The parallel visual pathways in Parkinson's disease

Barboni, MTS[1,2], Feitosa-Santana, C[1,2,3,4], Moura, ALA[1,2], Felix, MM[5], Aguiar, PMC[5,6], Oiwa, NN[1,2], Gualtieri, M[1,2], Costa, MF[1,2], Ferraz, HB[7], Andrade, LA[5], Barbosa, ER[8], Amaro Jr., E[5,6], Silveira, LCL[9,10], Ventura, DF[1,2]

[1] Nucleo de Neurociencias e Comportamento, USP, Sao Paulo, Brazil
[2] Departamento de Psicologia Experimental, Insituto de Psicologia, USP, Sao Paulo, Brazil
[3] Psychology, University of Chicago, Chicago
[4] Visual Science Laboratories & Institute for Mind and Biology, University of Chicago, Chicago
[5] Instituto do Cerebro, Hospital Israelita Albert Einstein, Sao Paulo, Brazil
[6] NIF – LIM-44, Departamento de Radiologia, FM/USP, Sao Paulo, Brazil
[7] Departamento de Neurologia e Neurocirurgia, UNIFESP, Sao Paulo, Brazil
[8] Ambulatorio de Doencas Extra-Piramidais, Divisao de Clinica Neurologica, Hospital das Clinicas, FM/USP, Sao Paulo, Brazil
[9] Departamento de Fisiologia, Instituto de Ciências Biológicas, Universidade Federal do Pará, Belém, Brazil
[10] Núcleo de Medicina Tropical, Universidade Federal do Pará, Belém, Brazil

Motor effects of Parkinson's disease (PD) are well known but visual aspects are seldom studied. The aim of this study was to examine the effects of PD on the magnocellular (M) and parvocellular (P) visual pathways in a group of patients (n=28; mean= 50 ± 9 years old), using psychophysical tests designed to be selective for these pathways. This study also examined potential differences between early-onset PD patients (EOPD; n=19) and patients with PD onset between ages 45 and 65 (IPD; n=9). The M and P pathways were probed with computerized psychophysical tests: Pedestal Test (Pokorny & Smith, 1997; Gualtieri et al., 2006) and Checkerboard Test (Benoff et al., 2001; Costa & Ventura, 2005). The patients' results were compared with age-matched controls. Results. The Pedestal Test detected a difference between the PD group and the age-matched controls only for the M-pathway stimulus. For the Checkerboard Test, the PD group differed from the controls for both the M- and P-pathway stimuli. There was no relation between the duration of disease or medication and the PD patients' visual performance. The EOPD patients differed from controls for the M- and P-pathway stimuli in the Checkerboard Test. The IPD patients did not differ from the controls in any of the tests. Conclusion. Patients with PD showed impairment of functions probed by stimuli that activate the M or P visual pathway. Both psychophysical tests showed impairment of responses to M pathway stimuli; for the Checkerboard Test, a reduction in responses to the P-pathway stimuli was also found. The EOPD subgroup differed from the controls for both pathways in the Checkerboard Test while the IPD subgroup did not differ from the controls in any of the tests. This study reveals significant losses in visual performance in PD patients.

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