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Titel des Beitrags: Validation of mobile eye-tracking as novel and efficient means for differentiating progressive supranuclear palsy from Parkinson’s disease.

Abstract: Background: The decreased ability to carry out vertical saccades is a key symptom of Progressive Supranuclear Palsy (PSP). Objective measurement devices can help to reliably detect subtle eye movement disturbances to improve sensitivity and specificity of the clinical diagnosis. The present study aims at transferring findings from restricted stationary video-oculography (VOG) to a wearable head-mounted device, which can be readily applied in clinical practice. Methods: We investigated the eye movements in 10 possible or probable PSP patients, 11 Parkinson’s disease (PD) patients, and 10 age-matched healthy controls (HCs) using a mobile, gaze-driven video camera setup (EyeSeeCam). Ocular movements were analyzed during a standardized fixation protocol and in an unrestricted real-life scenario while walking along a corridor. Results: The EyeSeeCam detected prominent impairment of both saccade velocity and amplitude in PSP patients, differentiating them from PD and HCs. Differences were particularly evident for saccades in the vertical plane, and stronger for saccades than for other eye movements. Differences were more pronounced during the standardized protocol than in the real-life scenario. Conclusions: Combined analysis of saccade velocity and saccade amplitude during
the fixation protocol with the EyeSeeCam provides a simple, rapid (<20 s), and reliable tool to
differentiate clinically established PSP patients from PD and HCs. As such, our findings prepare the
ground for using wearable eye-tracking in patients with uncertain diagnoses.