Letters to the Editor

Role of Carnitine in the Oxidation of Branched-Chain Amino Acids

Dear Dr. Dinning:

In the April issue of the Journal Böhles et al. (1) reported results of a study in which the effect of L-carnitine-supplemented total parenteral nutrition on tissue amino acid concentrations in piglets was investigated. They found an increase in the concentrations of branched-chain amino acids (BCAA) in skeletal muscle of piglets given L-carnitine-supplemented solution. This nutritional regimen also raised the concentration of carnitine in the skeletal muscle. They interpreted these results to suggest that carnitine may not have a role in the oxidation of BCAA. They state that our previous demonstration of increased oxidation of leucine by carnitine in rat skeletal muscle was at an unphysiological concentration of carnitine (2). This is not true. Böhles et al. (1) have made an error when they converted the in vitro concentration of carnitine used by us (2) into the amount of carnitine/gram tissue. According to their calculation, 0.50 mM carnitine corresponds to about 750 µmol/g wet weight (1). This is incorrect. A carnitine concentration of 0.50 mM corresponds to 0.385 µmol/g wet muscle weight taking into account that muscle contains 77% water (3). This concentration of carnitine is well within the physiological range (2, 3). Therefore, increased oxidation of leucine by carnitine was indeed observed at concentrations within the physiological range (2). Böhles et al. (1) have not studied the oxidation of BCAA in their experiments to allow any speculation on the effect of carnitine on oxidation of these amino acids. Increased concentrations of BCAA in muscles of piglets supplemented with L-carnitine could be the result of several factors such as greater uptake, decreased release, increased production due to proteolysis or decreased utilization for protein synthesis.

Sincerely,

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LITERATURE CITED


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