

Effect of education on cognitive decline in Parkinson's disease

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Introduction: Education is used as proxy measure of cognitive reserve. Recent evidence would suggest that higher levels of education would not slow cognitive decline in Alzheimer’s disease (AD) and healthy elderly subjects [1, 2]. It is unknown whether this is true in Parkinson's disease (PD). Therefore, in this longitudinal study, we sought to analyze the effect of education on cognitive changes of patients with PD.

Methods: A sample of PD patients having at least two evaluations performed one year apart, was stratified in three groups according to their education levels (i.e., junior high school; senior high school, university degree/higher). We calculated z-scores of three main cognitive domains (i.e., memory, visuo-spatial and attentional/executive domain). A composite score, used for measuring global cognition, was obtained by averaging the z-scores of cognitive domains and MOCA and MMSE scores.

The paired-sample T-test and the analysis of variance with repeated measures correcting for disease duration, motor disability at baseline and follow-up duration, were employed to analyze the cognitive changes over time in the entire sample and in the subgroups.

Results: We recruited 133 PD patients with a mean disease duration of 3.39 ± 3.94 years. At T₀ the groups did not differ for clinical and demographic variables. After a mean follow-up period of 2.11 ± 1.33 years, the whole sample significantly worsened in terms of global cognition and memory and visuospatial domain ($p < 0.05$). No significant differences were found between the subgroups stratified according to their education ($p > 0.05$).

Conclusion: Our results would suggest that education does not influence the degree of cognitive decline in PD patients, mirroring results in AD and in healthy elderly. However, since there has been suggestion that the protective effects of education is evident only in the earliest stage of AD to disappear in later stages [3], this must be investigated in patients with very early PD.

References:

- [1] Jansen MG, Geerligs L, Claassen JAHR, et al. Positive effects of education on cognitive functioning depend on clinical status and neuropathological severity. *Front Hum Neurosci.* 2021;15:723728. Published 2021 Sep 9. doi:10.3389/fnhum.2021.723728
- [2] Bruandet A, Richard F, Bombois S, et al. Cognitive decline and survival in Alzheimer's disease according to education level. *Dement Geriatr Cogn Disord.* 2008;25(1):74-80. doi:10.1159/000111693).
- [3] Ye BS, Seo SW, Cho H, et al. Effects of education on the progression of early- versus late-stage mild cognitive impairment. *Int Psychogeriatr.* 2013;25(4):597-606. doi:10.1017/S1041610212002001).