
Abstract

BACKGROUND:
The objective of the present study was to ascertain whether simultaneous administration of glutamic acid (Glu) and taurine (Tau) to patients on total parenteral nutrition (TPN) could improve intestinal mucosal atrophy and suppress bacterial translocation.

METHODS:
A 5-day TPN study was conducted in 5-week-old Sprague-Dawley rats. Commercially available Glu was used for TPN in group G and was enhanced with Tau (500 mg kg(-1) day(-1)) in group GT. Oral nutrition was provided in group C controls. At 5 days, amino acid and cytokine levels in plasma and endotoxin levels in portal blood were measured. The histology of the small intestine, liver, and lung were analyzed.

RESULTS:
Mucosal thickness and villus height in the small intestine were lower for group G than for groups C and GT. Taurine level in group GT was higher than in group G. Arginine and citrulline levels in groups G and GT were lower than in group C. Taurine level in the small intestine was greater in group GT than in group G. Citrulline concentration was lower in group G than in groups GT and C. Endotoxin level in portal blood and cytokine (tumor necrosis factor alpha, interleukin-1beta, and interleukin-6) levels in blood tended to be lower for group GT than for group G, but no significant differences were noted. Immunostaining showed strong positive reactions to vascular cell adhesion molecule-1 in the liver and lung for group G, and milder reactions for group GT.

CONCLUSIONS:
Simultaneous administration of Glu and Tau improved small intestinal mucosal thickness and villus height during TPN. Levels of Tau in the small intestine and plasma increased, and the level of citrulline in the small intestine improved. Decreased expression of adhesion molecules in the liver and lung and improved microcirculation in the liver were also confirmed.