

[Metabolism](#). 1991 Feb;40(2):155-64.

Glutamine metabolism in skeletal muscle of septic rats.

[Ardawi MS](#), [Majzoub MF](#).

Department of Clinical Biochemistry, King Fahd Medical Research Centre, College of Medicine and Allied Sciences, King Abdulaziz University, Jeddah, Saudi Arabia.

Abstract

The metabolism of skeletal muscle glutamine was studied in rats made septic by cecal ligation and puncture technique. Blood glucose was not significantly different in septic rats, but lactate, pyruvate, glutamine, and alanine were markedly increased. Conversely, blood ketone body concentrations were markedly decreased in septic rats. Both plasma insulin and glucagon were markedly elevated in septic rats. Sepsis increased the rates of glutamine production in muscle, but without marked effects on skin and adipose tissue preparations, with muscle production accounting for over 87% of total glutamine produced by the hindlimb. Sepsis produced decreases in the concentrations of skeletal muscle glutamine, glutamate, 2-oxoglutarate, and adenosine monophosphate (AMP). The concentrations of ammonia, pyruvate, and inosine monophosphate (IMP) were increased. Hindlimb blood flow showed no marked change in response to sepsis, but was accompanied by an enhanced net release of glutamine and alanine. The maximal activity of glutamine synthetase was increased only in quadriceps muscles of septic rats, whereas that of glutaminase was decreased in all muscles studied. Tyrosine release from incubated muscle preparation was markedly increased in septic rats; however, its rate of incorporation was markedly decreased. It is concluded that there is an enhanced rate of production of glutamine from skeletal muscle of septic rats. This may be due to changes in efflux and/or increased intracellular formation of glutamine; these suggestions are discussed