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Initial clinical experiences with dopamine D_2 receptor imaging by means of 2′-iodospiperone and single-photon emission computed tomography

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Dopamine D_2 receptor imaging was performed with ^{123}I labeled 2′-iodospiperone (2′-ISP) and single-photon emission computed tomography (SPECT) in 9 patients: 4 with idiopathic Parkinson's disease, 2 with parkinsonism, 1 with Wilson's disease and 2 with pituitary tumor, and the results were compared with the data for 9 normal subjects. Following an intravenous injection of ^{123}I-2′-ISP, early (within 30 min) and late (between 2 and 4 hr) SPECT images were obtained by means of a multi-detector SPECT scanner or a rotating gamma camera. In normal subjects, early SPECT images demonstrated uniform distribution of radioactivity in the cerebral gray matter and cerebellum reflecting regional cerebral blood flow, whereas late SPECT images showed high radioactivity only in the basal ganglia. All the patients with Parkinson's disease also demonstrated symmetrical basal ganglia uptake in the late SPECT images, but it was diminished in parkinsonism and Wilson's disease. One patient with a growth hormone-producing pituitary tumor had a positive uptake in the tumor. These preliminary clinical data demonstrated that 2′-ISP can be used for SPECT imaging of D_2 dopamine receptors and may be of clinical value for the diagnosis and planning of the treatment of neurological diseases.

Key words: SPECT, dopamine D_2 receptor, ^{123}I-2′-iodospiperone (2′-ISP), movement disorder, pituitary tumor