Effect of Intra-dialysis Nutrients Admixture vs Conventional Intra-dialysis Parenteral Nutrition on Nutrition Status and Inflammation in Malnourished Hemodialysis Patients: A Randomized, Controlled Trial

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Background: Protein/caloric malnutrition and inflammation is a major problem in long-term hemodialysis patients. Total nutrients admixture containing 80% olive oil-based intravenous lipid emulsions and low proportion of polyunsaturated fatty acids may offer several advantages such as a reduction of oxidative and inflammatory effects in the end stage renal disease (ESRD).

Objective: To assess the efficacy and tolerance of intra-dialysis nutrients admixture (admixture-IDPN) and conventional intra-dialysis parenteral nutrition (conventional-IDPN) on nutritional status, inflammatory markers, and safety in malnourished ESRD on hemodialysis.

Methods: The study was a randomized controlled trial. Patients with malnourished ESRD on hemodialysis were randomly assigned into an admixture-IDPN group (n=13) and a conventional-IDPN group (n=13). Nutritional assessment and inflammatory markers including high sensitivity C-reactive protein (hs-CRP) and interleukin-6 (IL-6) were measured at baseline and 4 weeks following the intervention.

Results: At the end of 4 weeks, nutritional parameters including serum albumin (0.41±0.18 vs 0.16±0.22, P=0.004), pre-albumin (7.88±4.6 vs 2.01±2.63, P=0.001), and urea reduction ratio (2.92±0.76 vs 0.92±2.78, P=0.026) in the admixture-IDPN group had a significantly greater improvement than the conventional-IDPN group. The decline in serum IL-6 level was -13.9 pg/mL larger among the admixture-IDPN vs the conventional-IDPN groups (95% CI -20.41 to -7.4 pg/mL). The admixture-IDPN group had also higher absolute lymphocyte counts and lower hs-CRP level after treatment, but there were no significant changes in the conventional-IDPN group. There were no statistically significant differences between the two groups in the risk of electrolytes abnormalities and adverse events.

Conclusion: Malnourished ESRD patients on dialysis receiving olive oil-based lipid emulsions and low polyunsaturated fatty acids IDPN show modest improvements in nutritional status and inflammatory cytokines.

Keywords: Intradialytic parenteral nutrition, Malnutrition, End stage renal disease, Hemodialysis, Olive oil-based lipid emulsion