

## Evaluation of ammonia metabolism in the skeletal muscles of patients with cirrhosis using N-13 ammonia PET

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**Objective:** Skeletal muscle is said to compensate for the decreased ammonia metabolism in patients with cirrhosis. Branched-chain amino acids (BCAA) are being used as a treatment for hyperammonemia, and are believed to decrease blood ammonia by consumption of BCAA in skeletal muscles. We examined ammonia metabolism of the skeletal muscles in patients with liver cirrhosis after administration of BCAA using  $^{13}\text{N}$ -ammonia positron emission tomography (PET). **Methods:** The subjects were patients with compensated or decompensated liver cirrhosis. PET studies were performed before and 2 hours after injection of BCAA. Serial dynamic PET scans (2 min  $\times$  10 frames) were started simultaneously with  $^{13}\text{N}$ -ammonia injection. The standardized uptake value (SUV) of both thighs was calculated. **Results:** In the patient with compensated liver cirrhosis, there was little difference in the rate of increase in SUV before to after administration of BCAA. However, in the patient with decompensated liver cirrhosis, the rate of increase in SUV after administration was higher than that before administration of BCAA. **Conclusion:** Ammonia metabolism in the muscle of patients with liver cirrhosis could be examined noninvasively under physiological conditions using  $^{13}\text{N}$ -ammonia PET. The muscles were found to metabolize ammonia partially, and the role of this contribution to metabolism of ammonia in patients with decompensated liver cirrhosis is particularly important.

**Key words:** liver cirrhosis, N-13 ammonia, positron emission tomography, BCAA