LONG-TERM FOLLOW-UP OF ALZHEIMER’S DISEASE PATIENTS TREATED BY REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION COMBINED WITH COGNITIVE TRAINING.

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Background: Transcranial magnetic stimulation (TMS) is a technique for noninvasive painless brain stimulation. It generates a small electric current in the brain that induces, if applied repetitively (rTMS), a modulation in brain cortical excitability. rTMS has been explored as a potential novel therapeutic tool for different neuropsychiatric conditions. The objective of this study was to test the efficacy and long-term effects of rTMS interlaced with cognitive training (rTMS-COG), for the treatment of Alzheimer’s disease (AD) patients.

Patients and Methods: Eight AD patients, [DSM-IVR criteria; Mini Mental Status Examination (MMSE) of 18 to 24], were subjected to 30 daily sessions of rTMS while simultaneously performing COG tasks (45 minutes duration each; 6 weeks), followed by bi-weekly maintenance sessions for 3 more months, using the Non Invasive Cortical Enhancement (NICE®, Neuronix Ltd., Israel) System, which provides rTMS-COG. Six cortical brain regions (selected in each patient by brain MRI), were stimulated. COG was specifically developed according to the regions stimulated. Treatment effects were assessed using: Alzheimer’s Disease Assessment Scale - Cognitive (ADAS Cog (primary outcome)), Alzheimer’s Disease Assessment Scale-Activities of Daily Living (ADAS ADL), MMSE and Clinical Global Impression of Change scale (CGIC). Patients were also evaluated after 9 months.

Results: ADAS-cog results showed average improvements of -4.2 points after 6 weeks and -4.0 points after 4.5 months (p< 0.01 and p< 0.05 respectively). CGIC at the end of the treatment period was 2.87 on average. ADAS ADL and MMSE did not change. No side effects were reported, and patient participation remained high throughout the entire study. ADAS-cog change after 9 months follow-up of 7 pilot patients (4.5 months with treatment and 4.5 without, 1 drop out) was -2.78 from the baseline.

Conclusion: We conclude that the treatment of cognitive functions by NICE® system in AD patient is promising and may last beyond the treatment period.