

Lomi, F., Simonelli, I., Cappa, S. et al. Noninvasive Brain Stimulation in Primary Progressive Aphasia with and Without Concomitant Speech and Language Therapy: Systematic Review and Meta-analysis. *Neuropsychol Rev* (2025).

<https://doi.org/10.1007/s11065-025-09659-5>

OPEN ACCESS

Abstract

Primary progressive aphasia (PPA) represent a group of neurodegenerative conditions affecting verbal communication abilities for which no effective medication is currently available. Noninvasive brain stimulation (NiBS) has been mainly explored as adjunctive therapy to conventional speech and language therapy (SLT) with promising results. The present meta-analysis of randomized-controlled trials (RCTs) aims to evaluate the efficacy of NiBS in PPA patients on a range of linguistic tasks (naming, phonemic fluency, semantic fluency). A literature search was carried out using EMBASE and PUBMED, searching for multi-session RCTs administering NiBS on PPA patients as stand-alone or with SLT. The results were not significant overall, indicating a null difference between the active and the sham condition on language functions; pooled effects tended to be higher in parallel than in crossover studies and for follow-ups than post-treatment. In the naming analyses, the combined effects for the studies that coupled NiBS with SLT were slightly higher than the overall effect at each time point, although not significant. These results need to be considered with caution given the low number of included studies and small sample sizes, but offer relevant indications for future research in terms of optimal treatment protocols and personalization of therapies.