

Cerebral benzodiazepine receptor binding activities in patients without hepatic encephalopathy by positron emission tomography using [¹¹C]-flumazenil

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Y. Watanabe, A. Kato, M. Iwai, Y. Fujishima., K. Suzuki,
*1 T. Sasaki, *1 K. Terasaki, *1 K. Sera

First Department of Internal Medicine, Iwate Medical University
19-1 Uchimaru, Morioka 020-8505, Japan

*1 Cyclotron Research Center, Iwate Medical University
348-58 Tomegamori, Takizawa, 020-0100, Japan

Abstract

Although the benzodiazepine (BZ) like substances were recognized as the causes of hepatic encephalopathy (HE), little is known to the alterations of central gamma-aminobutyric acid (GABA)-BZ receptor in liver cirrhosis. Thus our aim is to clarify the binding activities of the GABA-BZ receptors in patients with liver cirrhosis by positron emission tomography (PET).

21 patients with liver cirrhosis without HE were undertaken PET using [¹¹C]-flumazenil. The intra-subject pixel values corrected by static scan from 20 to 40 minutes after [¹¹C]-flumazenil injection were used as semi-quantitative imaging of GABA-BZ receptor binding activities. The pixel values were divided into two groups (the high pixel value group and the low pixel value group). The patients with high pixel value group (n=11) showed the high levels of blood ammonia concentrations ($95.9 \pm 35.2 \mu\text{g/dl}$) and the patients with low pixel value group showed the low levels of blood ammonia concentrations (46.3 ± 37.9). There was a statistical differences ($p < 0.01$) between these two data. A significant positive correlation was noted between blood ammonia levels and SUV values ($p < 0.05$).

These findings suggest that the activities of GABA-BZ receptor binding activities have a relation to the blood ammonia concentrations.