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Decreased perfusion of the bilateral thalami in patients with chronic pain detected by Tc-99m-ECD SPECT with statistical parametric mapping

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The purpose of this study was to examine whether the Tc-99m-ECD SPECT can detect any difference between the brain perfusion in patients with chronic pain and normal controls by means of the Statistical Parametric Mapping (SPM96). The subjects were twelve patients with chronic pain (CP group) and twelve normal controls (NC group). After informed consent was obtained, 720 MBq of Tc-99m-ECD was intravenously injected as a bolus. The SPECT data were acquired once for 20 mins from 5 mins after i.v. injection of Tc-99m-ECD, with a triple-head rotating gamma camera. The SPECT data were transformed into a standard stereotactic space, and group comparisons between CP and NC groups were performed on a voxel-by-voxel basis. The subset of voxels exceeding a threshold of $p < 0.001$ in omnibus comparisons and remaining significant after correction for multiple comparison ($p < 0.05$) was displayed as a volume image rendered in three orthogonal projections. There was a significant decrease in perfusion in the bilateral thalami in the CP group, suggesting that perfusion in the thalamus generally decreases in patients with chronic pain. Tc-99m-ECD SPECT with SPM96 may be useful for studies of the mechanisms of chronic pain.

Key words: Tc-99m-ECD, chronic pain, brain perfusion, SPECT, SPM96