Various studies show signs of malnutrition in 23-76% of haemodialysis (HD) patients and 18-50% of peritoneal dialysis (PD) patients.
The renal population often have a reduced body weight, depleted energy stores, loss of somatic protein and low levels of serum albumin...
Increased nutrient losses

Patients who receive maintenance dialysis experience a loss of nutrients as a direct result of dialysis. HD results in a loss of 6-12g amino acids, 2-3g peptides and negligible amounts of protein per dialysis session. During PD, patients lose only 2-4g amino acids, but experience a loss of 8-9g protein per day (including 5-6g albumin). Patients on PD can lose over 15g protein each day during periods of peritonitis. This increase protein losses can last for several days after the peritonitis is treated.

Patients receiving maintenance dialysis also have protein losses due to frequent blood sampling for labs. A patient with normal haemoglobin will lose approximately 8g protein with each 100mls of blood removed.

Increased catabolism

Patients with renal failure are frequently ‘anabolism challenged’. The increased acute phase reactants observed with renal failure and dialysis inhibits hepatic production of albumin and increased catabolism of skeletal muscle tissue. Acidosis is an additional factor that precipitates catabolism in this population. Provision of bicarbonate to maintenance dialysis patients decreases the protein catabolic rate and improves nutritional status.

Protein requirements

Protein requirements for patients with chronic kidney failure are dependent on the acute or chronic nature of the renal failure and the presence and type of dialysis. The nutritional status and adequacy of current intake of the patient should also be considered. A reduced protein intake may decrease urea clearance and delay the need for dialysis in a stable patient with chronic renal insufficiency. However, a reduced protein intake is not advisable in the setting of significant malnutrition or inadequate calorie intake.

Protein requirements for patients receiving dialysis are increased above requirements for healthy adults. HD and PD increase nitrogen losses. In addition, there is information that HD is an inflammatory and catabolic process. The European guideline is 1.2-1.3g protein/kg/day for stable haemodialysis patients and 1.2-1.5g protein/kg/day for stable PD patients.

Energy intake

Energy intake is also critical in dialysis patient. Several studies have demonstrated that the energy requirements in these patients are not different from adults. HD and PD increase nitrogen losses. In addition, there is information that HD is an inflammatory and catabolic process. The European guideline is 1.2-1.3g protein/kg/day for stable haemodialysis patients and 1.2-1.5g protein/kg/day for stable PD patients.

Nutritional intervention

The frequent occurrence of malnutrition in patients with renal failure and the consistent association between markers of malnutrition and poor outcomes in this population emphasise the need for appropriate and timely intervention. Patients with CKD provide the dietitian with additional challenges of providing nutritional support with confinities of fluid and any phosphate or potassium restrictions. Dietary supplements have the advantage of being fairly easily accepted and simple to administer. Several of the available supplements have been formulated specifically for renal patients. It is recommended that supplements are energy and protein dense and low in phosphate within a low volume. A large retrospective analysis of dietary supplements in dialysis patients demonstrated that their use was associated with an increased serum albumin level in those patients, as well as increases in body weight and anthropometry measures. However, despite these results, many patients are not compliant with the use of supplements. This may be because of the fluid volume, monosity, or they may be unpalatable to the patient. It is important that the supplements prescribed are selected appropriately and that patients be carefully monitored for compliance.

If oral supplements cannot be tolerated, tube feeding should be considered. In practice, tube feeding can be very effective in improving nutritional status in malnourished patients. Patients who require extended nutrition support may be appropriate for long-term feeding access, such as a percutaneous endoscopic gastrostomy (PEG). Peritoneal dialysis is generally contraindication to PEG placement due to the risk of peritonitis. There is limited randomised data specific to maintenance HD patients receiving PEG feeding. Cohort data suggests that PEG feeds are safe and effective in patients receiving long-term HD.

Conclusion

Although a large body of evidence exists to demonstrate that increasing intake will improve measures of nutritional status, no studies exist to determine whether provision of additional protein and calories to reach the target recommendations will change the outcomes of mortality and morbidity. No randomised, perspective or controlled trials have been carried out to examine this question. However, the benefits of an adequate diet would seem to outweigh the potential risk of over feeding. The main risk of increasing protein and energy intake is that every effort should be made to ensure that patients consume an adequate diet which may require a relaxation of some of the usual dietary restrictions. It also requires an effort by the dietitian to help patients understand their requirements and remain sensitive to patient’s ethnic food habits. These efforts should result in well nourished patients, as well as improved patient outcomes.

References:
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