# Effects of arginine supplementation on splenocyte cytokine mRNA expression in rats with gut-derived sepsis

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## Abstract

AIM: To investigate the effects of arginine (Arg)-enriched diets before sepsis and/or Arg-containing total parenteral nutrition (TPN) after sepsis or both on cytokine mRNA expression levels in splenocytes of rats with gut-derived sepsis. METHODS: Rats were assigned to four experimental groups. Groups 1 and 2 were fed with a semipurified diet, while groups 3 and 4 had part of the casein replaced by Arg which provided 2% of the total calories. After the rats were fed with these diets for 10 d, sepsis was induced by cecal ligation and puncture (CLP), at the same time an internal jugular vein was cannulated. All rats were maintained on TPN for 3 d. Groups 1 and 3 were infused with conventional TPN, while groups 2 and 4 were supplemented with Arg which provided 2% of the total calories in the TPN solution. All rats were killed 3 d after CLP to examine their splenocyte subpopulation distribution and cytokine expression levels. RESULTS: Plasma interleukin (IL)-2, IL-4, tumor necrosis factor-alpha (TNF-alpha) and interferon (IFN-gamma) were not detectable 3 d after CLP. There were no differences in the distributions of CD45Ra(+), CD3(+), CD4(+), and CD8(+) cells in whole blood and splenocytes among the four groups. The splenocyte IL-2 mRNA expression in the Arg-supplemented groups was significantly higher than that in group 1. IL-4 mRNA expression in groups 3 and 4 was significantly higher than that in groups 1 and 2. The mRNA expression of IL-10 and IFN-gamma was significantly higher in group 4 than in the other three groups. There was no difference in TNF-alpha mRNA expression among the four groups. CONCLUSION: The influence of Arg on the whole blood and splenic lymphocyte subpopulation distribution is not obvious. However, Arg administration, especially before and after CLP, significantly enhances the mRNA expression levels of Th1 and Th2 cytokines in the spleen of rats with gut-derived sepsis.