Ultralaser treatment for fibromyalgia yields 75 percent pain reduction when applied to the hands

August 30 2018

Medical device developed at the Optics and Photonics Research Center applies laser and ultrasound simultaneously with analgesic and anti-inflammatory effects. Credit: FAPESP

A new device that combines low-intensity laser light and therapeutic ultrasound considerably reduces the pain experienced by patients with fibromyalgia. Fibromyalgia is a chronic disease that involves widespread

nonarticular high-intensity pain lasting longer than three months. It affects 3 percent to 10 percent of the adult population, with a higher prevalence in women. Although patients experience pain in practically the entire body, they do not present with injuries, inflammation or tissue degeneration. Its cause is unknown, and no cure has been found so far.

The standard treatment comprises physical exercise, anti-inflammatory and analgesic medication, and psychotherapy, as patients typically complain of extreme fatigue, difficulty concentrating, dizziness, depression and anxiety.

A scientific study now shows that application to the palms instead of to points on different parts of the body has better analgesic and anti-inflammatory effects. As a result of pain reduction, patients also sleep better and are able to perform daily tasks with less discomfort. Their overall quality of life also improves.

In an article published in the *Journal of Novel Physiotherapies*, researchers at the Optics and Photonics Research Center (CEPOF) describe the concomitant application of low-intensity laser light and therapeutic ultrasound for three minutes to the palms of patients diagnosed with fibromyalgia. The treatment consisted of 10 twice-weekly sessions.

"The study describes two innovations: the device and the treatment protocol. By emitting laser light and ultrasound simultaneously, we succeeded in normalizing the patient's pain threshold. Application to the palms differs from the focus on tender points found practically everywhere in fibromyalgia care," said Antônio Eduardo de Aquino Junior, a researcher at the University of São Paulo's São Carlos Physics Institute (IFSC-USP) in Brazil and a coauthor of the article. The principal investigator for the project was Vanderlei Salvador Bagnato, full professor and director of IFSC-USP.

In the study, 48 women aged 40 to 65 diagnosed with fibromyalgia were divided into six groups of eight at the Clinical Research Unit run by IFSC-USP. Three groups received applications of laser or ultrasound separately or combined in the region of the trapezius muscle. The other three groups received applications only to the palms. The results showed that application to the palms was more effective regardless of the technique, but the laser-ultrasound combination significantly improved the patients' condition. Assessments were performed using the Fibromyalgia Impact Questionnaire (FIQ) and the Visual Analogue Scale for Pain (VASP).

A comparison of the groups showed a difference of 57.72 percent in functionality improvement and of 63.31 percent in pain reduction for the ultrasound-laser group in the case of application to the trapezius. Ultrasound-laser application to the palms produced a 73.37 percent difference in pain reduction compared with application to the trapezius.

Tender points

The idea of testing the effects of the new device in application to the palms of the hands arose from a review of the scientific literature.

"Previous studies showed that patients with fibromyalgia had larger numbers of neuroreceptors near blood vessels in the hands. Some patients even had red points in this region. We therefore changed focus to test the direct action of the technique on these sensory cells in the hands rather than just so-called pain trigger points, such as the trapezius, which is typically very painful in fibromyalgia patients," said Juliana da Silva Amaral Bruno, a physical therapist and first author of the study.

The study showed that application to the hands affects all pain points in the patient's body. The same group had previously published an article in the *Journal of Novel Physiotherapies* describing a case study of the

device applied to pain points. Although the results of this first study were satisfactory, global pain reduction proved impossible.

"Combined application of ultrasound and laser to pain points such as the trapezius was highly effective, but did not succeed in reaching the other main innervations affected by the disorder," Bruno said. "Application to the palms of the hands had a global result, restoring the patient's quality of life and eliminating pain."

According to the study, the optimization of peripheral and brain blood flow via the activation of sensitive areas of the hands during the sessions normalized the patient's pain threshold. "It's important to bear in mind that this isn't a cure, but a form of treatment that doesn't require the use of drugs," Aquino said.

According to Aquino, the new device that combines ultrasound and laser therapy should come to market in early 2019. It is currently being tested for other pathologies by researchers at the FAPESP RIDC.

"We're testing it for osteoarthritis, knees, hands and feet, and the results have been interesting. Other projects are being designed for other diseases," Aquino said.

More information: Juliana Silva Amaral Bruno et al. Could Hands be a New Treatment to Fibromyalgia? A Pilot Study, *Journal of Novel Physiotherapies* (2018). DOI: 10.4172/2165-7025.1000393

Provided by FAPESP