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Heart rate variability biofeedback therapy and graded exercise training in management of chronic fatigue syndrome: An exploratory pilot study

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ABSTRACT

Objective: Chronic fatigue syndrome (CFS) is characterised by persistent fatigue, exhaustion, and several physical complaints. Research has shown cognitive behavioural therapy (CBT) and graded exercise training (GET) to be the most effective treatments. In a first step we aimed to assess the efficacy of heart rate variability biofeedback therapy (HRV-BF) as a treatment method comprising cognitive and behavioural strategies and GET in the pilot trial. In a second step we aimed to compare both interventions with regard to specific parameters.
Methods: The study was conducted in an outpatient treatment setting. A total of 28 women with CFS (50.3 ± 9.3 years) were randomly assigned to receive either eight sessions of HRV-BF or GET. The primary outcome was fatigue severity. Secondary outcomes were mental and physical quality of life and depression. Data were collected before and after the intervention as well as at a 5-month follow-up.
Results: General fatigue improved significantly after both HRV-BF and GET. Specific cognitive components of fatigue, mental quality of life, and depression improved significantly after HRV-BF only. Physical quality of life improved significantly after GET. There were significant differences between groups regarding mental quality of life and depression favouring HRV-BF.
Conclusion: Both interventions reduce fatigue. HRV-BF seems to have additional effects on components of mental health, including depression, whereas GET seems to emphasise components of physical health. These data offer implications for further research on combining HRV-BF and GET in patients with CFS.
Trial registration: The described trial has been registered at the International Clinical Trials Registry Platform following the number DRKS00005445.

1. Introduction

Chronic fatigue syndrome (CFS) is characterised by intense, disabling fatigue persisting more than six months that is not explained by on-going exertion or organic disease and that cannot be alleviated within a normal period by rest or distraction [1,2]. In addition, several physical or somatic symptoms, such as muscular pain, dizziness, headache, sleep disorder, inability to relax and/or irritability have to exist [3]. The prevalence of CFS varies widely depending on disease definition, but it is assumed that the syndrome could affect 1% of the adult population [1], and is more often seen in women and in adults [4,5,6]. Furthermore, there is an increased risk of completed suicide in patients with CFS [7]. Until now, no distinct agents either exclusively physiological or exclusively psychopathological have been identified [8]. Most promising theoretical concepts assume that the experience of fatigue and chronic physical symptoms combined with loss of functioning is influenced by multiple biological, affective, behavioural, cognitive, and social factors [6,8,9]. Wyller et al. [10] proposed a model of sustained arousal in patients with CFS based on the cognitive activation theory

Abbreviations: APT, adaptive pacing therapy; BF, biofeedback; BMI, body-mass index; CBT, cognitive behavioural therapy; CDC, Centers for Disease Control and Prevention; CFS, chronic fatigue syndrome; EEG, Electroencephalography; EMG, Electromyography; FSS, functional somatic syndromes; GET, graded exercise training; HRV, heart rate variability; MFI, Multidimensional Fatigue Inventory; RSA, respiratory sinus arrhythmia; SCID, structured clinical interview; SD, standard deviation; SDS, Somatoform Disorder Schedule; SF36, Short Form General Health Survey; SMC, specified medical care; QoL, quality of life.

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