

CHRONIC KIDNEY DISEASE PREDICTORS IN ADOLESCENTS

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Recent decades have revealed a significant change in the eating behavior and lifestyle of adolescents. These changes are mainly observed in the increasing consumption of high-calorie foods and sweet drinks, as well as in a more sedentary lifestyle and a significant lack of exercise approximately 2 years—during the COVID-19 pandemic— have only intensified this unfavorable behavior [2]. The National Kidney Foundation published the Kidney Disease Outcomes Quality Initiative (K/DOQI) clinical practice guidelines for CKD in 2001. Although the preponderance of information in this document pertains to adult disease, the definition and staging of CKD are applicable to pediatric patients. CKD is defined as either kidney damage or a glomerular filtration rate (GFR) of less than 60 mL/min/1.73 m² for more than 3 months. Abnormalities on pathology, urine, or blood tests or imaging studies are considered evidence of kidney damage, with or without decreased GFR. Staging depends on the level of kidney function based on measured GFR. It ranges from Stage 1, reflecting normal or increased GFR with evidence of kidney damage, to Stage 5, reflecting severe loss of function (GFR \leq 15 mL/min/ 1.73 m²) or dialysis. Although stage classifications are somewhat arbitrary, they may help clinicians anticipate the necessary medical interventions and monitoring as a patient progresses through each stage. When functioning nephron mass is reduced by 50% (GFR 80%–100% of normal), as seen in single kidneys, the disease generally has no clinical manifestations. When 25% of nephrons remain, GFR is reduced to 50%, with mild renal insufficiency evident by biochemical abnormalities. Although there are generally few clinical symptoms, an increased incidence of short stature has been reported [3]. Blood and urine chemistry abnormalities become more evident when patients have a GFR between 25% and 50%, and progressive deterioration is likely. Chronic renal insufficiency (CRI) is defined by these authors as a GFR less than 25% of normal, which may be complicated by acidosis, anemia, growth failure, and uremia. Dialysis and meticulous medical management are required to sustain life when GFR is less than 5% of normal for age[4].

Primary care of adolescent patients with CKD requires an understanding of anticipatory management of the multisystem consequences of inadequate renal function. The goals of therapy are anticipation and replacement of lost physiologic functions so that the patient can grow and develop normally, remain engaged in age-

appropriate activities, and avoid complications of CKD [5]. The team approach to care is essential to providing ongoing and escalating care for these adolescents and in helping their families to meet the medical and psychosocial challenges of chronic illness. In addition to the primary care physician and pediatric nephrologist, the care team may include nutritionists, social workers, nurses, and school personnel, such as teachers and guidance counselors. Anticipated physiologic consequences of CKD include issues of fluid, electrolyte, and acid-base balance, as well as the development of anemia, cardiovascular disease, metabolic bone disease, and growth failure[6].

Every organ system may be affected by the decreased capability of the kidneys to remove metabolic waste products, maintain fluid, electrolyte, and acid-base balance, or perform essential endocrine functions. Resulting derangements may produce no clinically apparent abnormalities; patients may also have subtle symptoms such as poor school performance or fatigue or may present with overt hypertension, edema, and signs of renal failure. Because of the wide spectrum of disease, the physician providing primary care to the adolescent must be knowledgeable about the clinical and laboratory findings leading to the diagnosis of CKD and must understand the physiologic basis for therapeutic management.