

Ventilatory Functioning During Serial Cardiopulmonary Exercise Testing in People With and Without Myalgic Encephalomyelitis/Chronic Fatigue Syndrome

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Background: Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) is associated with activity-dependent reductions in metabolic and cardiac functioning, which in turn are associated with symptoms and signs of post-exertional malaise (PEM). However, ventilation at rest and with physical exertion in people with ME/CFS have not yet been quantified and compared to people without ME/CFS.

Objectives: To quantify ventilatory functioning at rest and during activity in people with and without ME/CFS

Methods: Each subject received 2 maximal CPETs on a braked bicycle ergometer that were administered 24 hours apart. Throughout each test, measurements of breath-by-breath gas samples, workload, heart rate, breathing rate, tidal volume, end tidal oxygen, and end tidal carbon dioxide were taken at rest, ventilatory anaerobic threshold (VAT), and peak exertion. Statistical analysis consisted of 2-way analysis of variance (group by test). Criterion for statistical significance of differences was $\alpha \leq .05$.

Results: Subjects were 37 women with ME/CFS and 38 sedentary women without ME/CFS. The groups did not differ in age and body mass index. There were significant main effects for group indicating lower measurements for workload, volume of oxygen consumed, and heart rate at VAT and peak. Breathing rate demonstrated significant main effects for group with lower measurements in the ME/CFS group at peak exertion. Minute ventilation and tidal volume also demonstrated significant main effects for group with lower in the ME/CFS group at VAT and peak exertion. There were significant main effects for test 1 versus test 2 for end tidal oxygen at rest, VAT, and peak; and for end tidal carbon dioxide for rest and peak. There were no significant group by test interaction effects for any measurement obtained.

Conclusions: People with ME/CFS demonstrate abnormal pulmonary measurements on CPET that may correlate with abnormal metabolic and cardiac functioning. Potential effects on pulmonary function of short-term PEM induced by CPET remain unclear.

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