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Development of a test for spatial working memory in Parkinson’s disease

Sensitivity to medication induced periodic performance changes

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Methods

The test consisted of six blocks of an n-back, yes/no task, with accuracy and latency of response automatically recorded. It was programmed using the Inquisit scripting langue (Millisecond Software) and deployed as a web application. The test is described by Figure 1.

Introduction

Working memory and visuospatial processing are known vulnerabilities in Parkinson’s disease (PD), often found as early as in Hoehn & Yahr stages 1 and 2. These functions are more impaired off than on dopaminergic medication.

Aim

To initialize development of a test capable of separating spatial working memory function levels of PD patients from that of healthy controls and to capture the variation within a patient’s daily functioning.

Results

The comparison between the two test persons, although confounded with a large age difference, showed the expected superiority for the HC in both reaction time and accuracy of target detection.

Correlations between the pass-band relating to the levodopa intake schedule and the full data were positive and significantly larger for the patient than for the HC. These differences applied to both latency and accuracy (Table 1) but were larger for accuracy. The correlations are illustrated by Figure 3.

Conclusions

The patient data contained a greater abundance of frequencies related to the medication schedule than the control data, which support the hypothesis that this test is able to detect levodopa-dependent variations in spatial working memory.