

## Preserved benzodiazepine receptors in Alzheimer's disease measured with C-11 flumazenil PET and I-123 iomazenil SPECT in comparison with CBF

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This study evaluates the regional cerebral blood flow (CBF) with  $H_2^{15}O$ -PET and the distribution of central benzodiazepine receptor (BZR) with C-11 flumazenil (FMZ) by PET and I-123 iomazenil (IMZ) by SPECT in Alzheimer's disease (AD). In AD, whereas the CBF was diminished in the frontal, temporal, parietal, and occipital cortex, the distribution volume of FMZ and delayed activity of IMZ were relatively preserved in these cortices, suggesting that the BZR reduction, reflecting neuronal loss, is less prominent than the CBF suppression. The mini-mental state examination score (MMS) was weakly correlated with the CBF in the parietal cortex but not with BZR. It is speculated that the neuronal density reflected by BZR is less impaired than the neuronal function assessed with blood flow in the association cortex of AD.

High correlation was found between the uptake of FMZ and the delayed activity of IMZ. The delayed image of IMZ-SPECT is clinically useful to evaluate the preservation of neuronal density in the affected temporo-parietal association cortex in AD.

**Key words:** C-11-flumazenil, I-123-iomazenil, positron emission tomography, cerebral blood flow, Alzheimer's disease