

Altered fMRI resting-state connectivity in individuals with fibromyalgia on acute pain stimulation.

[Ichesco E¹](#), [Puiu T¹](#), [Hampson JP¹](#), [Kairys AE^{1,2}](#), [Clauw DJ¹](#), [Harte SE¹](#), [Peltier SJ³](#), [Harris RE¹](#), [Schmidt-Wilcke T^{1,4}](#).

Abstract

BACKGROUND:

Fibromyalgia is a chronic widespread pain condition, with patients commonly reporting other symptoms such as sleep difficulties, memory complaints and fatigue. The use of magnetic resonance imaging (MRI) in fibromyalgia has allowed for the detection of neural abnormalities, with alterations in brain activation elicited by experimental pain and alterations in resting state connectivity related to clinical pain.

METHODS:

In this study, we sought to monitor state changes in resting brain connectivity following experimental pressure pain in fibromyalgia patients and healthy controls. Twelve fibromyalgia patients and 15 healthy controls were studied by applying discrete pressure stimuli to the thumbnail bed during MRI. Resting-state functional MRI scanning was performed before and immediately following experimental pressure pain. We investigated changes in functional connectivity to the thalamus and the insular cortex.

RESULTS:

Acute pressure pain increased insula connectivity to the anterior cingulate and the hippocampus. Additionally, we observed increased thalamic connectivity to the precuneus/posterior cingulate cortex, a known part of the default mode network, in patients but not in controls. This connectivity was correlated with changes in clinical pain.

CONCLUSIONS:

These data reporting changes in resting-state brain activity following a noxious stimulus suggest that the acute painful stimuli may contribute to the alteration of the neural signature of chronic pain. WHAT DOES THIS STUDY/ADD?: In this study acute pain application shows an echo in functional connectivity and clinical pain changes in chronic pain.