Effects of arginine supplementation on antioxidant enzyme activity and macrophage response in burned mice

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Abstract

This study investigated the effect of arginine (Arg) supplementation on antioxidant enzyme activities and macrophage response in burned mice. Experiment 1: 60 male BALB/c mice were assigned to two groups. One group was fed a control diet with casein as the protein source, the other group was supplemented with 2% Arg in addition to casein. The two groups were isonitrogenous. After 4 weeks, all mice received a 30% body surface area burn injury. The antioxidant enzyme activities and lipid peroxides in the tissues were analyzed. Experiment 2: 20 mice were divided into two groups and burn injury was induced after feeding for 4 weeks as described in experiment 1. Twenty-four hours after the burn, tumor necrosis factor-alpha (TNF-alpha) secreted by cultured peritoneal macrophages was measured. The results show that antioxidant enzyme activities and lipid peroxides in tissues tended to be lower in the Arg group than in the control group after the burn. Production of TNF-alpha by peritoneal macrophages after stimulation with lipopolysacchride (LPS) was significantly elevated in the Arg group, whereas no response was observed in the control group. These results suggest that dietary Arg supplementation attenuates the oxidative stress induced by burn injury, and a better macrophage response was observed when Arg was administered.