Effects of arginine-containing total parenteral nutrition on N balance and phagocytic activity in rats undergoing a partial gastrectomy

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Abstract

The present study investigated the effect of arginine (Arg)-containing parenteral nutrition on phagocytic activity to elucidate the possible roles of Arg in the secretion of anabolic hormones and N balance in rats undergoing gastrectomy. Rats were divided into two experimental groups and received total parenteral nutrition (TPN). The TPN solutions were isonitrogenous and identical in nutrient compositions except for differences in amino acid content. One group received conventional TPN, the other group replaced 2 % of the total energy as Arg. After receiving TPN for 3 d, one-third of the rats in each experimental group were killed as the baseline group. The remaining rats underwent a partial gastrectomy and were killed 1 or 3 d after surgery. The results showed that there were no differences in N balance, plasma growth hormone and insulin-like growth factor-1 levels between the two groups before or after surgery. The phagocytic activity of peritoneal macrophages was higher in the Arg group than in the control group 1 d after surgery. There were no differences in the phagocytic activities of blood polymorphonuclear neutrophils between the two groups at various time points. TNF-a levels in peritoneal lavage fluid were lower in the Arg group than in the control group on post-operative day 3. These results suggest that parenterally infused Arg enhances phagocytic activity and reduces the production of inflammatory mediators at the site of injury. However, Arg supplementation did not influence the secretion of anabolic hormones nor N balance in rats with a partial gastrectomy.