Abstract

Background: Glutamine and proline are metabolized in the liver and may collaborate on its regeneration. Parenteral nutrition (PN) containing either glutamine or proline was given to partially hepatectomized rats. The total RNA content and growth factor gene expression in hepatic remnants was measured, to determine the effects of these amino acid supplementation on the expression of growth factors during liver regeneration. Methods: Wistar rats nourished (HN) and malnourished (HM) were hepatectomized and divided in two groups: 20 receiving PN enriched with Alanyl-Glutamine (HN-Gln and HM-Gln) and 20 PN enriched with proline+alanine (HN-Pro and HM-Pro). The control groups comprised 7 nourished (CN) and 7 malnourished (CM) rats that didn’t undergo surgery. Growth factor and thymidine kinase mRNA levels were measured by RT-PCR. Results: In nourished rats, total hepatic RNA levels were lower in the HN-Gln and HN-Pro groups (0.75 and 0.63 g/mg tissue, respectively) than in control group (1.67 g/mg tissue) (P < 0.05). In malnourished rats, total hepatic RNA content was higher in the HM-Pro group than HN-Pro, HM-Gln, and CM (3.18 vs. 0.63, 0.93 and 1.10 g/mg, respectively; P < 0.05). Hepatocyte growth factor mRNA was more abundant in the HM-Gln group when compared to CM (0.31 vs. 0.23 arbitrary units) and also in HM-Pro in relation to HM-Gln, HN-Pro, and CM (0.46 vs. 0.33 and 0.23, respectively, P < 0.05). Conclusions: Proline or glutamine supplementation in malnourished rats improves total RNA content in the remnant hepatic tissue. Amino acids administration increased HGF gene expression after partial hepatectomy in malnourished rats, with a greater effect of proline than glutamine.

Keywords
Amino acids, Parenteral nutrition, Liver regeneration, Proline. Glutamine.