

Renal calcification in hypoparathyroid patients treated with calcium and vitamin D: Can biochemistry help?

Pathmanathan Sivatharshya¹, Scott Tolhurst², Emma Illingworth¹, Claire Higham¹, Peter J Trainer¹, Phillip J Monaghan²

Hospital ¹Department of Endocrinology, The Christie NHS Foundation Trust. ²The Christie Pathology Partnership, The Christie NHS Foundation Trust, Manchester M20 4BX, UK.

Objectives

- To assess whether serum and urine biochemical parameters are associated with the presence of renal calcification in hypoparathyroid patients on Alfacalcidol therapy.
- To establish if the spot urine calcium:creatinine method can be adopted as the main biochemical urine prognostic and monitoring test method.

Methods

Approval for all ethical and health and safety issues in the project was obtained from The Christie Trust clinical audit committee.(Reference CE14/1353)

The patients diagnosed with hypoparathyroidism or primary hypoparathyroidism and had received Alfacalcidol (Vitamin D) replacement therapy and receiving care in the Endocrine department of the Christie Hospital were included in the study.

The study period focused on was a 12 month audit of the laboratory database of paired requests for 24-h urine calcium (24h-Ca), spot calcium:creatinine ratio (Ca:Creat), serum calcium, phosphate, urea and creatinine.

A review of case notes was performed to confirm aetiology of hypoparathyroidism, Alfacalcidol dose, duration of therapy and results of renal ultrasound scan (USS).

Results

A total of 34 patients were identified as having hypoparathyroidism and receiving Alfacalcidol therapy.

24h-Ca and Ca:Creat were not normally distributed, however significant associations were found between 24h-Ca and Ca:Creat when log-transformed (linear regression b-coefficient = 0.64; 95% CI 0.36 to 0.92; p<0.001, β = 0.63).

17 patients had documented hypercalciuria evidenced by elevated 24h-Ca (5 patients), Ca:Creat (8 patients) or both (4 patients). 13 patients had undergone renal USS; 4 had evidence of renal calcification. Interestingly, these 4 patients each had an elevated Ca:Creat, in contrast with only one patient having elevated 24h-Ca.

No patient had hypercalcaemia. However, 20 patients had low, or low-normal serum adjusted calcium (Ca < 2.2 mmol/L); 9 of these patients having documented hypercalciuria evidenced by an elevated 24h-Ca (78% of patients) or Ca:Creat (89% of patients).

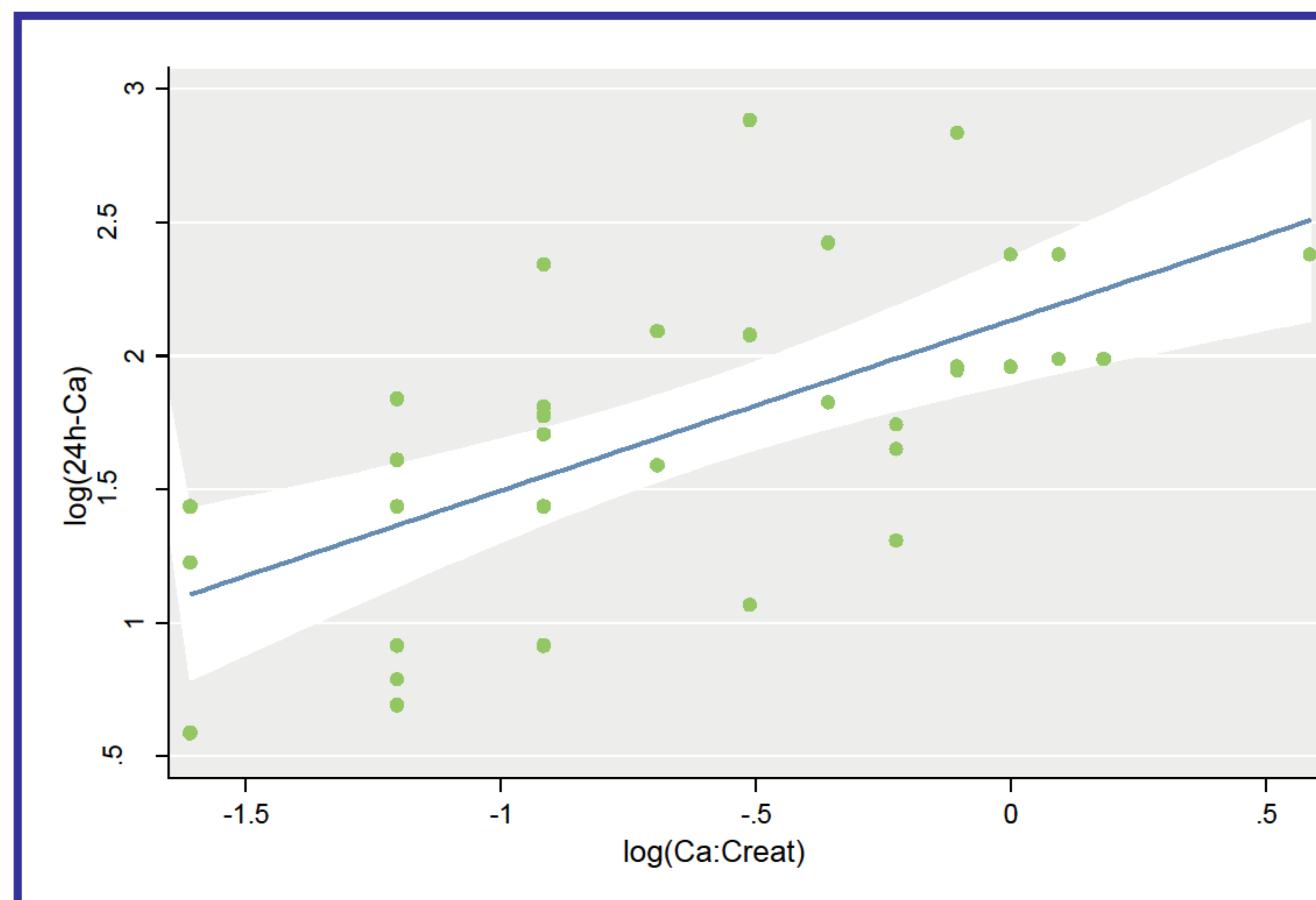


Figure 1
Scatter plot showing the relationship between log(Ca:Creat) and log(24h-Ca). A regression fit line is shown as well as 95% confidence interval.

Conclusions

Ca:Creat ratio appears a sensible and convenient marker for the follow-up of patients on long term Alfacalcidol therapy to determine associated risk of renal calcification.

References

- Gokce, C., Gokce, O., Baydinc, C. et al. (1991). Use of random urine samples to estimate total urinary calcium and phosphate excretion. Arch Intern Med, 151, pp.1587-1588.
- Hong, Y., Dublin, N., Razack, A., Mohd, M. and Husain, R. (2010). Twenty-four Hour and Spot Urine Metabolic Evaluations: Correlations Versus Agreements. Urology, 75(6), pp.1294-1298.
- Jones, A. and Hansen, K. (2010). A Moratorium on the Spot Urine Calcium-to-Creatinine Ratio. Urology, 76(4), pp. 1021-1022.

