In vitro Study of Muscle Aerobic Metabolism in Chronic Fatigue Syndrome

Wilhelmina M.H. Behan, Senior Lecturer, Pathology, Glasgow University, Glasgow, Scotland, U.K.; Ian J. Holt, Royal Society University Research Fellow, Department of Biochemical Medicine, Ninewells Medical School, Dundee, Scotland, U.K.; David H. Kay, House Officer, Western Infirmary, Glasgow, Scotland, U.K.
Pamela Moonie, Research Assistant, Department of Biochemical Medicine, Ninewells Medical School , Dundee, Scotland, U.K. (1999)

Abstract:

The purpose of this study was to establish if muscle aerobic metabolism is abnormal in chronic fatigue syndrome (CFS). Myoblast cultures from muscle biopsies of 16 patients with CFS and 10 healthy controls were established. Micromethods were used to determine the lactate/pyruvate (L/P) ratio, respiratory chain function and cytochrome oxidase and lactic dehydrogenase activities. Mitochondrial DNA (mtDNA) volume was measured and mtDNA rearrangements sought. The results showed that myoblasts from ten of 16 cases of CFS had defects in aerobic metabolism: two had increased L/P ratios, suggestive of a defect in oxidative phosphorylation while eight had decreased ratios, consistent with a deficiency in pyruvate dehydrogenase. There was a statistically significant broader range of L/P ratios in the patients' cultures, compared to controls ($p = 0.011$). No mtDNA rearrangements were present. This in vitro study confirms that there is convincing evidence of mild aerobic defects in skeletal muscle in some cases of CFS.