

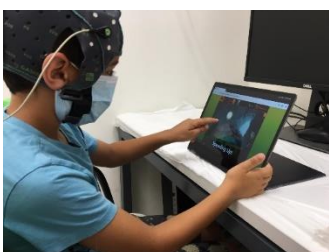
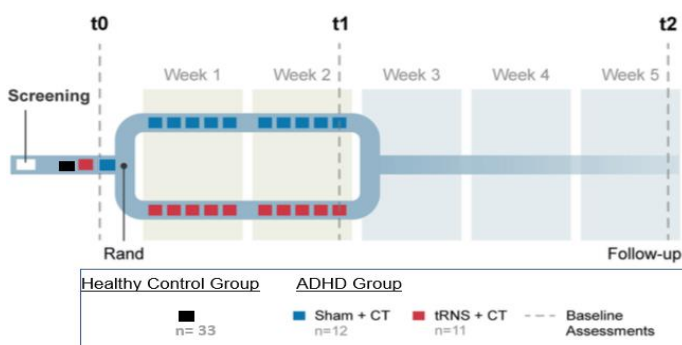
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INTRODUCTION

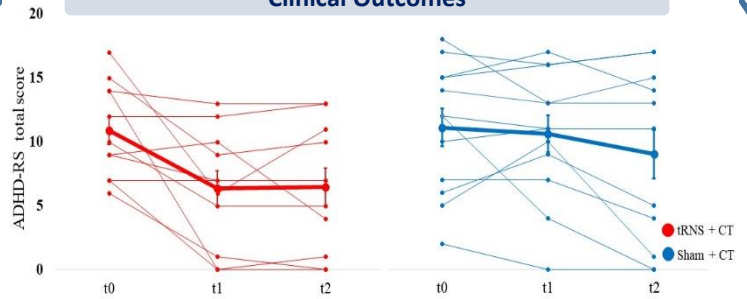
- Attention-deficit/hyperactivity disorder (ADHD) is a prevalent neurodevelopmental disorder characterized by deficits in attention, impulse control, and executive function.
- While pharmacological treatments can be effective, they often come with side effects and do not address underlying neural mechanisms.
- ADHD is associated with an imbalance in neural excitation and inhibition (E/I balance), measurable through electroencephalographic (EEG) markers such as the aperiodic exponent.
- The aperiodic exponent, derived from power spectral analysis, reflects the excitation-inhibition dynamics of cortical circuits and has emerged as a promising neurophysiological marker in psychiatric conditions.
- This study explores the potential of transcranial random noise stimulation (tRNS), a form of non-invasive brain stimulation, as a novel intervention to modulate neural activity and improve clinical outcomes in children with ADHD.
- We hypothesized that tRNS would improve clinical symptoms and normalize EEG-based E/I markers in children with ADHD.

METHODS

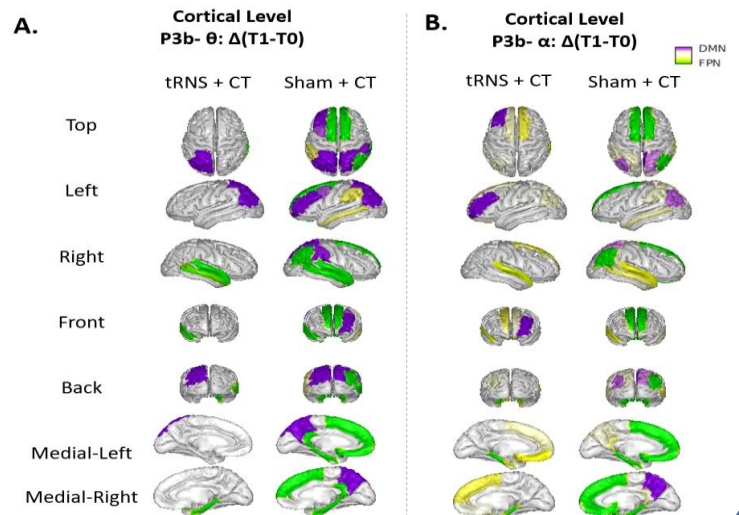
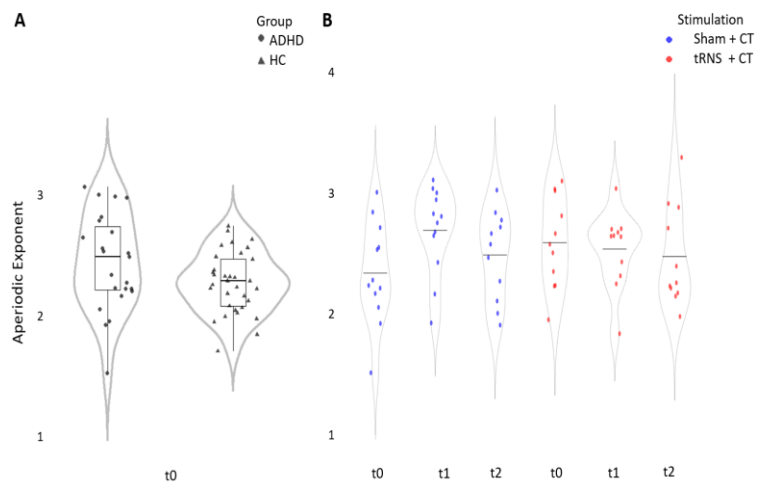


RESULTS

Clinical Outcomes



Neural Outcomes



DISCUSSION

The results highlight the potential of tRNS as a non-invasive, non-pharmacological intervention for modulating brain function and improving clinical outcomes. Support the utility of EEG-based aperiodic measures as biomarkers for monitoring intervention effects in ADHD.

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REFERENCES

1. Greydanus, D.E., et al., Dis Mon, 2007; 2. Barkley, R.A. Psychological Bulletin, 1997; 3. Brown, T.E., Current Attention Disorders Reports, 2009; 4. Ains et al., J. of Attention Disorders, 2011; 5. Snyder, S.M., & Hall, J.R., Journal of Clinical Neurophysiology, 2006; 6. Liu et al., NeuroImage, 2014; 7. Angelidis et al., Biological Psychology, 2016; 8. Hartly and Cohen Kadosh, Psychological Science, 2019; 9. Jarrett et al., J. of Attention Disorders, 2020; 10. DuPaul et al., Psychol Assess, 2016; 11. Gioia et al., 2002; 12. Berger et al., Arch Clin Neuropsychol, 2017; 13. A Delorme & S Makeig, J. of Neuroscience Methods, 2004.