

Effect of Intra-Dialytic Parenteral Nutrition (IDPN) on malnourished maintenance haemodialysis patients – Case series

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Introduction

Intra-Dialytic Parenteral Nutrition (IDPN) is a method of giving additional energy and nutrients during dialysis via an infusion pump from the venous end of the dialysis system. The primary goal of the therapy is to cover the estimated nutritional requirements of the patient [1]. When a haemodialysis patient is having gastrointestinal symptoms like loss of appetite, nausea, vomiting and gastroparesis but the oral intake is more than 50% of the requirement, IDPN can be used to deliver the remaining amount. But it is almost never used in the Sri Lankan setup.

Case series

We have screened 154 haemodialysis patients in the Hanthana Haemodialysis Centre at the National Hospital Kandy. Only four patients met the criteria to start IDPN; those are serum albumin level less than 3.5 g/dl, body mass index less than 20 kg/m² and weight loss of more than 10% over six months [2]. All four patients were females and had an age range from 28 to 42 years and they were in maintenance haemodialysis for more than two years.

IDPN was started on those four patients at 8 ml/kg with 50% dextrose, 10% amino acid and 20% MCT/LCT (medium and long-chain triglycerides) based lipid solution. Fifty percent of the energy was given by dextrose, 20% from amino acid and the remaining 30% from lipid solution. They were delivered in three separate infusion pumps and connected to the venous end of the dialysis system. It was infused throughout the haemodialysis duration of around 3½ hours per session and given two times a week. Infusion volume gradually increased up to 16 ml/kg in eight weeks and continued that volume for a further eight weeks to cover 16 weeks. Vitamins and minerals did not add to the parenteral nutrition solution.

Monitoring was continued throughout the process, initially more frequently and gradually widening the gap between monitoring. A clinical assessment was done to identify any side effects. Anthropometric parameters, bioelectrical impedance analysis, handgrip dynamometry, finger-prick blood sugar levels, and blood investigations like full blood count and serum protein were done at the end of the 2nd, 4th, 10th and 16th weeks.

Out of the four patients, one patient developed headache, nausea and vomiting during dialysis and her IDPN was stopped at the end of the second week. After 16 weeks of IDPN in the other three patients, the mean weight gain was 1.72 kg and body mass index increased by 0.77 kg/m². The mean muscle mass was reduced by 1.9% and the mean total body fat mass increased by 1.8%. The handgrip strength was increased by 2.7 kg. There was a 0.1 g/dl increase in mean haemoglobin level and a 0.2 g/dl increase in both total serum protein and serum albumin level. Patients were quite happy to receive IDPN; even the patient who we were stopped IDPN in the second week wanted to continue with the side effects because they felt more energetic and healthy.

Discussion

IDPN has a positive impact on maintenance haemodialysis patients. Identifying the correct patients who benefit from IDPN is important. The correct composition of the IDPN solution and the gradual progression of the volume is vital to reducing the risk of getting complications. The infusion rate is better kept below 125 ml/hr in the initial phase and can go up to 250 ml/hr in the latter stages [3]. Even keeping the rate around 100 ml/hr at the initial phase, one patient developed symptoms that may be due to hyperosmolality. There was

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a mean of 4% weight gain and 19% increase in handgrip power; the increase in fat percentage may be due to not combining physical activity with enhanced energy supply. The drawback of this method is the cost of parenteral nutrition products. Ideally, the setup should develop to prepare parenteral nutrition solutions to individual needs, then the wastage of products goes down. The remaining parenteral nutrition product in the bottle after delivering the nutrition needs has to be discarded as there are no methods to prepare individual requirements. IDPN is a good option to supply adequate nutrition when other methods cannot cover the nutrition needs.

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