

## Efficacy of transcranial direct current stimulation on cognition in Parkinson's disease

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*Objective:* Parkinson's disease (PD) comprises a wide range of cognitive deficits from the earliest stage [1]. Since cognitive impairment significantly contribute to worse health-related quality of life (HRQoL) and there are no efficacious treatment options, there is the need for alternative approaches. The aim of this study is to provide an overview of the effects of tDCS on cognition in PD.

*Materials and methods:* We systematically reviewed the literature published on the use of tDCS for cognition in PD, identifying 17 eligible studies.

*Results:* A summary of the included studies is displayed [1]. In most studies (71%) tDCS was applied on the dorsolateral prefrontal cortex (DLPFC), while alternative stimulated areas included primary motor cortex, medial frontal cortex and the cerebellum. Although the majority of studies demonstrated an improvement of specific neuropsychological tests, especially exploring the executive functions, in most cases results were modest.

*Discussion:* Because cognitive impairment in PD most commonly involve executive functions [2], most studies focused on DLPFC stimulation, showing some modest results on executive outcomes. However, there is few consistency across the observed results and discrepancies between different studies have been identified and there is suggestion that the improvement also depend on the baseline cognitive status of patients. Studies are also heterogeneous in terms sample size, patients' characteristics, stimulation protocol and outcome measures.

*Conclusions:* tDCS could be efficacious in PD, perhaps in association with other interventions such as neurocognitive rehabilitation. However, more homogeneous studies, with larger samples and longer follow-up evaluations are necessary.

### References

- [1] Hasmet A., Hanagasi H.A., Tufekcioglu Z., Emre M. Dementia in Parkinson's disease. J Neurol Sci. 2017 Mar 15; 374:26-31.
- [2] Ding W., Ding L.-J., Li F.-F., Han Y., Mu L. Neurodegeneration and cognition in Parkinson's disease: a review. Eur Rev Med Pharmacol Sci. 2015 Jun;19(12):2275-81.