Effects of glutamine supplementation on splenocyte cytokine mRNA expression in rats with septic peritonitis

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摘要

Abstract

AIM: To investigate the effects of glutamine (GLN)-enriched diets before and GLN-containing total parenteral nutrition (TPN) after sepsis or both on the secretion of cytokines and their mRNA expression levels in splenocytes of rats with septic peritonitis.METHODS: Rats were assigned to a control group and 4experimental groups. The control group and experimental groups 1 and 2 were fed a semipurified diet, while experimental groups 3 and 4 had part of the casein replaced by GLN which provided 25% of the total nitrogen.After rats were fed with these diets for 10 d, sepsis was induced by cecal ligation and puncture (CLP), whereas the control group underwent a sham operation, at the same time, an internal jugular vein was cannulated. All rats were maintained on TPN for 3 d. The control group and experimental groups 1 and 3 were infused with conventional TPN, while the TPN in experimental groups 2 and 4 was supplemented with GLN, providing 25% of the total nitrogen in the TPN solution. All rats were kiued 3 d after sham operation or CLP to examine their splenocyte subpopulation distribution and cytokine expression levels.RESULTS: Most cytokines could not be detected in plasma except for IL-10. No difference in plasma IL-10 was observed among the 5 groups. The IL-2, IL-4, IL-10, and TNF-α mRNA expression levels in splenocytes were significantly higher in experimental groups 2 and 4 than in the control group and group 1. The mRNA expression of IFN-γ was significantly higher in the GLN-supplemented groups than in the control group and experimental group 1. The proportion of CD45Ra+ was increased, while those of CD3+ and CD4+ were decreased in experimental group 1 after CLP was performed. There were no differences in spleen CD3+ lymphocyte distributions between the control and GLN-supplemented groups.CONCLUSION:GLN supplementation can maintain Tlymphocyte populations in the spleen and significantly enhance the mRNA expression levels of Th1 and Th2cytokines and TNF-α in the spleen of rats with septic peritonitis.