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Repetitive Transcranial Magnetic Stimulation (rTMS) to Treat Social Anxiety Disorder: Case Reports and a Review of the Literature

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Abstract: *Objectives:* Social anxiety disorder (SAD) is a common and debilitating anxiety disorders. However, few studies had been dedicated to the neurobiology underlying SAD until the last decade. Rates of non-responders to standard methods of treatment remain unsatisfactorily high of approximately 25%, including SAD. Advances in our understanding of SAD could lead to new treatment strategies. A potential non invasive therapeutic option is repetitive transcranial magnetic stimulation (rTMS). Thus, we reported two cases of SAD treated with rTMS *Methods:* The bibliographical search used *Pubmed/Medline, ISI Web of Knowledge* and *Scielo* databases. The terms chosen for the search were: anxiety disorders, neuroimaging, repetitive transcranial magnetic stimulation. *Results:* In most of the studies conducted on anxiety disorders, except SAD, the right prefrontal cortex (PFC), more specifically dorsolateral PFC was stimulated, with marked results when applying high-rTMS compared with studies stimulating the opposite side. However, according to the "valence hypothesis", anxiety disorders might be characterized by an interhemispheric imbalance associated with increased right-hemispheric activity. With regard to the two cases treated with rTMS, we found a decrease in BDI, BAI and LSAS scores from baseline to follow-up. *Conclusion:* We hypothesize that the application of low-rTMS over the right medial PFC (mPFC; the main structure involved in SAD circuitry) combined with high-rTMS over the left mPFC, for at least 4 weeks on consecutive weekdays, may induce a balance in brain activity, opening an attractive therapeutic option for the treatment of SAD.

Keywords: Dorsolateral prefrontal cortex, medial prefrontal cortex, repetitive transcranial magnetic stimulation, social anxiety disorders, valence hypothesis.

INTRODUCTION

Social anxiety disorder (SAD) is one of the most common anxiety disorders, characterized by fear and avoidance of social situations [1]. SAD can be divided into two subtypes: specific and generalized SAD. Specific SAD refers to the fear and avoidance of a particular performance situation such as public speaking, while generalized SAD refers to fear and avoidance of a wide array of social situations, with subsequently stronger impairing effects as compared to specific SAD [1]. SAD is very debilitating and despite its high prevalence [2, 3], little attention had been dedicated to the study of the neurobiology underlying SAD until the last decade [4]. However, with the considerable increase in the number of studies in the last years, aiming to elucidate the physiopathological aspects of SAD [5,6], together with clini-

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