

Effects of ω -3 fatty acids on leukocyte Th1/Th2 cytokine and integrin expression in rats with gut-derived sepsis

LIN Ming-Tsan; HSU Chun-Sen; YEH Sung-Ling; YEH Chiu-Li; CHANG King-Jen; LEE
Po-Huang; CHEN Wei-Jao

Lin MT;Hsu CS;Yeh SL;Yeh CL;Chang KJ;Lee PH;Chen WJ

Abstract

Objectives: This study examined the effect of fish oil (FO)-enriched diets before and/or ω -3 fatty acid-containing total parenteral nutrition (TPN) after sepsis on the distribution of the T-lymphocyte subpopulation, intracellular cytokine, and intestinal immunity in rats with gut-derived sepsis. **Methods:** Rats were assigned to a control or one of four experimental groups. The control group and groups 1 and 2 were fed a semipurified diet, and groups 3 and 4 received FO instead of 20% soybean oil. After feeding the diets for 10 d, sepsis was induced by cecal ligation and puncture (CLP) in the experimental groups, whereas a sham operation was performed in the control group. TPN was maintained for 3 d after the CLP or sham operation. The control group and groups 1 and 3 were infused with conventional TPN, whereas the TPN solution used for groups 2 and 4 were supplemented with FO. All rats were sacrificed 3 d after the operation to examine their immune responses. **Results:** Plasma and intestinal immunoglobulin A levels were higher in the FO-supplemented groups than in the control group and group 1. Lymphocyte interferon- γ expression in groups 3 and 4 was significantly lower, whereas interleukin-4 expression was higher than those of the control group and groups 1 and 2. The splenocyte CD4 percentage in groups 3 and 4 and the CD4/CD8 ratio in group 4 were significantly higher than those in group 1. **Conclusion:** These findings suggest that FO administration before and/or after CLP are not immunosuppressive. FO-enriched diets before or before and after CLP resulted in a T-helper type 2 response and enhanced immunoglobulin A secretion. In addition, the splenocyte CD4 levels and CD4/CD8 ratio were maintained in rats with gut-derived sepsis.