Aligning Dimensions of Interoceptive Experience in Functional Seizures (ADIE-FS): An open feasibility study

Rachel Dean, Sarah Garfinkel, Jess Eccles, Dot Bindman, Huge Critchley, Mahinda Yogarajah

[1]Queen Square Institute of Neurology, [2]Institute of Cognitive Neuroscience, [3] Brighton & Sussex Medical School (BSMS)

Introduction

Functional Seizures (FS) are common, costly and harmful. There is a need to develop mechanistically based treatments that reduce seizure frequency and severity.

Recent research suggests that interoception – how the nervous system senses, interprets, and integrates information from inside the body – is altered in FS[1]. Individuals with FS have an interoceptive mismatch that correlates with seizure frequency. They have both reduced sensitivity to bodily signals, and limited insight into their perceptual accuracy.

Research by Quadt et al.[2], found that interoceptive training using a novel therapy – **Aligning Dimensions of Interoceptive Experience (ADIE)** – reduced anxiety with patients with autism in comparison to healthy controls by improving regulatory control over internal stimuli.

ADIE targets the mismatch between subjective and objective behavioural measures of an individual's interoceptive sensitivity to their heartbeat. It combines two modified heartbeat detection tasks with performance feedback before and after brief physical activity. The exercise temporarily increases cardiac arousal and therefore, makes it easier to appraise cardiac bodily signals..

Anxiety and dissociation are often discussed in relation to the development and maintenance of FS. Therefore, interoceptive training is an exciting treatment avenue to explore for FS.

Aim

Primary: To demonstrate the feasibility of an intervention based on Aligning Dimensions of Interoceptive Experience in individuals with FS (ADIE-FS).

Secondary: To explore the potential of ADIE-FS to improve the interoceptive sensitivity / insight in participants with FS and reduce seizure frequency / severity.

Method

Patients with diagnosed FS attending neurology outpatient clinics who expressed an interest in the study were screened according a range of criteria.

Exclusion criteria included:

- Age < 18 years.
- Moderate to severe cognitive impairment.
- Major psychiatric disorder diagnosis..
- Current substance or alcohol dependence.
- Cardiovascular difficulties.
- Uncontrolled asthma.

Screened participants (Target N=20) who were contacted and wanted to take part were randomly assigned to receive either six sessions of ADIE, or treatment as usual.

All participants completed baseline measures at three timepoints: initial T0, 6-week follow up T1, and 3-month follow up T2.

Interim Results

All 20 participants have now been enrolled. Thirteen participants have completed all aspects of the study. Three participants are awaiting 3-month follow-up in April, and one is awaiting six-week and 3-month follow-up.

Three participants stopped attending the study. Reasons for discontinuing were due to an unrelated health condition (N=1 intervention) and due to an increase in seizure frequency unrelated to the interoceptive training (N=1 intervention, N=1 waiting list).

Initial impressions in terms of feasibility are promising with 84% of participants expected to complete all aspects of the trial, and almost half (N=9) travelling for over two hours to attend appointments despite minimal financial reimbursement being available.

Responses on the client satisfaction questionnaire for intervention participants have been overwhelmingly positive with two participants reporting that ADIE helped them to become aware of, hitherto unrecognized, seizure warnings signs leading to a decrease in seizure frequency.

Conclusion

Initial data suggests ADIE-FS is a feasible intervention for FS. It is acceptable to participants, with no participant drop out as a direct result of this intervention.

We envisage completion of the study and publication of the data and results in 2025.

References

1. Koreki et al. Trait and state interoceptive abnormalities are associated with dissociation and seizure frequency in patients with functional seizures, Epilepsia 2020

2. Quadt et al. Interoceptive training to target anxiety in autistic adults (ADIE): A single-center, superiority randomized controlled trial, eClinical Medicine 2021

Contact: Dr Mahinda Yogarajah

Email: m.yogarajah@ucl.ac.uk

Contact: Dr Rachel Dean

Email: rachel.dean@southernhealth.nhs.uk

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