

Dehydration and Electrolyte Imbalance in Ketogenic Therapies: Clinical Risks and Targeted Nutritional Management

Sybille KetoM, Sybille Kraft Bellamy

President, Clinical Nutrition & Metabolic Strategies, KetoM+, Le Mans, France

Abstract:

Background: Ketogenic therapies are increasingly applied in neurological, metabolic, and preventive health contexts. While effective, the metabolic shift induced by carbohydrate restriction results in predictable alterations in fluid and electrolyte balance, increasing the risk of dehydration—particularly during dietary initiation and in medically vulnerable populations.

Methods: This work synthesizes current clinical evidence on the physiological mechanisms of dehydration in ketogenic therapies, including insulin-mediated renal natriuresis, osmotic diuresis, glycogen depletion, and ketone-associated respiratory water loss. Particular attention is given to populations at increased risk, including pediatric patients, elderly individuals, and patients with neurological or genetic disorders.

Results: Clinical data indicate that inadequate hydration and electrolyte replacement during ketogenic therapy may lead to hypovolemia, electrolyte deficiencies (notably sodium, potassium, and magnesium), neuromuscular symptoms, cognitive impairment, reduced dietary adherence, and increased seizure susceptibility in neurological populations. Water-only hydration strategies are insufficient and may exacerbate electrolyte dilution. Evidence supports targeted electrolyte management as an essential component of safe ketogenic therapy, particularly in patients unable to self-regulate intake or communicate early symptoms.

Discussion: Medically fragile populations present heterogeneous tolerance profiles, requiring individualized hydration strategies. Gastrointestinal sensitivity, feeding limitations, age-related physiology, comorbidities, and caregiver-dependent protocols necessitate tailored formulations rather than uniform supplementation.

Conclusion: Dehydration in ketogenic therapies is predictable, clinically significant, and preventable through structured hydration and electrolyte management. Dedicated ketogenic hydration solutions, designed without carbohydrates and adapted to varying physiological needs, should be considered integral to ketogenic care.

In this context, KetoM+ has developed CetoHydro, a range of ketogenic-compatible hydration formulations adapted for children, adults, and medically fragile individuals, supporting safe hydration and electrolyte balance while preserving ketosis in therapeutic and long-term ketogenic protocols.