

Nutritional and biochemical outcomes in the pre-dialysis stage of Chronic Kidney Disease: a comparison of two UK renal units

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Introduction: Once patients with Chronic Kidney Disease (CKD) commence dialysis, NICE guidelines recommend regular dietetic input (NICE, 2018). The provision of dietetic services pre-dialysis varies between UK renal units. This service evaluation compared nutritional and biochemical outcomes from two pre-dialysis services; Hospital X (HX), with access to a renal dietitian at each patient's appointment, and Hospital Y (HY), with limited access to a renal dietitian.

Methods: Data was collected retrospectively for all patients who commenced dialysis in 2018. Measurements included plasma potassium, plasma bicarbonate, plasma phosphate, body mass index (BMI), weight change, oral nutritional supplements and medications (phosphate binders, sodium bicarbonate and anti-hypertensives). Data was collected at three nephrology appointments: in the two months prior to starting dialysis (C1), at 6 months prior to dialysis (C2) and at 12 months prior to dialysis (C3).

Results: Data was collected for 57 patients at HX and 62 patients at HY. Patients saw the renal dietitian significantly more at HX in the year prior to dialysis than at HY (mean number of contacts at HX 3.8, compared to 0.1 at HY, $p < 0.001$). There was no difference in BMI or weight change between the two units, though more oral nutritional supplements were prescribed at HX at C1 ($p < 0.05$).

HY had a significantly lower mean potassium result at C1 (K 5.1mmol/L at HX, K 4.8mmol/L at HY, $p = 0.02$), C2 (K 5.3mmol/L at HX, K 4.8mmol/L at HY, $p < 0.001$), and C3 (K 5.2mmol/L at HX, K 4.7mmol/L at HY, $p < 0.001$). HY had significantly higher usage of sodium bicarbonate at time points 1, 2 and 3 ($p < 0.01$, $p = 0.03$, $p < 0.01$ respectively) with a significantly higher dose at each point ($p = 0.001$, $p < 0.01$, $p = 0.001$ respectively). Mean phosphate was lower at HY at C2 (P 1.67mmol/L at HX, P 1.47mmol/L at HY, $p < 0.01$). There was no difference in the number of patients on phosphate binders at any point.

Discussion: These results should be interpreted with caution. The service evaluation did not include patient-related experience measurements (PREMS), which would have allowed assessment of the quality of dietary advice.

Despite minimal dietetic input, patients at HY had lower potassium and phosphate results. This was not accompanied by a lower mean BMI or greater weight loss. Weight is a poor marker of nutritional status in this population due to possible fluid retention. Although efforts were made to account for fluid overload retrospectively, this was subjective and open to error. Collecting Subjective Global Assessment (SGA) and handgrip strength would have improved this project, but was not routinely completed by either unit.

There are multiple possible explanations why patients at HY had lower mean potassium levels, such as differences in sodium bicarbonate use, timing of starting dialysis, or varying protocols and targets. This service evaluation shows that we should not rely solely on biochemical parameters to measure

effectiveness of renal dietetic input. Further research is needed to investigate the outcomes of individualised renal dietetic advice.