Nutritional Screening and Assessment in Chronic Kidney Disease

By Guillermina Barril and Mar Ruperto

Nutritional risk and malnutrition related to chronic kidney disease (CKD) are common disorders that usually appear from CKD stages 3–5 and are more frequent among patients undergoing renal replacement therapy, mainly among those receiving hemodialysis therapy.

The prevalence of malnutrition has been reported in up to 54% of patients living with CKD, leading to a significant increase in morbidity and mortality (1–3). Nutritional screening is a preassessment method of nutritional status to identify patients at risk of malnutrition and, in turn, to indicate nutritional assessment for those with increased nutritional risk and/or probable malnutrition. Since the 1980s, several nutritional screening tools have been implemented in CKD (Figure 1).

The subjective global assessment (SGA), originally developed by Detsky and colleagues in the 1980s (4), was adapted and validated in 1996 as a seven-point scale (7-point SGA) (5, 6). Recommended by clinical practice guidelines for regular nutritional assessment in patients with CKD and undergoing dialysis (7), this 7-point SGA is based on clinical history data (body weight, dietary intake, gastrointestinal symptoms, and functional capacity, as well as comorbidities related to nutritional needs) and includes a physical examination of body mass (subcutaneous fat and muscle) and the detection of edema. Studies (8, 9) have shown that low 7-point SGA scores are associated with a high risk of mortality in patients living with CKD and undergoing dialysis. In 1999, the dialysis malnutrition score (DMS) was developed (10), which used the original 7-point SGA scale and included a score from 1 to 5 for each item. Subsequently, the Malnutrition-Inflammation Score (MIS) questionnaire, a semiquantitative tool that is based on the subjective 7-point SGA and also includes objective parameters (body mass index, serum albumin, and total iron binding capacity) (11), has been extensively correlated in previous studies (11, 12) with hospital admission and mortality. MIS is a validated nutritional screening tool for patients with CKD and undergoing dialysis. A single marker by itself is not able to identify or diagnose nutritional disorders.

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Figure 1. Timeline of nutritional screening tools and diagnostic criteria used in populations with CKD and undergoing dialysis

Conceptual scheme modified from Hanna et al. (15). GFR, glomerular filtration rate.

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dividuals with chronic kidney disease (CKD) and those receiving kidney replacement therapies are often prescribed diets that are extremely challenging to adhere to. In addition to being low in phosphorus, these diets typically are restrictive in potassium (K⁺)-containing foods. The rationale for K⁺ restriction among this patient population was derived years ago and was based on K⁺-restrictions in diets, which provide 2000 mg per day—exactly what a patient takes in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribed low K⁺ diets, which provide 2000 mg per day—exactly what consumers take in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribed low K⁺ diets, which provide 2000 mg per day—exactly what consumers take in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribed low K⁺ diets, which provide 2000 mg per day—exactly what consumers take in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribed low K⁺ diets, which provide 2000 mg per day—exactly what consumers take in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribed low K⁺ diets, which provide 2000 mg per day—exactly what consumers take in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribed low K⁺ diets, which provide 2000 mg per day—exactly what consumers take in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribed low K⁺ diets, which provide 2000 mg per day—exactly what consumers take in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribed low K⁺ diets, which provide 2000 mg per day—exactly what consumers take in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribed low K⁺ diets, which provide 2000 mg per day—exactly what consumers take in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribed low K⁺ diets, which provide 2000 mg per day—exactly what consumers take in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribed low K⁺ diets, which provide 2000 mg per day—exactly what consumers take in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribed low K⁺ diets, which provide 2000 mg per day—exactly what consumers take in approximately 2000 mg of K⁺ per day, and therefore, K⁺ has been listed as a nutrient of concern because of inadequate intake (6). This is important because patients with advanced CKD and undergoing dialysis are prescribe

A Potential Paradigm Shift: Potassium Binders in K⁺-Restricted Diets in Patients With CKD

By Deborah J. Clegg and Biff F. Palmer

Table. Characteristics of a diet enriched in fruits and vegetables that minimize hyperkalemia

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<thead>
<tr>
<th>Carbohydrate load causing stimulation of insulin release and shift of K⁺ into cells</th>
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<tr>
<td><strong>Increased alkali content</strong></td>
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<tr>
<td><strong>Shift of K⁺ into cells</strong></td>
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<td><strong>Increased K⁺ secretion brought about by the pH effect on the renal outer medullary channel in the collecting duct</strong></td>
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<th>High fiber content</th>
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<tr>
<td><strong>Increased stool bulk and less K⁺ absorption</strong></td>
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<td><strong>Decreased constipation</strong></td>
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<td><strong>Increased kidney K⁺ secretion via gastric-kidney crosstalk</strong></td>
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Lack of exogenous administration of K⁺ for flavoring as commonly present in processed foods


References