

Received: 21.09.2009
Accepted: 28.11.2009

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REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (rTMS): A USEFUL TOOL ALSO FOR PATIENTS SUFFERING FROM DYSLEXIA?

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SUMMARY

Wanzek & Vaughn (2008) have reported that improvement of reading fluency depends on the amount of time in reading intervention. For that reason it can be assumed that brain stimulation – psychological or biological – could improve reading fluency. The purpose of our study was to verify the therapeutic effectiveness of repetitive Transcranial Magnetic Stimulation (rTMS) at a low frequency in a subject affected by dyslexia, with particular attention to the presence of possible correlations between the right and left dorsolateral prefrontal cortex and the severity of the symptomatology.

Key words: *learning disabilities, dorsolateral prefrontal cortex, low frequency TMS*

INTRODUCTION

Wanzek & Vaughn (2008) report that improvement of reading fluency depends on the amount of time in reading intervention. For this reason it can be assumed that brain stimulation – psychological or biological – could improve reading fluency.

It has been reported that the right and left dorsolateral prefrontal cortex play a critical role in recognition memory (Turriziani et al., 2008). This area is important for the integration and coordination of inputs (Dumontheil et al., 2008). Patients suffering from autism, attention deficit hyperactivity disorder, and schizophrenia, among other things, show dysfunction especially in this area. A recent observation (Niederhofer, 2008) showed that rTMS may be an useful add-on therapy for patients suffering from attention-deficit hyperactivity disorder. These facts suggest that rTMS might also be a useful tool for patients suffering from dyslexia.

To date research results have been limited by the low specificity of the diagnostic criteria used, and by the absence of specific biological markers. Fregni et al. (2005) describe good efficacy of Transcranial Magnetic Stimulation in depressive patients who respond to psychopharmacological treatment.

CASE REPORT

The purpose of our study was that to verify the therapeutic effectiveness of repetitive Transcranial Magnetic Stimulation (rTMS) at a low frequency (1Hz, 1200 stim/day for five days), applied on the scalp above the right and left dorsolateral prefrontal cortex, in a subject affected by dyslexia, with particular attention to the presence of possible correlations between these areas and the gravity of the symptomatology. The 34-year-old female patient (IQ 87) was not suffering from any additional disorders, nor was she taking any psychoactive substances. rTMS was applied for 5 days, and then, 6 months later, we performed an identical trial (placebo), but without activating the coil. The teacher's ratings (Landerl et al., 1997) were significantly better under rTMS treatment (14 reading errors before rTMS, 10 under placebo, 6 after rTMS, 17 writing errors before rTMS, 14 under placebo, 10 after rTMS). The neurophysiological parameters, especially EEG, did not show any significant change.

CONCLUSION

This observation suggests that dyslexia may be improved by rTMS. Further studies are required to confirm these results.

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