



The Role of Intradialytic Parenteral Nutrition (IDPN) in Stabilizing Nutrition and Supporting Growth in Children with ESRD

D. Leatherman, T. DeVane, K. Howard

Pentec Health, Inc., Boothwyn, PA, USA

INTRODUCTION:

Pediatric End Stage Renal Disease (ESRD) patients face unique nutritional challenges compared to the adult population. Increased metabolic requirements to support growth, combined with the kidney's reduced capacity to manage metabolic load, contribute to abnormal growth as well as developmental, neurocognitive, and psychosocial delays.^{1,2} The KDOQI Pediatric Practice Guidelines for Nutrition recommend a progressive approach to nutritional interventions, including counseling, oral or enteral supplements, and IDPN.³ This case reviews the provision of IDPN for a seven-year-old ESRD pediatric patient.

METHODS:

Patients must meet the National Kidney Foundation (NKF) energy and/or protein malnutrition criteria to qualify for IDPN therapy. To meet protein malnutrition criteria, patients must have a three-month average albumin level of <3.5 g/dL or an nPCR/nPNA of <1.0 g/kg/day. To meet energy malnutrition, patients must have $>5\%$ weight loss over three months, $>10\%$ weight loss over six months, an estimated target weight $<90^{\text{th}}$ percentile of ideal body weight, or a BMI-for-height $<5^{\text{th}}$ percentile. IDPN formulations include amino acids, dextrose and optional lipid emulsion. Therapy is initiated by titrating the amino acid and dextrose solution to the target dose over four weeks, with lipid emulsion added at week five if prescribed. Patients are monitored monthly and the formula is adjusted based on response.

RESULTS:

A seven-year-old male with energy malnutrition related to ESRD dialysis treatment was initiated on IDPN based on a BMI of 14.7 kg/m² (35^{th} percentile for age). The patient received IDPN (31 g of amino acids and 21 g of dextrose in 200 mL) three times per week for 20 months. During this period, his weight increased from 22 kg to 28.8 kg (50^{th} percentile for age), meeting therapeutic goals. IDPN was restarted after one year due to weight loss. Upon reinitiation (45 g of amino acids and 22 g of dextrose in 256 mL), the patient gained 1.5 kg over four months before discontinuing therapy due to insurance coverage.

CONCLUSIONS:

This case demonstrates the ability of IDPN in improving nutritional status in pediatric ESRD patients. Further studies are needed to assess the long-term impact of IDPN on clinical outcomes in this population.

REFERENCES:

1. Nelms, Christina L. et al. Advances in Chronic Kidney Disease, Volume 29, Issue 3, 283 - 29.
2. Cirillo et al Clin Kidney J. 2023 Apr 24;16(10):1600-1611.
3. KDOQI Clinical Practice Guideline for Nutrition in Children with CKD: 2008 Update. Am J Kidney Dis 53: S1-S124, 2009 (suppl 2).