CLINICAL CORRELATES OF WHITE MATTER TRACT DEGENERATION IN PSP: A DIFFUSION TENSOR IMAGING STUDY

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Introduction: Progressive supranuclear palsy (PSP) is associated with degeneration of white matter tracts that can be detected using diffusion tensor imaging (DTI). Little is known about whether tract degeneration is associated with the clinical symptoms of PSP.

Aim: To use DTI to assess tract degeneration in PSP and to investigate correlates with clinical measures.

Methods: Twenty probable PSP subjects and 20 controls with DTI were recruited. PSP subjects were tested with the Frontal Behavioral Inventory to assess behavioral change; the PSP Rating Scale to measure disease severity; the UPDRS to measure motor function; and the PSP Saccadic Impairment Scale to measure eye movement abnormalities. Fractional anisotropy and mean diffusivity were measured on DTI using region-of-interest analysis and Track-Based Spatial Statistics.

Results: Abnormal diffusivity was observed in superior cerebellar peduncles (SCP), body of the corpus callosum (CC), inferior longitudinal fasciculus (ILF) and superior longitudinal fasciculus (SLF) in PSP (Figure). Fractional anisotropy in the SCP correlated with disease severity; ILF correlated with motor function, and SLF correlated with severity of saccadic impairments.

Conclusions: These results demonstrate that PSP is associated with degeneration of brainstem, association and commissural fibers and that this degeneration likely plays an important role in clinical dysfunction.

[Figure]