA). FGF23 clearance was calculated.

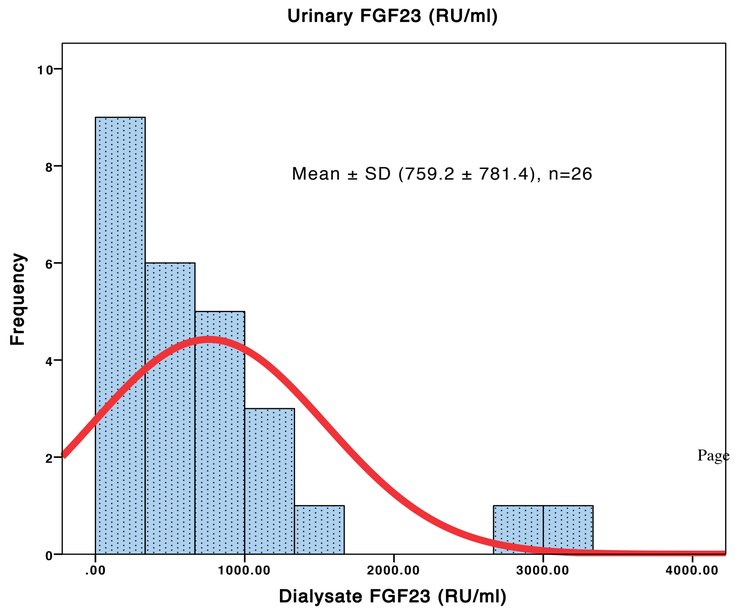
RESULTS

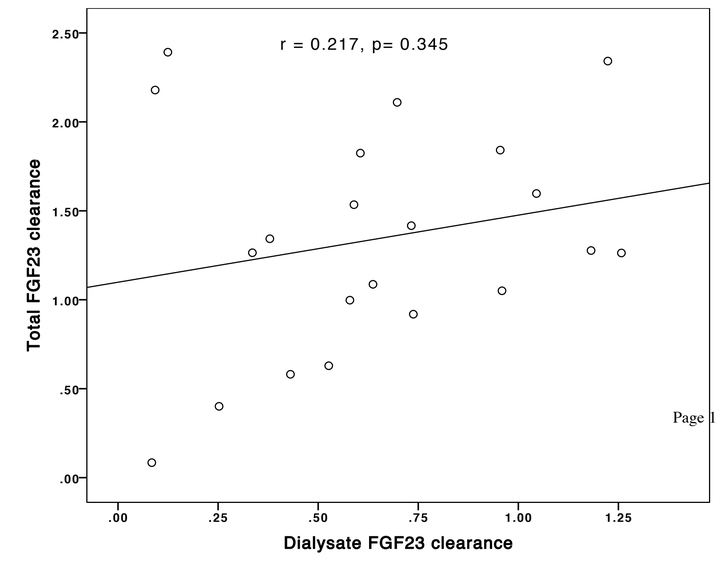
19 patients were identified (11 F, 8 M). Average age was 59.2 years (26.7-84.3), with mean RRT and PD vintage of 4.0 and 2.8 years. Plasma phosphate concentration was normally distributed while FGF23 levels were positively skewed . Across all time periods there were 58 measurements of both FGF23 and phosphate taken at the same time.

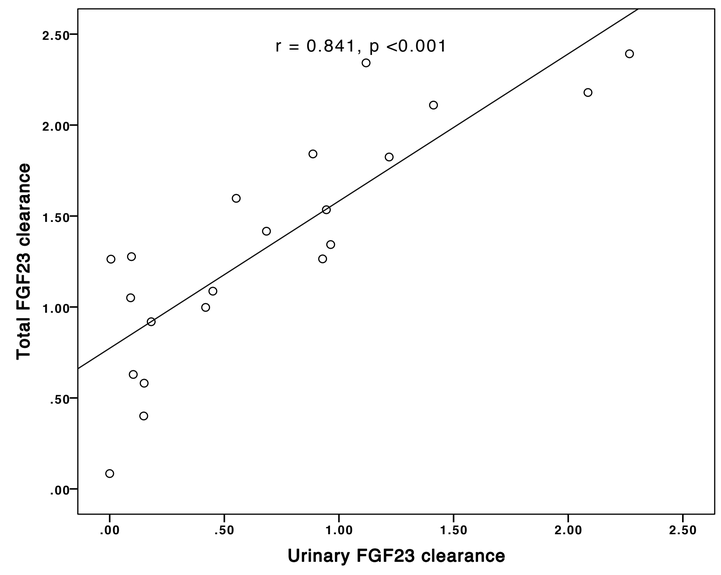




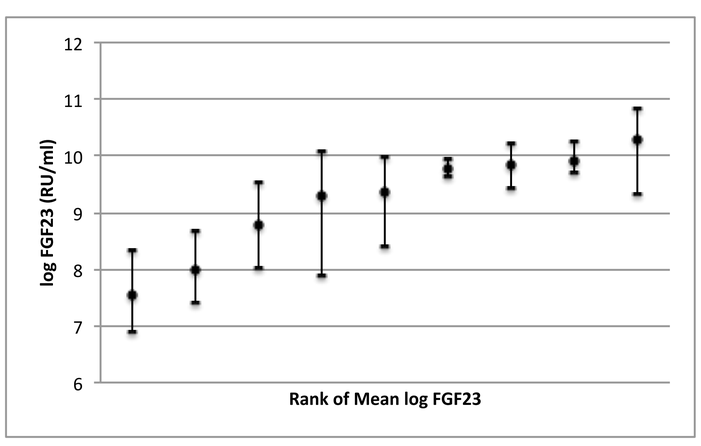






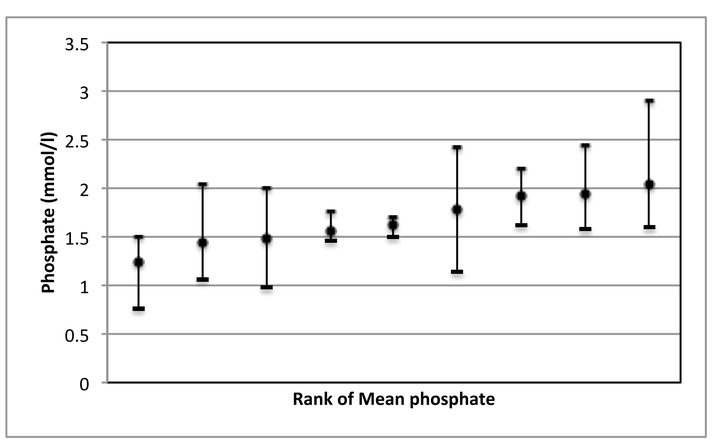


There was a significantly positive correlation of plasma FGF23 with serum phosphate, urinary FGF23 and dialysate FGF23. The strong correlation of urinary FGF23 clearance to total FGF23 clearance and a moderately negative, non-significant correlation to dialysate FGF23 clearance suggests that residual renal function is an important determinant of FGF23 clearances.



In 9 patients with 3 repeated measures the within subject means and variation were rank ordered for individual patients to calculate intraclass correlation coefficient (ICC).

A high ICC indicates greater stability over time in repeated measures as most of the variability is due to between subject variability. ICC for FGF23 was 0.90 while for phosphate this was 0.63.



CONCLUSIONS

FGF23 is significantly raised in patients with ESRD on PD and is associated with hyperphosphatemia. Residual renal function is an important determinant of FGF23 clearance. FGF23 may be an additional reliable marker with more stability over time to study disordered phosphate metabolism.

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