

Background: Utilizing biomarkers to predict TMS outcomes with major depressive disorder (MDD) could optimize care. One potential cognitive biomarker is reaction time to negative facial expressions, which may be faster in MDD patients compared to controls. The objective of this study was to test whether baseline reaction time to negative faces is predictive of response to TMS in MDD.

Methods: Mean reaction time on negative facial expressions (Perception of Emotions Test, CNS Vital Signs) was assessed at baseline in 15 patients. Standard TMS treatment was then administered (120% of motor threshold, left dorsolateral prefrontal cortex) with 5 sessions/week for 6 weeks. The patients' improvement in QIDS depression score after TMS was assessed.

Results: With a linear regression analysis, with reaction time to negative faces as the independent variable and change in QIDS score as the dependent variable, there was a significantly non-zero correlation between the two ($F=7.576$, $p=0.017$). Faster baseline reaction time to negative faces was significantly correlated with a greater change in QIDS score with TMS treatment, with 36.82% of the variance explained ($R^2=0.3682$).

Conclusions: We found that reaction time to negative facial expressions before TMS treatment was predictive of improvement in depression after TMS treatment. The faster the baseline reaction time to negative faces, the greater the response to TMS. Patients with MDD may have a negative affective bias and respond faster to negative faces; this study suggests that MDD patients with a greater negative affective bias are more likely to respond to TMS.

Conflicts of Interests: None to Report

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