

[Clin Sci \(Lond\)](#). 1988 Feb;74(2):165-72.

Skeletal muscle glutamine production in thermally injured rats.

[Ardawi MS](#).

Department of Clinical Biochemistry, Faculty of Medicine and Allied Sciences, King Abdulaziz University, Jeddah, Saudi Arabia.

Abstract

1. The effect of thermal injury (33-35% of body surface area) on the regulation of glutamine metabolism was studied in skeletal muscles of rats 7 days after injury. 2. Injury increased the rates of glutamine production in muscle, skin and adipose tissue preparations, with muscle production accounting for over 90% of total glutamine produced by the hindlimb. 3. Injury produced decreases in the concentrations of skeletal muscle glutamine (36%, P less than 0.001), glutamate (39%, P less than 0.001), alanine (24%, P less than 0.001), pyruvate (35%, P less than 0.001), 2-oxoglutarate (51%, P less than 0.001) and adenosine 5'-triphosphate (38%, P less than 0.001). The concentrations of ammonia (42%, P less than 0.001) and inosine 5'-phosphate (430%, P less than 0.001) were increased. 4. The maximal activity of glutamine synthetase was increased (22-40%, P less than 0.001) in muscles of injured rats, whereas that of glutaminase was unchanged. 5. Hindlimb blood flow decreased by approximately 15% in injured rats, which was accompanied by an enhanced net release of glutamine (80%, P less than 0.001) and alanine (44%, P less than 0.001). 6. It is concluded that there is an enhanced rate of release of both glutamine and alanine from skeletal muscle of thermally injured rats. This may be due to changes in efflux and/or increased intracellular formation of glutamine and alanine.