Fibromyalgia Syndrome (FS) currently affects 2–5% of the adult population (=5 million Americans). Fibromyalgia Syndrome (Fibromyalgia Syndrome) affects up to 6% of the juvenile population, with a typical onset around 12 years old. Physically active high school or collegiate students, including athletes, could be diagnosed with FS. Patients often experience widespread pain, which changes from day to day. Compared to healthy age-matched individuals, FS patients typically have diminished strength, upper body flexibility, balance, coordination, and endurance, which could be manifested by decreased athletic performance. Pain is thought to relate to neural stimulation that causes constriction of blood vessels and an overall decrease in blood flow.

Treatment for FS includes pharmacological interventions, cognitive behavior therapy, exercise, myofascial release, and various therapeutic modalities to decrease pain and improve function. Medications offer only a 50% relief of symptoms, however, and up to 47% of FS patients are noncompliant in taking prescribed medication.

Low-Level Laser Therapy (LLLT), administered by cold lasers (class 3b), offers a non-pharmacological means of decreasing pain. This modality is believed to stimulate energy production, mediate cell membrane permeability, dilate blood vessels, and decrease pain. Decreased pain and improved function in FS patients treated with LLLT has been documented.

Case Report

A 19-year-old, female Hispanic college student diagnosed with FS was referred to a rehabilitation clinic for treatment. She reported widespread general pain and fatigue that had developed over a period of 3 months. She reported having met with a counselor for management of depression and a decreased ability to complete academic assignments. During the initial evaluation, 14 of 18 hyper-sensitive areas as defined by the American College of Rheumatology Fibromyalgia sensitivity chart were identified (Figure 1). The patient had an initial Fibromyalgia Impact Questionnaire (FIQ) score of 82 and a Subjective Activity of Daily Living (SADL) subscale score of 20. The FIQ is a questionnaire that is used to determine the impact of fibromyalgia on the patient’s daily life and to monitor treatment outcome. The FIQ consists of 10 questions that relate to...
the patient’s physical impairment, feeling good, ability to do work, pain, fatigue, feeling rested, stiffness, anxiety, and depression. A 0-100 composite score is calculated, with a lower scores representing a lesser adverse impact of FS on the patient’s status. The average FS patient scores around 50 and severely affected patients score approximately 70. The SADL subscale of the FIQ is derived from ratings of the ability to perform daily activities, including ability to shop, do laundry, prepare meals, or visit friends (0 = always to 3 = never).

Treatment was limited to administration of LLLT twice per week for 2 weeks. The patient did not participate in an exercise program and there was no change in medications during the treatment period. At the beginning of each treatment session, the patient identified areas of sensitivity and rated the pain level (0–10) associated with each sensitivity point before and after administration of LLLT. The clinician used an MR4 device (Multi Radiance Medical, Solon, OH), with the super-pulsed laser shower transducer that incorporates six 50W laser diodes (905 nm) and four 25W infrared diodes (660nm). All treatments were administered with utilization of a sweep protocol (5-1000 Hz) for a 2-minute duration over each of the identified sensitivity points. The patient completed the FIQ weekly to document the effect of LLLT.

After four treatments (2 weeks), the total number of sensitive points decreased from 14 to 6. A 0–10 visual analog pain scale documented a four-point reduction from 6/10 to 2/10. The FIQ score decreased from 82 to 23 (Figure 2) and the SADL score decreased from 20 to 5 (Figure 3). The patient was subsequently unable to attend therapy sessions for 2 weeks. The number

Figure 1 Fibromyalgia sensitivity chart.

Figure 2 Fibromyalgia Impact Questionnaire (FIQ) weekly scores. Maximum possible score is 100. A lower score indicates better function.
of sensitive points returned to 14 and the FIQ score increased from 23 to 54, but the SADL score decreased to 0. Despite an increase in symptoms, the patient felt that her activities of daily living were not adversely impacted. These results suggest that LLLT is a viable nonpharmacological treatment for reduction of pain and increased function in FS patients.

**Discussion**

This case study documented benefits realized from the use of LLLT to treat a patient with FS. The treatments produced an immediate decrease in pain at the identified sensitive sites and the patient’s self-reported function increased; however, an increase in FIQ score at 2 weeks after administration of the last laser treatment suggests that the effects are transitory and may need to be administered on a regular basis to maintain the effect. Improvement in the SADL score after 2 weeks without treatment was remarkable, considering an apparent increase in pain, fatigue, stiffness, anxiety, and depression during the same period.

There is relatively little research evidence available to support the use of LLLT for FS. Gur et al.\(^\text{10}\) reported a decrease in the number of sensitive points from 13 to 7 and Williams et al.\(^\text{11}\) reported a decrease in FIQ score from pre- to posttreatment (63 to 56). Gur et al.\(^\text{10}\) treated each identified sensitive point for 3 minutes each day for a 2-week period (10 treatments). We saw a similar decrease in number of sensitive points after 4 treatments delivered over a 2-week period, and we treated each tender point for only 2 minutes. We used a 6-diode Ga-As laser with 50 W power output and a treatment area of 30 cm\(^2\). Gur et al.\(^\text{10}\) used a single-diode Ga-As laser with 20 W maximum output. Our patient reported a 59-point decrease in FIQ score, whereas Williams et al.\(^\text{11}\) reported a 7-point decrease after eight treatments administered over a 4-week period. We treated each sensitive point, but Williams et al.\(^\text{11}\) treated eight standard points, whether a given point was sensitive or not. Their participants may have had sensitive points that were not treated. Furthermore, they used a Class IV laser with a maximum power output of only 12 W.

**Summary**

Our results suggest that LLLT should be administered to each tender point, which may increase the total amount of energy absorbed by the tissues. Future research should utilize the LLLT protocol used in this case to assess its effectiveness for other FS patients.

**References**


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