

Retrospective diagnosis of Parkinsonian syndromes using whole-brain atrophy rates

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© 2017 Guevara, Bulatova. Objective: The absence of markers for ante-mortem diagnosis of idiopathic Parkinson's disease (IPD), multiple system atrophy (MSA), and progressive supranuclear palsy (PSP) results in these disorders being commonly mistaken for each other, particularly in the initial stages. We aimed to investigate annualized whole-brain atrophy rates (a-WBAR) in these disorders to aid in the diagnosis between IPD vs. PSP and MSA. Methods: Ten healthy controls, 20 IPD, 39 PSP, and 41 MSA patients were studied using Structural Imaging Evaluation with Normalization of Atrophy (SIENA). SIENA is an MRI-based algorithm that quantifies brain tissue volume and does not require radiotracers. SIENA has been shown to have a low estimation error for atrophy rate over the whole brain (0.5%). Results: In controls, the a-WBAR was $0.37\% \pm 0.28$ (CI 95% 0.17-0.57), while in IPD a-WBAR was $0.54\% \pm 0.38$ (CI 95% 0.32-0.68). The IPD patients did not differ from the controls. In PSP, the a-WBAR was