

Effects of dietary arginine supplementation on nutrient

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Abstract

This study investigated the effect of arginine (Arg) supplementation on nutrient metabolism and splenocyte response in burned mice. Also, the survival of burned mice complicated with *Pseudomonas aeruginosa* was evaluated. Experiment 1: Sixty male BALB/c mice were assigned to 2 groups. One group was fed with casein as the protein source, the other group was supplemented with 2.4% (w/w) Arg in addition to casein. After 4 weeks, all mice received a 30% body surface area burn injury. Mice in each group were sacrificed for 3 consecutive days after the burn with 10 mice on each respective day. Plasma blood chemistry and amino acid profiles were analyzed. Spleens were removed aseptically from mice 1 day after the burn, interferon (IFN)- γ and interleukin (IL)-4 concentrations secreted by cultured splenocytes were measured. Experiment 2: Thirty mice were divided into 2 groups as described in experiment 1. After 4 weeks, burn injury was induced, and mice were challenged with *P. aeruginosa*. Survival of the burned mice was observed for 7 days. In experiment 1, no differences in plasma glucose, non-esterified fatty acids, and lactic acid concentrations were observed between the 2 groups on each respective day. Arg group had higher levels of alanine and branched-chain amino acids on day 2, also, plasma Arg and glutamine levels were higher in the Arg group on days 2 and 3 after the burn than in the control group. IFN- γ concentrations in mitogen stimulated splenocyte cultures were higher in the Arg group than the control group. No difference in IL-4 concentrations was observed. In experiment 2, the survival did not differ between the 2 groups. These results suggest that Arg supplementation had no beneficial effect on glucose and lipid metabolism, nor had any effect on survival when burned mice were complicated with *P. aeruginosa* infection. However, Arg supplementation reduced the depletion of plasma Arg and glutamine levels at the hypercatabolic stage after the burn, and may have potential benefit on enhancing cellular immune response.