Post-Exertional Malaise

ME/CFS Post-Exertional Malaise / Fatigue and Exercise

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Post-exertional malaise and/or fatigue of inappropriate severity can temporarily immobilize the patient and worsen her/his symptoms following normal physical or mental activity. It takes the patient an inordinate amount of time to recover – 24 hours or more.(1,2,3,) De Becker et al (4) assessed 2073 consecutive patients with major complaints of prolonged fatigue. Of the 1578 patients that met the Fukuda criteria,(2) 97.3% had post-exertional malaise with a severity of 2.7 out of three. Of the 951 who met the Holmes criteria,(3) 98.8% had post-exertional malaise with a severity of 2.8 out of 3. Post-exertional malaise and/or fatigue are necessary criteria in the Clinical Case Definition for ME/CFS.(1)

Even though post-exertional malaise is a hallmark feature of ME/CFS, exercise programs are often prescribed with little thought to the effect they may have on patients. The panel of experts for the ME/CFS clinical consensus document(1) stressed that a thorough evaluation of patients and their total illness burden, optimizing medical management, and a careful evaluation of pain generators and risk factors must be done before even considering an exercise program. As much care must be taken in prescribing appropriate exercise for ME/CFS patients as in prescribing pharmaceuticals.(5)

ME/CFS patients do not respond to exercise in a manner that is expected of healthy people. The following chart summarizes some of the abnormal reactions to exercise which ME/CFS patients often experience.

Response to Exercise	Healthy People	ME/CFS Patients
Sense of well-being	**Invigorating Anti-depressant effect**	**Feel malaise, fatigue and worsening of symptoms**
Resting heart rate	**Normal**	**Elevated**
Heart rate at maximum workload	**Elevated**	**Reduced heart rate**
Maximum oxygen uptake	**Elevated**	**Approximately ½ of sedentary controls**
Age-predicted target heart rate	**Can achieve it**	**Can NOT achieve it**
Heart functioning	**Increased**	**Sub-optimal level**
Cerebral blood flow	**Increased**	**Decreased**
Cerebral oxygen	**Increased**	**Decreased**
Body temperature	**Increased**	**Decreased**
Respiration	**Increased**	**Breathing irregularities: shortness of breath, and irregular breathing**
Cognitive processing	**Normal, or more alert**	**Impaired**
Recovery period	**Short**	**At least 24 hours but can last days or even weeks**
Oxygen delivery to themuscles	**Increased**	**Impaired**
Gait kinematics	**Normal**	**Gait abnormalities**

1. ME/CFS patients have lost the anti-depressant effect of exercise, and it can make them feel worse. Healthy people or those who are depressed receive an increased supply of blood and oxygen to the brain during exercise and they feel better afterwards. ME/CFS patients receive less blood and oxygen to the brain making them feel worse after exercise.(6,7)

2. While ME/CFS patients have elevated resting heart rates on average, they have a significantly reduced heart rate at maximum workload and an inability to reach the age-predicted target heart rates.(8,9) The maximum oxygen uptake and maximum workload attained by ME/CFS patients was only approximately half that of sedentary controls.(8) As this could be due to the heart functioning at a sub-optimal level and/or autonomic disturbances, patients should NOT be pushed towards age-predicted target heart rates,(9) as this is potentially DANGEROUS!

3. ME/CFS patients have hypoprofusion in specific areas of the brain.(10) SPECT scans indicate that exercise causes a further marked decrease in cerebral region blood flow, and a worsening of symptoms. Goldstein(11)used a SPECT scan to test pre-exercise and post-exercise hypoprofusion of the brains of CFS patients. There was resting hypoperfusion in the anterior temporal lobes

(more often in the right) and hypoperfusion in the prefrontal cortex. SPECT scans done both the same day after exercise and the following day showed there is usually a much greater degree of hypoperfusion after exercise.(11) This effect is the opposite of normal.

4. Body temperature normally increases with exercise. In ME/CFS patients, body temperature usually decreases in response to exercise,(7) which is the opposite of normal.

5. ME/CFS patients usually experience breathing irregularities during or immediately after exercise. Shortness of breath and irregular breathing are most common.(7) Automatic repiration is regulated by the limbic system.

6. Cognitive processing becomes more impaired in response to challenging physical exertion.(12)

7. Recovery period is prolonged. It takes at least 24 hours but can take several days or weeks or even longer to recover.(4) A long recovery period after exercise is included in the criteria for ME/CFS.(1,2,3)

8. Orthostatic intolerance, low circulating blood volume and blood pooling in the legs often play a role in post-exertional malaise and fatigue.(13)

9. Significantly impaired oxygen delivery and consumption levels during exercise have been reported.(8)

10. Gait abnormalities have been found in ME/CFS patients when compared to sedentary controls. These abnormalities may be due to balance problems, muscle weakness, or central nervous system dysfunction.(14)

Research studies on graded exercise for ME/CFS vary greatly in their inclusion and exclusion criteria and many subjects do not meet the criteria for ME/CFS. In the study by Fulcher and White,(15) which compared aerobic exercise to flexibility therapy, patients who had considerable sleep disturbance were excluded. This is puzzling, as sleep disturbance is a necessary criterion in the clinical definition.(1) In the De Becker et al study,(4) 94.8 of the 951 patients meeting the Holmes criteria(3) had sleep disturbance of 2.5 out of 3 average severity, and 91.9% of the 1578 patients meeting the Fukuda criteria,(2) reported sleep disturbance of an average of 2.4 out of 3 severity. This raises the question as to whether the results of the Fulcher and White study even apply to ME/CFS patients. Most graded exercise studies reviewed by Whiting et al,(16) used the Oxford criteria which are much less restrictive. Patients who meet this less restrictive definition may include patients who respond to exercise more positively and have a much better prognosis than those who meet the more restrictive criteria for myalgic encephalomyelitis / chronic fatigue syndrome. In a systematic review of prognosis of numerous studies, Joyce et al(17) concluded

that the less stringent the criteria, the better the prognosis. Therefore, it is of the utmost importance that patients meet all the criteria for ME/CFS or the validity of the study is in question.

In a British study,(5,18) 1214 of 2338 ME/CFS patients had tried graded exercise. Of these 416 found it to be helpful, 197 reported no change and 610 (50%) indicated that it mad their condition worse. This was the highest negative rating of any of the parmacological, non pharmacolgical and laternate approaches of management covered in the questionnaire and may explain the hich drop out rates noted in some of these programs.

It is essential that the treating physician and all other personnel involved with treatment progreams are very knowledgeable about the more discriminating creteria for ME/CFS, the biological reality of the illness with its severe and fluctuations of symptoms and activities boundaried and the overload phenomena. As the treating physician knows the patient best and s/he is responsible for the patient's ongoing care, s/he should oversee any exercise / rehabilitative programs. Exercise must be individualized to accommodate the patient's total illness burden, and fluctuation in severity and triggers of exacerbation. The patient must have autonomy over the pacing of any exercise program and be able to incorporate rest perilds as required. Great care must be taken in order that patients do not exceed their activity boundaries which fluctuate, as this can cause post-exertional relapse. The consensus document, "Myalgic Encephalomyelitis/Chronic Fatigue Syndrome: Clinical Working Case Definition, Diagnostic and Treatment Protocols"(1) has an excellent sectio non the goals and guidelines for individualizing ME/CFS exercise programs.

Bruce Carruthers, MD,CM, FRCP(C), kindly reviewed this article for medical accuracy. Dr. Carruthers was the lead author of the ME/CFS Consensus Document and co-editor of the FMS Consensus Document.

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In view that some ME/CFS patients may require stress tests, such as following a heart attack, the next issue of "Quest" had an article by Dr. Corning on an alternative pharmacological stress test, which is safer for ME/CFS patients