# Regional CBF changes in Parkinson's disease: a correlation with motor dysfunction

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## 摘要

## Abstract

Purpose The purpose of this study was to further localize cerebral perfusion abnormalities, and to better correlate these abnormalities with the clinical severity of Parkinson's disease (PD). Methods A single-photon emission computed tomography (SPECT) study was performed on 27 patients with PD and 24 age-matched controls. SPECT images were spatially normalized, concatenated, and then decomposed using Infomax independent component analysis (ICA). The resulting image components were separated by logistic regression into two subspaces: "disease-related" components whose subject weights differed between groups, and "disease-unrelated" components. The resultant regional cerebral blood flow (rCBF) subspace images were normalized to global CBF for each subject, and then processed using statistical parametric mapping to compare rCBF values between PD and control subjects. Results In the disease-related image subspace, patients with PD exhibited significantly higher adjusted rCBF in the putamen, globus pallidum, thalamus, brainstem, and the anterior lobe of the cerebellum, and significant hypoperfusion in the parieto-temporo-occipital cortex, the dorsolateral prefrontal cortex, the insula, and the cingulate gyrus. The motor Unified Parkinson's Disease Rating Scale scores correlated negatively with rCBF in the insula and cingulated gyrus. In the disease-unrelated image subspace, no brain voxels exhibited a significant group difference. Conclusion ICA-based separation of normalized images into disease-related and disease-unrelated subspaces revealed many disease-related group blood flow differences. The regions revealed by ICA are consistent with the current model of PD. These rCBF changes in PD have not been fully demonstrated in any single functional imaging study

previously.