

V Dey<sup>1</sup>, K Stevens<sup>2</sup>, D Hillyard<sup>2</sup>, A Jardine<sup>2</sup>, E Spalding<sup>1</sup>

<sup>1</sup> Renal Unit, University Hospital Crosshouse, Kilmarnock, UK <sup>2</sup> Cardiovascular & Medical Sciences, University of Glasgow, Glasgow, UK

## INTRODUCTION

Fibroblast growth factor (FGF23) maintains phosphate haemostasis by promoting phosphaturia. It is an independent predictor of mortality with levels 1000 fold higher in patients on dialysis.

## OBJECTIVE

The aim of this study was to examine the correlation of phosphate to FGF23 during dialysis and the relative effectiveness of haemodialysis and haemodiafiltration in FGF23 removal.

## METHODS

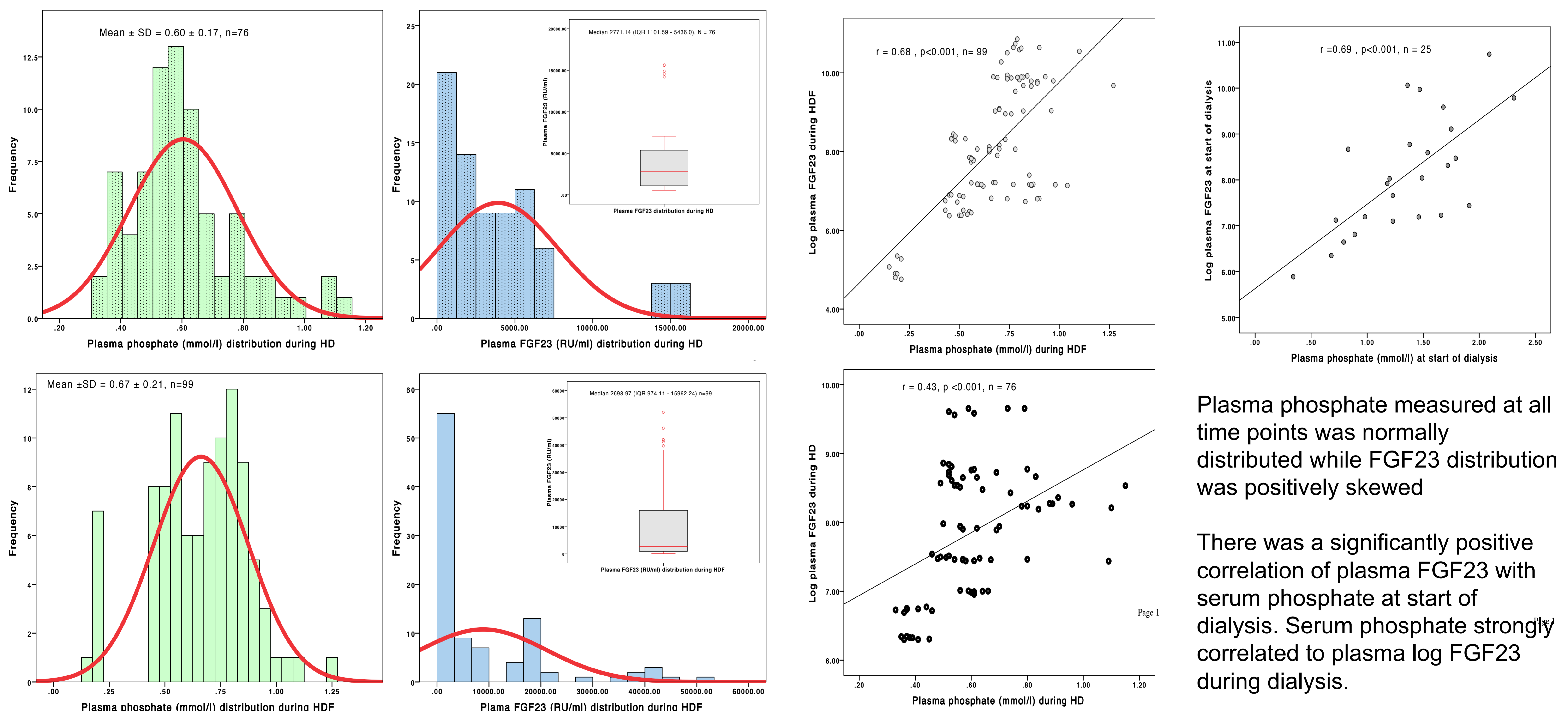
25 adult patients from 2 different centres, 14 on haemodiafiltration (HDF) and 11 on high flux dialysis (HD) participated. Blood samples were collected at start (t<sub>0</sub>), equally timed intervals during dialysis (t<sub>1</sub>, t<sub>2</sub>, t<sub>3</sub>, t<sub>4</sub>, t<sub>5</sub>, t<sub>6</sub>) and at the end of treatment (t<sub>7</sub>). All patients had working fistulae with no evidence of recirculation (<5%). Patients were not severely malnourished or hospitalised. FGF23 samples were centrifuged within 4 hours of collection (t<sub>1/2</sub> of 46 ± 12 minutes) and frozen at -80°C. Serial dilutions were performed and measured in duplicate using second-generation C-terminal assays (Immutopics Inc., San Clemente, CA, USA).

Data is expressed as mean and standard deviation (SD) or median and inter quartile range (IQR). Correlations were studied using linear regression analysis. Pre and post dialysis FGF23 were compared using non-parametric Wilcoxon test. P values of < 0.05 were considered statistically significant. Post dialysis FGF23 concentrations were corrected for haemoconcentration with a single pool kinetic model

$$[FGF23_{corrected} = FGF23_{post} / [1 + \Delta BW / (0.2 \times BW_{post})]]$$

Where ΔBW is the difference between pre and post dialysis treatment weight and BW post the post dialysis body weight.

## RESULTS



Plasma phosphate measured at all time points was normally distributed while FGF23 distribution was positively skewed

There was a significantly positive correlation of plasma FGF23 with serum phosphate at start of dialysis. Serum phosphate strongly correlated to plasma log FGF23 during dialysis.

During HDF median FGF23 decreased from 2906.1 RU/ml (IQR 1307.4 - 18678.3) to 2608.7 (IQR 1212.0 - 5802.2), p = 0.002, n = 13; For HD median values fell from 3113.54 RU/ml (IQR 1212.0 - 5802.2) to 2461.9 RU/ml (IQR (958.3-5438.9), p = 0.003, n = 11

## CONCLUSIONS

Plasma FGF23 levels strongly correlate to phosphate before and during a session of dialysis. Haemodialysis (HD or HDF) is an effective treatment in reducing FGF23 levels. Further kinetic studies should be undertaken to examine the elimination of FGF23 during dialysis.

