

What if pain in fibromyalgia is primarily due to increased muscle tension?

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We have found, using a pressure gauge with a needle inserted into the trapezius muscle, that muscle pressure is almost three times higher in patients with the fibromyalgia syndrome (FMS) compared with rheumatic disease and normal controls¹. The trapezius muscle was chosen for convenience. In the future the quadriceps and other muscles will be evaluated. Rheumatic disease patients with conditions other than fibromyalgia were chosen because they tend to have some musculoskeletal pain but generally much less than fibromyalgia patients.

The muscles are painful in fibromyalgia, and tender points used to be a part of the criteria for the diagnosis. The American College of Rheumatology's current criteria², however, have not included tender points. The new criteria for fibromyalgia are entirely subjective, and despite the best exercise of professional judgement, leave room for interpretation.

The quantitative measurement of muscle pressure has a significant benefit in the diagnosis of FMS. It can be determined by a doctor or nurse in the office and recorded as numerical data. The differences observed in the muscle pressures of patients with and without fibromyalgia were found to be significant ($p < 0.001$).

Past muscle biopsies of fibromyalgia patients have shown evidence of hypoxia in skeletal muscle, but no inflammation^{3,4,5}. Is the hypoxia due to increased muscle tension with compression of the microvasculature?

Another observation that might relate to increased muscle pressure is the straight neck seen on lateral view radiographs of the cervical spine^{6,7}. When observing the neck x-ray of a patient with fibromyalgia, a loss of the usual lordotic curve without other radiographic abnormalities can typically be found. Instead of a reverse C, the neck looks straight, a potential effect of the high muscle pressure found in patients with FMS. A lateral view of the cervical spine may be a diagnostic aid in fibromyalgia and not require an evaluation of muscle pressure.

It will be interesting to evaluate noninvasive techniques for measuring muscle pressure, and currently elastography (shear wave ultrasound) and near infrared spectroscopy are two possible technologies to look for muscle firmness (shear wave ultrasound) and for hypoxia (infra-red spectroscopy, similar to pulse oximetry).

If fibromyalgia patients do have increased muscle pressure, as our research suggests, there is still a central component to the pain. We have evaluated anxiety and stress^{8,9}, both of which appear to make the muscle pain worse in fibromyalgia, according to patients surveyed. These patients could be neurologically 'wired' in a way that predisposes them to chronically tense their muscles.

Approaches to reduce the pain in fibromyalgia can include medications like muscle relaxants as well as other non-pharmacologic techniques such as meditation or other relaxation strategies^{10,11} to reduce muscle tension. High doses of cyclobenzaprine or tizanidine at night to avoid daytime sedation, in addition to amitriptyline and similar medications also at night to improve interrupted sleep, may be helpful. Explaining to patients that they may be unconsciously tightening their muscles can help them focus on muscle relaxation and try to divert their attention away from their significant pain throughout the day.

Further research needs to be done to understand the role of increased muscle pressure and its contribution to the pain in fibromyalgia. Using muscle pressure as a quantitative marker with the aid of a pressure gauge may help us to recognize increased muscle tension as an important mechanism.

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