

Effects of emotional auditory stimulation on anticipatory postural adjustments in Parkinson's disease

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Introduction: The role of emotions on the Anticipatory Postural Adjustments (APA) in Parkinson's disease (PD) is still under debate [1], above all because their alterations are not studied outside the laboratory. Recently, a new method for quantifying APAs using an inertial measurements unit (IMU) was validated in elderly [2].

Objective: To investigate whether APA parameters from IMU after emotional stimuli differ between PD and controls subjects (CS).

Methods: Fourteen PD (71.1±5.7 years, mean UPDRS-III score 39.0±14.9) and eight age-matched healthy controls stood wearing headphones and an IMU on the lower back and were asked to initiate gait in response to neutral, pleasant and unpleasant auditory stimuli. As baseline condition a voice saying "start" was used. Patients were on the "on" state. APA onset and APA duration were calculated from the acceleration data [2]. The differences were tested using a repeated-measures ANOVA (Group: PD/CS, Stimuli: Baseline/Neutral/Pleasant/Unpleasant). Correlation analysis was performed between the APA parameters and UPDRS Part III using the Pearson test. Fisher's post-hoc test was applied for multiple comparison analysis.

Results: APA duration was longer in PD patients than in controls (p=0.01) and it was positively correlated with UPDRS III (rho 0.60, p=0.02) only at baseline. The emotional valence of the auditory stimulation affected APA onset (p=0.05), with the shortest values registered after the unpleasant stimuli. APA onset after N/P/U stimulations was significantly different compared to the baseline one.

Conclusions: The longer APA duration confirms an impaired postural control in PD. In addition, comparable APA onset between PD and CS suggests that the emotions recognition from common auditory stimuli of daily life is preserved in PD.

References

[1] Avanzino L, *Gait Posture* (2018) 65:57–64.

[2] Gazit E, et al. *Gait Posture*. 2020;76:128-135.

[3] Callisaya ML, et al. *Gait Posture*, 49 (2016), pp. 19-24.