**A retrospective audit examining bone parameters in haemodialysis patients in relation to prescribed phosphate binders and active vitamin D analogues**

**Background**

Our renal multi-disciplinary team (MDT) monitor pre-dialysis calcium, phosphate & parathyroid levels (PTH) quarterly in all our haemodialysis (HD) patients and assess these against the 2010 Renal Association (RA) Chronic Kidney Disease [- Mineral and Bone Disorders (CKD-MBD)](https://renal.org/wp-content/uploads/2017/06/ckd-mineral-and-bone-disorders-ckd-mbd204ca231181561659443ff000014d4d8.pdf) guidelines. The audit presented here focused on a sub-group of satellite dialysis patients (n = 75), and examines correlations between bone parameter levels, and phosphate binder/vitamin D receptor activators (paricalcitol, calcitriol, and alfacalcidol) (VDRa) use.

**Aims:**

1. To assess serum phosphate, corrected calcium and intact parathyroid levels in relation to phosphate binder and VDRa use

2. To investigate whether potential changes in practice could improve performance against RA CKD-MBD guidelines.

**Method**

Retrospective data looking at 75 satellite HD patient’s bone parameters from May 2017 (serum phosphate (PO4), corrected calcium (Ca+) and intact parathyroid (iPTH) levels) was extracted from the Trust’s clinical reporting systems. The type and dose of the patients’ prescribed phosphate binders and VDRa were recorded.

**Results**

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| --- | --- | --- | --- | --- |
| **Bone parameter** | **Target range** | **Below target range** | **Within target range** | **Above target range** |
| **Ca+**  **(mmol/L)** | **2.2-2.5** | 23% (n = 17) | 76% (n = 57) | 1% (n = 1) |
| **PO4**  **(mmol/L)** | **1.1-1.7** | 12% (n = 9) | 55% (n = 41) | 33% (n = 25) |
| **iPTH**  **(pmol/L)** | **8-38** | 11% (n = 8) | 60% (n = 45) | 29% (n = 22) |

*Table 1. Summary of patients’ bone parameters in relation to the 2010 RA CKD-MBD guidelines. Results reported as percentage and number of patients.*

36% (n = 27) of patients had a PO4 level above the upper RA target of 1.7mmol/L in May 2017. 24% of the patients with hyperphosphataemia were not prescribed a phosphate binder. 50% of patients that were prescribed a calcium containing phosphate binder (n =17), and 24% of the patients that were prescribed a non-calcium containing phosphate binder (n =3) had a serum PO4 phosphate level greater than 1.7mmol/L. 68% (n =15) of patients with a serum iPTH above the RA target (2-9 times the upper local laboratory range), had low or well controlled Ca+ levels suggesting an increase in VDRa is needed.

**Discussion**

Hyperphosphataemia and secondary hyperparathyroidism are common within the group of HD patients reported here. This is a known problem in HD patients throughout the UK. Reasons for increased PO4 and iPTH levels include but are not limited to; non-adherence with diet and/or medications, insufficient phosphate binders prescribed, poor dialysis adequacy, lack of patient education/understanding. These results have been presented to our renal MDT and the importance of maximising phosphate binder, and VDRa therapy has been highlighted.

**Conclusion**

Further audits at the main and other satellite HD units are required to fully understand the reflection of these results across our whole HD population. A repeat audit is planned to investigate if improvements in practice and subsequently results will follow. Renal dietitians are well placed to help improve communication with the Nephrologist and HD nurse, regarding necessary adjustments in diet and medications.