



Emerging Non-Pharmacological Refractory Intervention for Pain Relief in Fibromyalgia: A Case Report

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Abstract

Fibromyalgia (FM) is a common disorder characterised by widespread musculoskeletal pain often associated with fatigue, sleep, memory and mood disturbances. Females are more likely to suffer from FM and experience a reduced quality of life. This is a case report of a 21-year-old female patient diagnosed with FM whose pain was managed by a non-pharmacological method, weightlifting exercises. The patient suffered from chronic generalised muscular pain, muscle stiffness, fatigue, depression and anxiety. She was started on a tight progressive weight-lifting program to increase muscle mass. The program led to a resolution of symptoms after 3 months of gradual improvement, in addition to stopping taking analgesics for the pain. Notably, a relapse occurred after halting the exercise program suggesting that the weight-lifting regime was correlated to reducing symptom severity and better quality of life. Exercises involving weight-lifting could potentially provide an affordable treatment option for patients with FM.

Key words: Fibromyalgia; Pain; Pain relief; Non-pharmacological.

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Introduction

Fibromyalgia (FM) is a disorder characterised by widespread musculoskeletal pain often accompanied by fatigue, sleep, memory and mood disturbances. It is a very common cause of chronic musculoskeletal pain and its prevalence in the United States is estimated to be around 2-8 %.¹ Its incidence is five times greater in women than men.² FM is a challenging disease to diagnose due to the non-specific nature of symptoms which are associated with the predominant symptom of chronic pain. Despite it being non-life threatening and non-progressive, chronic pain due to FM has a significant impact on patients' quality of life.^{1,3}

The aetiology of FM is unknown but it is theorised that a disruption of neuroendocrine transmitters is at play.² Somatic and psychological symptoms

may range from mild to severe and include sudden generalised musculoskeletal pain, muscle stiffness, especially in the morning, fatigue, gastrointestinal (GI) upset and mood and sleep disorders.^{2,3} There is no gold standard for treatment. Treatment options include symptomatic relief and pharmacological interventions. Specifically, several meta-analyses and clinical trials have concluded that pharmacological intervention (such as the three FDA-approved medications: Duloxetine, Milnacipran and Pregabalin) alleviates FM pain.⁴ However, it is a complex condition that necessitates multiple treatment modalities and no single therapy outperforms the others in terms of efficacy.

Weight lifting exercises involves lifting weights

or exercising with body weight to provide resistance to movement and result in building muscles. When considering weight lifting exercises in treating FM, results found that it significantly improved overall well-being and wellness.⁵ In addition, having fatigue as a major symptom in women with FM, exercise dramatically decreased feeling of fatigue in many patients.⁶ So, when comparing to no exercise, weight lifting exercises succeeded in reducing pain, tenderness and depression.⁷

The primary goal of this case study is to provide insights and substantiate the evidence on how patients with FM can manage their pain through strength training, which includes resistance exercises and weight lifting.

Case History

A 21-year-old female patient of Arab ethnicity, a student, presented to the Internal Medicine Out-patient Clinic at Princess Basma Teaching Hospital due to generalised muscular pain that lasted for several months' and was increasing progressively in an unpredictable pattern. Patient reported that her pain was aggravated by walking or standing for prolonged periods of time and had no clear alleviating factors. The patient reported muscle stiffness and foot pain that required more than 30 minutes to resolve spontaneously. Stiffness and pain were suspected to be caused by the patient's abnormal posture, as a result, suspicion of anterior pelvis tilt or lordosis was high. Then, anterior pelvis tilt and lordosis were ruled out by imaging studies and after exclusion of other secondary causes, pelvic muscle weakness found to be the culprit. In addition to the constant fatigue that was not relieved by rest, patient also reported anxiety and depression as major complaints which yielded her to a psychologist. The symptoms negatively impacted the patient's quality of life and social and academic performance. Patient's medications included Amitriptyline (*Tryptizol*) - tricyclic antidepressant, 10 mg twice daily and Paracetamol with Orphenadrine citrate (*Muscerol extra*) 2 pills twice daily. Patient otherwise had no previous significant medical or surgical history. Family history was unremarkable. Patient's body mass index (BMI) was 18.7. Thyroid stimulating hormone level was within normal range 2.49 uIU/mL and liver function tests were normal. Rheumatological panel was

negative. After ruling out any secondary cause, FM was considered and exercise treatment was directly initiated.

Treatment protocol and results

The patient's exercise program was based on a progressive overload on muscles to induce hypertrophy. This was accomplished through gradual increases (minimum 2.5 kg - 3.5 kg) in weights lifted or increases in repetitions (reps) and sets. Reps were the actions of one complete exercise and sets were the number of reps performed in a row between rest periods. The first month's program consisted of a full-body routine of six exercises: push ups, squats, chin ups, military press, burpees and lunges, performed five days per week. Each exercise was performed in three sets of 20-25 reps with 20-25 seconds rest between each rep. For the second month, the patient increased the intensity of her routine by increasing the weights used in her exercises and completed three sets of 15-20 reps with 30-35 seconds of rest between reps. She continued to do a full body workout routine involving six exercises for five days per week. The subsequent months, the intensity was increased by either increasing weights or the number of sets and reps.

A specialised nutritionist prescribed a strict diet of 1900 calories to meet her basal metabolic rate to maintain BMI within normal range according to age and height thus maximise muscular hypertrophy. An improvement in her BMI (Table 1) and strength was noticed as well as a decrease in her symptoms. The alleviation of symptoms highly motivated patient adherence for 8 months on the program. Patient noticed a reduction in muscle stiffness, leg pain, fatigue, depression and anxiety from the first week and by the end of the first month her symptoms completely resolved. Her medications were slowly tapered after the first month and by the third month she was no longer taking any medications and still reported no symptoms. Due to personal circumstances, the patient could not train for one week and soon began to experience muscle pain and stiffness. She then restarted her program and three months later reported major improvements, she regained her energy and vigour which had been absent for several years. Patient continued to be mostly adherent to her exercise program. In the rare occasion when she missed training, she noted relapses of symptoms. She became self-sufficient in her training program and learned how to keep

Table 1: Improvement in the patient's body and muscle mass, body fat, BMI and BMR after treatment

Comparison between the parameters before and after the exercise program		
Scales	Before initiating the exercise program (At the time of diagnosis)	After 6 months
Body mass	49.6 kg	56 kg
Muscle mass	63.1 %	67.5 %
Body fat	22.8 %	26.5 %
BMI	18	21
BMR	1176	1241

BMI: Body mass index, BMR: Basal metabolic rate

her muscles in a progressive overload to induce muscle growth. She reported that her quality of life dramatically improved and no limitations in her social and academic performance.

Discussion

Pain is the primary symptom of FM and it is theorised that FM is neurogenic in origin because it is associated with a central amplification of pain perception.⁴ However, the exact aetiology remains unknown. A disruption of neuroendocrine transmitters, such as serotonin, growth hormone and cortisol, appears to be implicated.² There is no gold standard for treatment of FM but it remains challenging and both pharmacological and non-pharmacological options should be considered.⁴ Three FDA-approved medications, duloxetine, milnacipran and pregabalin, have been found to be effective in reducing FM pain by several meta-analyses and clinical trials.⁴ The majority of patients take medications from a variety of classes which leads to significant financial burden for the patient. Medical consultation and medication costs are estimated to cost 951 USD over a three-month period.⁸ The exercise program followed by this patient presents a more affordable, yet still effective treatment option. The costs involved only include a gym membership or weightlifting equipment.

It may seem counter-intuitive to purposely stress muscle in patients who have muscle pain. However, a growing body of evidence challenges the assumption that resistance (strength) training worsens muscle pain in people with FM. In fact, the latest evidence indicates that when resistance

training is tailored to individual needs, people with FM can obtain worthwhile improvements in FM severity.⁹ Several studies empirically suggested that strength training can significantly improve the quality of life for people with FM.^{5-7,10}

The therapeutic protocol is based on ensuring muscular hypertrophy by weightlifting exercises tailored to patient's needs and abilities. The core of this approach is the abnormal baseline of neuroendocrine hormones which can be improved with consistent exercises.² A strict diet is also necessary to guarantee maximum muscular hypertrophy. The recurrence of the patient's symptoms with program interruption emphasises the link between exercise and FM pain management and shows that the program may induce remission but it does not result in a permanent cure.

Conclusion

This report shows a significant improvement in FM symptoms: complete remission of muscle pain, stiffness, fatigue, depression and anxiety. Furthermore, the report introduces a new method of treating functional limitations experienced by patients for minimal cost, namely a gym membership or weight lifting equipment at home. The weight-lifting program was extremely effective in reducing the patient's symptoms, therefore pharmacological interventions were not needed. However, a pilot study is needed to test this approach on a larger number of patients with FM to evaluate its potential for inclusion in management guidelines.

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Conflict of interest

None.

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