

Dietary glutamine supplementation reduces cellular adhesion molecule expression and tissue myeloperoxidase activity in mice with gut-derived sepsis

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摘要

Abstract

Objectives: This study investigated the effects of glutamine (Gln) on plasma intracellular adhesion molecule-1 levels and leukocyte integrin (CD 11a/CD18 and CD11b/CD18) expressions in gut-derived sepsis. Myeloperoxidase (MPO) activities in organs were also analyzed to identify the extent of tissue injury resulting from neutrophil infiltration. **Methods:** Mice were randomly assigned to a normal group (NC), a control group, or a Gln group. The NC group was fed standard chow diet; the control group was fed a common semipurified diet; and the Gln group received a diet in which part of the casein was replaced by Gln, which provided 25% of total amino acid nitrogen. After 3 wk, sepsis was induced by cecal ligation and puncture (CLP) in the control and Gln groups. Mice in the experimental groups were killed at 0, 6, 12, and 24 h after CLP. Mice in the NC group were killed when CLP was performed. Blood and organ samples were collected for further analysis. **Results:** Plasma intracellular adhesion molecule-1 levels were significantly lower in the Gln group than in the control group at 6, 12, and 24 h after CLP. Expressions of lymphocyte CD11a/CD18 were significantly higher, whereas polymorphonuclear lymphocyte expressions of CD11b/CD18 were lower in the Gln group than in the corresponding control group at 6 and 12 h after CLP. In comparisons of MPO activities in various organs, the Gln group had lower MPO activities at 6 and 12 h in the lung, at 6, 12, and 24 h in the liver, at 12 and 24 h in the kidneys, and at 12 h in the intestine than those in the control group. **Conclusions:** Results of this study demonstrate that a Gln-supplemented enteral diet increased lymphocyte CD11a/CD 18 expressions, whereas neutrophil CD11b/ CD18 expressions, circulating intracellular adhesion

molecule-1 levels, and MPO activities in various organs decreased with gut-derived sepsis. These findings suggest that, under septic conditions, Gin administration may enhance lymphocyte function, attenuate interactions between polymorphonuclear lymphocytes and endothelium, and thus may decrease neutrophil infiltration into tissues. (c) 2006 Elsevier Inc. All rights reserved.