SHOCKING COMPASSION: EXAMINING THE CAUSAL ROLE OF THE VAGUS NERVE IN COMPASSIONATE AND MINDFUL STATES USING NONINVASIVE ELECTRICAL NEUROSTIMULATION

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Background: The vagus nerve (VN) regulates essential vegetative physiological functions. Psychophysiological studies and theoretical accounts indicate additional roles for the VN in goal-directed behavior and social-affiliative capabilities, including 'contemplative abilities. However, empirical evidence for this latter role is indirect and generally weak.

Aims: To examine the causal role of VN activation in generating or modulating contemplative states, namely (self-)compassion and mindfulness.

Method: Using a 2x2 factorial experimental design, we tested the effects of daily active transcutaneous VN stimulation (active-tVNS) or sham stimulation (sham-tVNS) combined with either daily compassionate imagery meditation or a credibility-matched control imagery training task. Participants were healthy adult volunteers (n = 30/group; total n = 120).

Preliminary results: Although we did not detect effects on our preregistered primary outcomes (state self-compassion, self-criticism, and heart rate variability), we found that active stimulation was associated with increased between-session trait compassion and within- and between-session state mindfulness.

Conclusions: Our findings are the first direct demonstration of a causal role for vagal activation in contemplative capabilities and suggest that electroceutical techniques can be used to induce or augment these capabilities therapeutically.

Keywords: Compassion, Mindfulness, Vagus nerve, Neurostimulation, tVNS

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