The Relevance of ASIC3, TRPV1 and P2X Receptors in Fibromyalgia and Chronic Fatigue Syndromes

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Fibromyalgia syndrome (FMS) and chronic fatigue syndrome (CFS) are disorders that are characterized by persistent pain and muscle fatigue that does not resolve after rest. The underlying cause of these two disorders has not been determined. Our recent study of patients with CFS and/or FMS provided evidence that both adrenergic and cytokine activity are altered in these patients. Preliminary research, using mice as models, indicated that neuronal signaling systems for muscle pain and fatigue after exercise are dependent upon specific ion channel receptors including ASIC3, TRPV1, and receptors in the P2X family. Therefore, it is hypothesized that the symptoms of both CFS and FMS may be caused by the metabolic dysregulation of ASIC3, TRPV1, and P2X4 and or P2X5. These alterations may be caused by or may be secondary to dysregulation of various metabolites including lactate, ATP, and changes in pH that these receptors detect. In order to determine the relationship between these specific receptors and their ligands in patients and control subjects, blood is drawn and analyzed before and at four specific time points following participation in a moderate physical exertion activity. CK, creatine kinase, and serological tests, along with real-time PCR are used to compare any changes in gene expression compared to the initial baseline values. Differences in the alteration of specific receptors by exercise in CFS/FMS patients in comparison to control subjects may provide us with objective physiological differences with which to diagnose these syndromes and may provide clues as to the causes of these syndromes which will aid in providing effective treatments for these debilitating diseases.