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# Understanding pain of stress etiology, comprising changes in muscle excitability, hormones and the nervous system.

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Gösta Alfvén is a pediatrician and associate professor at Karolinska Institute. He presented his thesis concerning psychosomatic pain 1993 and has been involved in research concerning recurrent pain and stress for over 30 years. He has published more than 30 peer reviewed studies in these fields.

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## ABSTRACT

**Background:** Recurrent pain of stress etiology is a common, worldwide problem with impaired quality of life and decreased school attendance. Research show that pain of stress etiology, often called psychosomatic pain, often is a complex of multiple pains, other symptoms and augmented widespread muscular tension with a specific pattern of tender points (1).

**Objective and Method:** We will in a clinical context present electromyography (EMG) data, showing a novel and a missing link, regarding central and peripheral neurophysiological changes of significant importance for better understanding recurrent multiple pain.

**Results:** During high acoustic signals, the startle reaction was shown, via EMG, to be potentiated, more easily and more often elicited in several muscles related to the pain, in 19 children with recurrent stress related pain in the head, neck and abdomen, diagnosed according to strict defined criteria (2), and compared to 23 matched controls. Also, higher resting muscle activity was shown. We will also present data showing increased cortisol (3) and decreased oxytocin, an imbalance between nociceptive omega-6 and antinociceptive omega-3 fatty acids (4) and increased risk for developing fibromyalgia (5) in children with psychosomatic pain.

**Conclusion.** Stressors potentiated the startle reaction with increased muscle activity in rest and increased excitability. These reactions and increased cortisol and decreased oxytocin in those children are in accordance with findings of the right dominance of stress in the bicameral brain (6). These neurophysiological facts can be of importance for the understanding of clinical manifestation of recurrent pain and must be heeded in the treatment of patients with pain related to stress.

Key notes: Recurrent pain; stress, psychosomatics, muscle; EMG; cortisol; oxytocin; bicameral brain;

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