Nutrition and Chronic Kidney Disease

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This article is the seventh of a series about chronic kidney disease and its management based on the new National Kidney Foundation guidelines. If you missed previous articles in this series, please log onto the IHS website. Archived issues are found at the Clinical Support Center's web page.

Why worry about nutrition in chronic kidney disease?

Malnutrition increases morbidity and mortality for patients starting dialysis. Inadequate protein and calories result in the malnutrition seen in chronic kidney disease (CKD). Anorexia due to uremia, altered taste sensation, catabolism, metabolic acidosis, and decreased functional status are but a few of the factors relating to this malnutrition.

Who should be assessed for malnutrition?

Patients at Stage 3 and higher (glomerular filtration rate ≤ 60 mL/min/1.73 m^2) should be referred for nutritional assessment by a registered dietitian (RD). The RD can assess current intake, make recommendations, and monitor for changes in nutritional status.

For those with glomerular filtration rates < 20 mL/min/1.73 m^2, the evaluation should include at least *one value from each* of the following clusters:

1. Serum albumin
2. Edema-free actual body weight, percent standard (NHANES II) body weight, or subjective global assessment ((SGA); and
3. Normalized protein nitrogen appearance (nPNA) or dietary interviews and diaries

Protein recommendations (KDOQI)

Protein restriction should be considered for patients with GFR < 25 mL/min/1.73m^2 (Stage 4). Patients should consume no more than 0.6 grams of protein/kilogram/day. If the patient cannot or will not tolerate this level, use 0.75 g protein/kg/d. At least 50% of the protein should be obtained from high quality protein sources.

Controversy exists regarding dietary protein and its effect on Stages 1 - 3 (GFR 30 and above). Lower protein consumption was not found to delay the progression of CKD in the Modification of Diet in Renal Disease study. However, subsequent meta-analyses indicate that protein restriction may slow progression. KDOQI guidelines state "there is insufficient evidence to recommend for or against routine prescription of dietary protein restriction for the purpose of slowing the progression of chronic kidney disease; individual decision-making is recommended, after discussion of risks and benefits." Although the advisability of restricting protein to < 0.6 g is uncertain, even achievement of 0.6 - 0.8 g/kg intake in fact reflects a decrease in protein intake for most Americans.

Calorie recommendations (KDOQI)

Adequate calories are needed to maintain nutritional status. Recommended caloric intake for patients with GFR < 25 mL/min/1.73 m^2 (Stage 4) is based on age, as follows:

- Under age 60, use 35 kilocalories/kilogram/day (kcal/kg/d)
- Over age 60, use 30 - 35 kcal/kg/d.

Sodium recommendations (American Dietetic Association)

Sodium is involved in fluid balance. Patients who are indiscreet with sodium intake may have edema and elevated blood pressure. KDOQI does not address sodium restriction. The American Dietetic Association's National Renal Diet recommends 1000 - 3000 mg of sodium per day for patients with CKD. Patients should be counseled to avoid table salt in cooking and at the table. Processed foods including canned soups, canned vegetables, and canned meats are high in sodium and should be limited.

Phosphorus and Calcium Recommendations (KDOQI)

Phosphorus and calcium are involved in the metabolic bone disease seen in CKD. Their imbalance places the patient at increased risk for calcification of soft tissues and appears to be involved in increased rates of cardiovascular mortality. Phosphorus binding medications are routinely prescribed to help control phosphorus. These minerals become an issue early in the progression of CKD, at Stage 2 (GFR about 60 - 80 mL/min/1.73m^2). Serum levels of phosphorus and calcium appear "normal." However, parathyroid hormone levels increase and Vitamin D levels most likely decrease. It is their imbalance that sets the stage for bone disease.

A future article will specifically address bone disease and its treatment. □