INTERRUPTED COMPARED TO GRADED EXERCISE FOR INDIVIDUALS WITH CHRONIC FATIGUE SYNDROME: a 12 Week Pilot Study

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Introduction: There is evidence that graded exercise (GE), with/without cognitive behavioural therapy, has positive effects on some CFS symptoms and health. Intermittent exercise training (IE) has not been trialed for CFS but is successful for COPD and cardiac disease. This 12-week RCT investigated the efficacy of IE compared to GE for CFS participants.

Methods: Pre- and post-intervention outcome measures included anthropometry; resting and peak heart rate, blood pressure and O2sat; VO2peak, VE, power and RPE; anaerobic threshold (AT); elapsed test time (ETT); Fatigue Severity Scale scores.

24 participants (50.9 ± 10 yr) were randomised to a non-exercising Usual Care group (n=8), an IE (n=8) or GE group (n=8). Supervised cycle ergometer sessions, 3 x week, were at a workload equivalent to 50% VO2peak, steady state (GE) or 1-min intervals at 30%/60% VO2peak (IE) with a 5-min, unloaded cycling warm up and cool down. IE or GE duration began at 5 min then progressed as symptoms permitted, until 30 min exercise in total was achieved.

Intensity was not increased until participants managed 3 consecutive 30-min sessions with no symptom exacerbation. Self-reported Ratings of Tiredness were completed immediately post-exercise and 24 h post-exercise session (0-10 Likert scale, “no tiredness” – extremely tired”).

Results: Significant post-intervention increases for both IE and GE groups in VO2peak (p=0.023, p=0.048), time to AT (p=0.049, p=0.047) and AT VO2 (p=0.006, p=0.034). VEpeak (p=0.004) and ETT (p=0.027) improved significantly for the IE group only (Table 1). Compared to Week 0, Week 12 tiredness scores were significantly higher in the GE group (p = 0.03) but not in the IE group (p = 0.06). Mean total GE tiredness scores 24 h post-exercise were significantly greater (p = 0.024) than scores immediately post-exercise; IE scores were not different (p = 0.095) (Figure 1). Fatigue severity did not change for either group.

Conclusions: Both GE and IE increased aerobic capacity, most likely through peripheral adaptations[1,2,3], with no worsening of symptoms. The IE results may be due to exercise sessions that included relatively more work (i.e. longer session duration)[2] than GE for some participants. Intermittent unloaded / low-intensity intervals may cause less tiredness 24-h post-exercise, and produce less long-term tiredness compared to GE, possibly due to reduced use of anaerobic metabolism, compared to constant load GE[3,4,5,6]. IE may be an equally effective but more manageable exercise modality compared to GE for CFS individuals.

Figure 1: Mean total for 12 weeks self-reported tiredness scores for GE and IE immediately post-exercise and 24 h post-exercise

### References

[1] Arnodottir et al., 2007
[2] Clapp et al., 1999
[5] Smart & Steel 2012
[6] Vogiatzis et al., 2002

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