

EluCidATe: Exploring pain and autonomic dysfunction in Chronic Fatigue Syndrome/Myalgic Encephalomyelitis and Temporomandibular disorders

Elizabeth Offen, James R Allison, Antonia Stergiou, Quoc Vuong, Justin Durham

INTRODUCTION

- Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) causes debilitating fatigue and chronic pain.
- TMD may be comorbid in up to 1 in 3 people with ME/CFS, and the mechanism is poorly understood.¹
- Autonomic Nervous System (ANS) dysfunction is common in both ME/CFS and TMD.²
- Non-invasive vagus nerve stimulation (nVNS) can reduce sympathetic ANS activity & is used to treat migraine and cluster headache.

AIMS

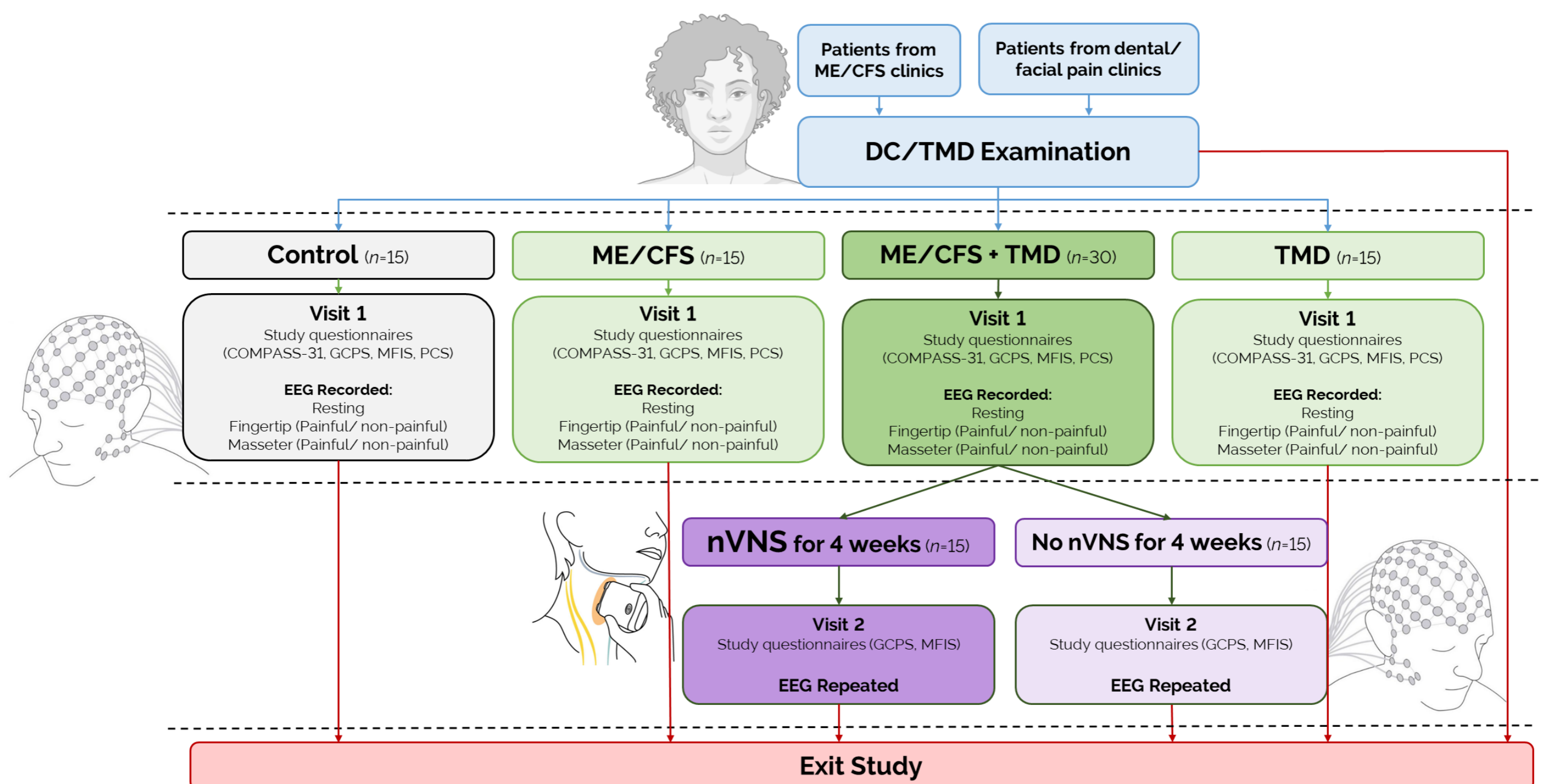
- To further understand pain in ME/CFS by comparing responses in the brain to pain in groups with differing burdens of painful symptoms
- To examine the role of the ANS in pain using nVNS

METHODS AND ANALYSIS

- Experimental study: 75 participants in 4 groups (Fig 1).
- Brain activity measured using electroencephalography (EEG) during application of painful pressure to fingertip, and masseter muscle. EEG power-spectrum analysis to compare groups.
- Brain regions generating EEG activity localised using LORETA source analysis.
- nVNS stimulation provided to half (n=15) of ME/CFS+TMD group & EEG recording repeated at 4 weeks for both halves of group.

IMPORTANCE AND FUTURE DEVELOPMENT

- Findings may help us understand why some patients with ME/CFS experience more painful symptoms and why TMD is more common.
- Will help identify where in the brain any differences occur, and how the ANS contributes to pain thereby informing more detailed studies using MRI.
- By better understanding mechanisms, we hope this will lead to better treatments in the future.



COMPASS-31: Composite Autonomic Symptom Score; GCPS: Graded Chronic Pain Scale; MFIS: Modified Fatigue Impact Scale; PCS: Pain Catastrophising Scale; EEG: Electroencephalography; nVNS: non-invasive vagus nerve Stimulation

Figure 1. Schematic of study procedure and groups

REFERENCES: 1. Robinson LJ *et al.*. J Oral Rehabilitation. 2016;43(4):306-16.; 2. Vuong QC *et al.*. JDR Clinical and Translational Research. 2020;5(3):224-32.