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Review Article

**Sympathetic Nervous System Dysfunction in Fibromyalgia, Chronic Fatigue Syndrome, Irritable Bowel Syndrome, and Interstitial Cystitis: A Review of Case-Control Studies**

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**Abstract**

Background: Fibromyalgia often coexists and overlaps with other syndromes such as chronic fatigue, irritable bowel syndrome, and interstitial cystitis. Chronic stress has been implicated in the pathogenesis of these illnesses. The sympathetic nervous system is a key element of the stress response system. Sympathetic dysfunction has been reported in these syndromes, raising the possibility that such dysautonomia could be their common clustering underlying pathogenesis.

Objective: The objective of this study was to carry out a review of all published comparative case-control studies investigating sympathetic nervous system performance in fibromyalgia, chronic fatigue syndrome, irritable bowel syndrome, and interstitial cystitis.

Methods: Online databases PubMed and EMBASE were accessed using the following key words: autonomic (OR) sympathetic (AND) fibromyalgia, chronic fatigue syndrome, irritable bowel syndrome, and interstitial cystitis. All entries up to December 10th 2012 were reviewed by 2 independent investigators searching for case-control studies in humans. The Method for Evaluating Research and Guidelines Evidence adapted to the Scottish Intercollegiate Guidelines Network was used to rank the level of evidence contained in the selected articles.

Results: A total of 196 articles are included in this review. The most often used methods to assess sympathetic functionality were heart rate variability analysis, sympathetic skin response, tilt table testing, and genetic studies. The majority of studies (65%) described sympathetic nervous system predominance in these overlapping syndromes. In contrast, 7% of the studies found parasympathetic predominance.

Conclusions: This review demonstrates that sympathetic nervous system predominance is common in fibromyalgia, chronic fatigue syndrome, irritable bowel syndrome, and interstitial cystitis. This concordance raises the possibility that sympathetic dysfunction could be their common underlying pathogenesis that brings on overlapping clinical features. The recognition of sympathetic predominance in these 4 syndromes may have potential clinical implications. It may be worth exploring the use of nonpharmacological measures as well as drug therapies aimed to regain autonomic balance.