

Effects of electroconvulsive therapy (ECT) on anti-suicidal response and its potential neuroplastic mechanism: a GEMRIC mega-analysis

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INTRODUCTION

Suicide is one of the leading causes of mortality worldwide, nearly 800,000 people die due to suicide yearly, which is one person every 40 seconds. Electroconvulsive therapy (ECT) is the most effective neurorecovery treatment in psychiatry and it is especially indicated for patients with an elevated suicide risk.

PURPOSE OF STUDY: To assess the relationship between ECT-induced neuroplastic changes, and anti-suicidal response in a cohort of patients with depression from the Global ECT-MRI Research Collaboration (GEMRIC).

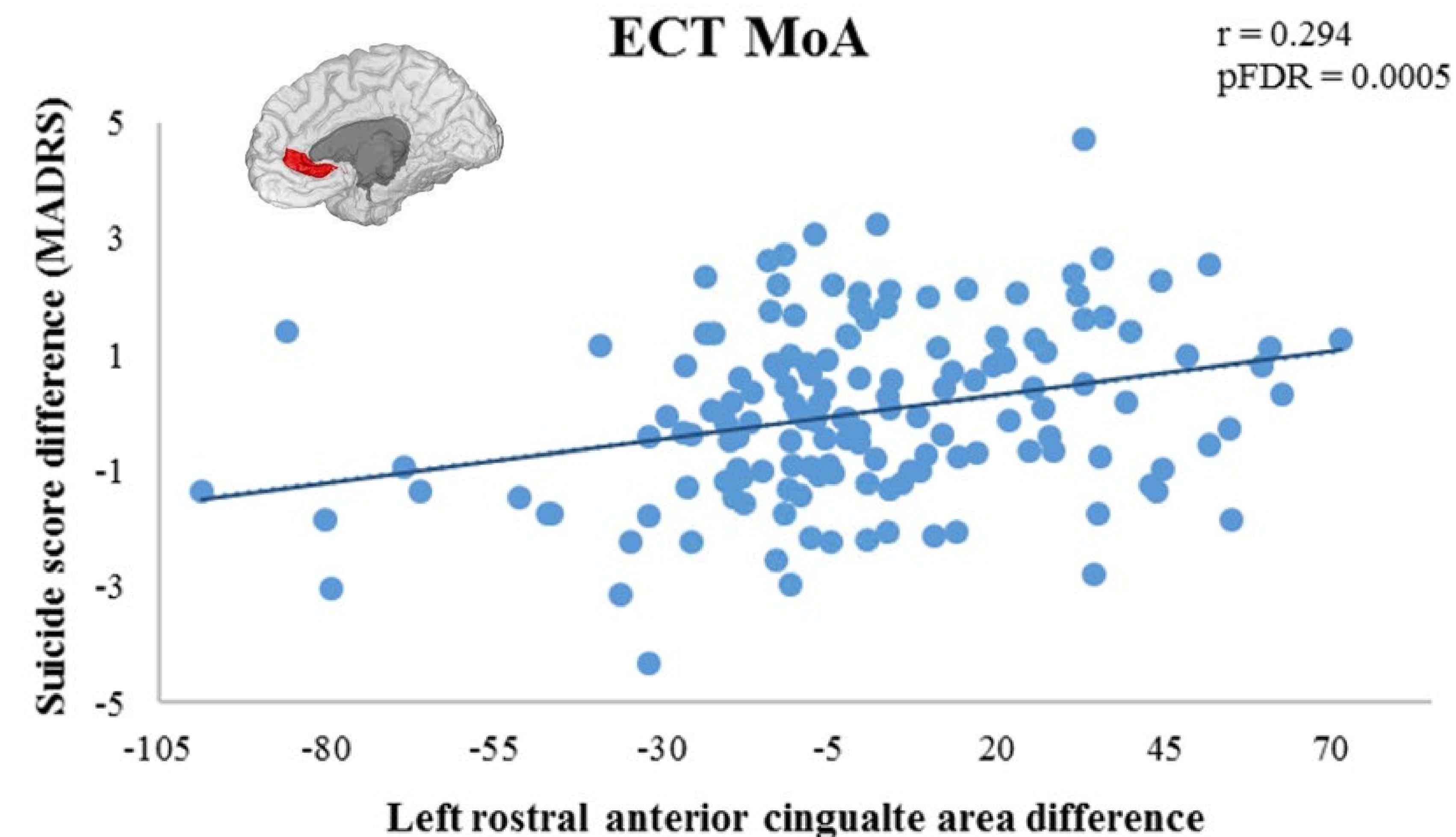
METHODS

❖ We evaluated 148 patients with depression before ECT initiation and after ECT completion using structural magnetic resonance imaging (i.e., Freesurfer 7.1.1 surface area calculation) and the Montgomery-Åsberg Depression Rating Scale (MADRS) suicide item (score ≥ 1 at baseline).

❖ The association between anti-suicidal response (MADRS suicide pre-ECT – MADRS suicide post-ECT) and brain structure (areas post-ECT – areas pre-ECT) was assessed with Pearson correlation analyses.

RESULTS

The surface area increase of the left rostral anterior cingulate cortex (rACC) was positively associated with the anti-suicidal response after ECT.



CONCLUSION

Our findings are in agreement with previous research highlighting rACC alterations as underlying mechanisms of the dysfunctional behavioral/emotional control characteristic of patients with suicidal risk. Importantly, our analyses identified the rACC neuroplastic changes as a putative mechanism for anti-suicidal response. These results emphasize the importance of a symptom-specific and circuit-based strategies to study neuroplasticity and neurorecovery therapies.

SUICIDE ELECTROCONVULSIVE THERAPY
NEUROPLASTICITY
MECHANISMS OF ACTION



Understanding the mechanisms of action for the ECT anti-suicidal response should support the development of novel anti-suicidal therapies that engage neuroplastic processes.