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Chronic fatigue syndrome: new evidence for a central fatigue disorder.

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Considerable evidence points towards a prominent role for central nervous system (CNS) mechanisms in the pathogenesis of chronic fatigue syndrome (CFS), a disorder characterized chiefly by persistent, often debilitating, fatigue. We wished to characterize circulating profiles of putative amino acid modulators of CNS 5-hydroxytryptamine (5-HT; serotonergic) and dopaminergic function in CFS patients at rest, as well as during symptom-limited exercise and subsequent recovery. Groups of 12 CFS patients and 11 age- and sex-matched sedentary controls, with similar physical activity histories, underwent ramp-incremental exercise to the limit of tolerance. Plasma amino acid concentrations, oxygen uptake and ratings of perceived exertion were measured at rest, and during exercise and recovery. Peak oxygen uptake was significantly lower in the CFS patients compared with controls. Rating of perceived exertion in the patients was higher at all time points measured, including at rest, relative to controls. Levels of free tryptophan (free Trp), the rate-limiting 5-HT precursor, were significantly higher in CFS patients at exhaustion and during recovery, whereas concentrations of branched-chain amino acids (BCAA) and large neutral amino acids (LNAA) were lower in CFS patients at exhaustion, and for LNAA also during recovery. Consequently, the [free Trp]/[BCAA] and [free Trp]/[LNAA] ratios were significantly higher in CFS patients, except at rest. On the other hand, levels of tyrosine, the rate-limiting dopaminergic precursor, were significantly lower at all time points in the CFS patients. The significant differences observed in a number of key putative CNS 5-HT and dopaminergic modulators, coupled with the exacerbated perception of effort, provide further evidence for a potentially significant role for CNS mechanisms in the pathogenesis of CFS.

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