Eur J Clin Invest. 2012 Feb;42(2):186-94.

Loss of capacity to recover from acidosis on repeat exercise in chronic fatigue syndrome: a case-control study.

Jones DE, Hollingsworth KG, Jakovljevic DG, Fattakhova G, Pairman J, Blamire AM, Trenell MI, Newton JL.

BACKGROUND:

Chronic fatigue syndrome (CFS) patients frequently describe difficulties with repeat exercise. Here, we explore muscle bioenergetic function in response to three bouts of exercise.

METHODS:

A total of 18 CFS (CDC 1994) patients and 12 sedentary controls underwent assessment of maximal voluntary contraction (MVC), repeat exercise with magnetic resonance spectroscopy and cardio-respiratory fitness test to determine anaerobic threshold.

RESULT:

Chronic fatigue syndrome patients undertaking MVC fell into two distinct groups: 8 (45%) showed normal PCr depletion in response to exercise at 35% of MVC (PCr depletion >33%; lower 95% CI for controls); 10 CFS patients had low PCr depletion (generating abnormally low MVC values). The CFS whole group exhibited significantly reduced anaerobic threshold, heart rate, VO(2) , VO(2) peak and peak work compared to controls. Resting muscle pH was similar in controls and both CFS patient groups. However, the CFS group achieving normal PCr depletion values showed increased intramuscular acidosis compared to controls after similar work after each of the three exercise periods with no apparent reduction in acidosis with repeat exercise of the type reported in normal subjects. This CFS group also exhibited significant prolongation (almost 4-fold) of the time taken for pH to recover to baseline.

CONCLUSION:

When exercising to comparable levels to normal controls, CFS patients exhibit profound abnormality in bioenergetic function and response to it. Although exercise intervention is the logical treatment for patients showing acidosis, any trial must exclude subjects who do not initiate exercise as they will not benefit. This potentially explains previous mixed results in CFS exercise trials.