The Renal Association
UK Renal Registry

Biochemical Variables Amongst UK Adult Dialysis Patients in 2014

Lay summary

For the full annual report chapters click here or visit https://www.renalreg.org/reports/2015-eighteenth-annual-report/

The UK Renal Registry (UKRR) collects routine biochemical data from clinical information systems in renal centres in England, Wales and Northern Ireland and receives data from Scotland via the Scottish Renal Registry. Annual analyses are done on some of these data items to determine centre level performance against national (Renal Association (RA)) clinical performance measures. This enables renal centres to compare their own performance against each other and to the UK average performance. The full chapter also includes longitudinal analyses which show whether there have been changes over time.

The full chapter reports on phosphate, adjusted calcium, parathryoid hormone (PTH) and bicarbonate levels for people on dialysis (haemodialysis (HD) or peritoneal dialysis (PD)). Completeness of data returns to the UKRR was generally good for these data items. Data were analysed for the stable group of people who had been receiving the same type of dialysis at the same renal centre for at least three months. All results are unadjusted for case-mix.

Figure 1 shows the percentage of patients meeting the target for phosphate by year and dialysis type. It also shows the percentage of people who were either above or below the target range. For 2014, 57.5% of HD and 62.7% of PD patients achieved the audit measure and 29.0% of HD and 30.3% of PD patients were above the audit standard range.
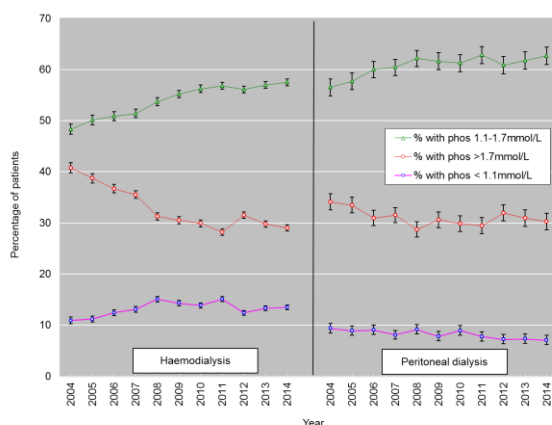

Figure 1 Longitudinal change in percentage of patients with phosphate below, within and above the 2010 RA standard by dialysis modality 2004–2014

In 2014, 79.1% of HD and 79.7% of PD patients had adjusted calcium between 2.2–2.5 mmol/L. For serum PTH, 57.4% of HD and 65.0% of PD patients had values within 16–72 pmol/L.

The chapter also looks at the simultaneous control of all three of the bone and mineral disorder (BMD) parameters. For the purpose of these analyses an adjusted calcium between 2.2–2.5 mmol/L, a phosphate level being maintained at or below 1.7 mmol/L and a PTH level being at or below 72 pmol/L, were evaluated in combination. Simultaneous control of all three parameters within these ranges was achieved by 50.3% of HD and 52.5% of PD patients. Figure 2 shows the funnel plot of this information for people receiving HD treatment. Each centre's percentage is shown by a white dot and these are plotted against the number of people the centre has on HD. The thick dotted line shows the average achievement (50.3%) and the red curved lines (funnels) give a measure of where you would expect most centres to fall within. Some will fall outside these curves by random chance but the plot allows you to see the variability between centres and whether any have markedly lower or higher percentages than the others. If this is the case, as for example for the centre with about 800 patients and a percentage of about 37, this can be investigated. There are many possible reasons for such differences, for example, there may be problems with the data transfer, differences in assays used, differences in the patient's characteristics or differences in the use of drugs.
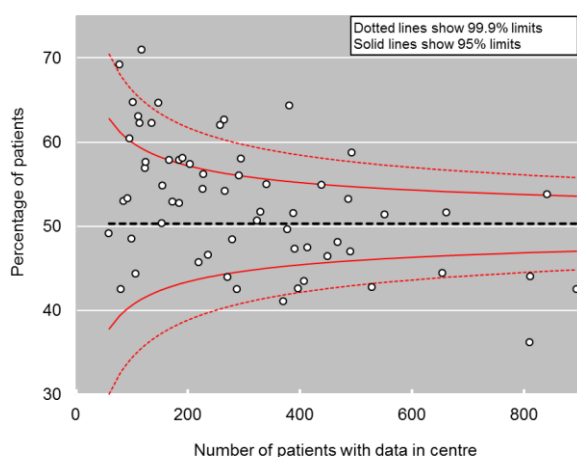

Figure 2 Funnel plot for percentage of patients on HD achieving simultaneous control of all three BMD parameters in preventing severe hyperparathyroidism by centre in 2014

Serum bicarbonate levels have not changed markedly over time with 60.4% of HD and 81.8% of PD patients achieving the audit measure for bicarbonate in 2014. A persistent percentage of HD patients remain with raised bicarbonate levels.

Audit measures for kidney disease increasingly include tighter specification limits in conjunction with a growing evidence base. Out of target range observations (e.g. hyperphosphataemia and hypophosphataemia) need to be interpreted cautiously as they may relate to different clinical problems or population characteristics. These will therefore require different strategies to improve centre performance of clinical audit measures.

There was ongoing improvement in achieving measures of bone and mineral disease management (BMD). In order to optimise BMD control further, it is necessary to explore more fully, for example, to consider a number of case mix factors. To do this the UKRR needs an enhanced dataset from each centre. Many centres are updating their IT systems, with an ambition that all new developments will comply with the National Renal Dataset. Thus, in future analyses, it may be possible to integrate details of assays used for the biochemical parameters, the local reference ranges adhered to, the dialysis dose and dialysate concentrations prescribed, as well as accessing all details of phosphate binder, calcium mimetic and vitamin D analogue use.