Nutritional Assessment in Chronic Kidney Disease

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LEARNING OBJECTIVES

1. Discuss the role of biochemical parameters as a component of a comprehensive nutritional assessment.
2. Identify the biochemical parameters and the recommended frequency of measurement suggested in the Kidney Disease Outcome Quality Initiative nutrition guidelines for routine, confirmatory, and screening testing.
3. List the strengths and weaknesses of various biochemical tests in the chronic kidney disease population.
4. Discuss the major dietary and nutrient challenges that patients face at each of the five stages of chronic kidney disease that will guide the choice of dietary assessment method.
5. Use dietary intake data to counsel chronic kidney disease patients according to the Kidney Disease Outcome Quality Initiative guidelines.
6. Describe the different methods of body composition assessment that are applicable to adults with chronic kidney disease such as dual energy X-ray absorptiometry, bioelectrical impedance, and total body water.

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7. State the anthropometric measurements used in assessing nutrition status in the chronic kidney disease population.
8. Understand the limitations and sources of error in evaluating and using body composition in the chronic kidney disease population.
9. Explore physiological mechanisms responsible for lesion and functional deficits.
10. Encourage a deeper nutritional thought process that considers the role of nutrient intake/disposition, drug/nutrient interaction, medical comorbidity, and nutritional cost of therapeutic interventions in the evolution of patient-specific nutrient intake plans.

Summary

Comprehensive nutrition assessments are comprised of an evaluation of the individual’s body composition, biochemical tests, dietary intake and habits, and clinical profile. Integration of these methodologies is used to guide appropriate medical nutrition therapy and to monitor responses to therapeutic nutrition interventions. This chapter reviews (i) common biochemical tests used for assessment of nutritional and inflammatory status; (ii) dietary intake methodologies that provide the data needed to improve nutritional status and quality of life among patients with chronic kidney disease (CKD); (iii) body composition assessment methods useful in the CKD population which can facilitate the prescription and monitoring of appropriate clinical and nutritional therapies; and (iv) nutrition physical assessment techniques with illustrations of physical manifestations of nutrient deficiencies and excesses with a specific focus on patients with CKD.

Key Words: Nutrition assessment; biochemical tests; dietary assessment; body composition; anthropometry; nutrient-based lesions; nutrition physical examination; physical findings.

1. INTRODUCTION

Suboptimal nutritional status is common in people in the latter stages of chronic kidney disease (CKD) and is associated with increased morbidity and mortality and higher health care costs. Data from the Modification of Diet in Renal Disease (MDRD) study demonstrated that protein-energy nutritional status deteriorates as glomerular filtration rate declines. Frank protein-energy malnutrition (PEM) prior to initiation of dialysis was fairly rare, but evidence of deteriorating nutritional intake was common as kidney function declined. Among people receiving dialysis, depending on the nutritional parameters chosen and thresholds used for identifying deficits, the literature reports 18–75% of people receiving maintenance dialysis have evidence of protein deficits (I). Measures of nutritional status deteriorate with time,