Exercise in fibromyalgia

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Purpose of review

Several studies have indicated that physical exercise is beneficial for patients with fibromyalgia. The aim of this article is to review the recent literature relating to exercise in fibromyalgia, specifically articles published between September 2003 and September 2004, to highlight developments in the field.

Recent findings

Previous studies indicate that aerobic exercise performed at adequate intensity for an individual can improve function, symptoms, and well-being. A recent study of aerobic exercise showed that training in sedentary women with fibromyalgia using short bouts of exercise produces improvements in health outcomes. A study of aerobic walking resulted in improvements in physical function, symptoms, and distress. Two studies of low-intensity pool exercise reported a positive impact on fibromyalgia symptoms and distress. Two studies of qigong movement therapy were reported, one indicating improvements in symptoms and the other in movement harmony, indicating that this mode of exercise needs to be evaluated further.

Summary

The recent studies support existing literature on the benefits of exercise for patients with fibromyalgia. The outcomes appear to be related to the program design and the characteristics of the populations studied. As the patients with fibromyalgia form a heterogeneous population, more research is required to identify the characteristics of patients who benefit from specific modes of exercise. Moreover, long-term planning is needed to motivate the patients to continue regular exercise. Informing patients about the benefits of exercise and adjusting the exercise intensity to individual limitations enhances adherence. The social support gained by exercising in groups also enhances adherence to exercise.

Keywords

aerobic, exercise, fibromyalgia, pain, physical

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Abbreviation

RCT randomized controlled trial

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Introduction

Fibromyalgia is characterized by long-lasting, widespread pain and generalized tenderness, often accompanied by fatigue [1]. The prevalence of fibromyalgia ranges from 1–3% in the general population [2], and the condition is more common among females than males. Aberrant physiologic pain-processing mechanisms, together with multiple psychological and environmental factors, are thought to interact in the development and maintenance of fibromyalgia.

Many individuals with fibromyalgia report limitations in daily activities such as carrying objects, walking, and working with their arms. Patients with fibromyalgia demonstrate reduced physical performance capacity of the upper and lower extremities [3,4] and aerobic capacity at levels similar to [3,5] or below [6] that of sedentary women. Perceived disability can affect every dimension of life, including social roles, employment, and leisure time, which in turn can impact one's perception of the self and one's abilities and disabilities. The severity and consequences of fibromyalgia are associated with pain, fatigue, helplessness, psychological distress, coping, and level of education [7].

Several recent reviews indicate that physical exercise is beneficial for patients with fibromyalgia [8•,9], and two recent surveys conducted in the United Kingdom [10] and Ireland [11] indicate that exercise is now an integral part of physical therapy in fibromyalgia.

This review updates our present knowledge of the role of physical exercise in the rehabilitation of patients with fibromyalgia by summarizing the literature from September 2003 to September 2004. The randomized controlled trials (RCTs) included in this review are divided according to the main component of the treatment program into (1) aerobic exercise by means of cycling, dance, or whole-body exercise, (2) walking, (3) pool exercise, (4) strength training, and (5) qigong.

Aerobic exercise by means of cycling, dance, or whole-body exercise

Several studies of moderate-intensity to high-intensity aerobic exercise by means of cycling, dance, or whole-body

exercise for patients with fibromyalgia have been published since 1988. McCain *et al.* [12], who studied the effects of moderate-intensity to high-intensity ergometer cycling, found improvements in aerobic capacity, tender point pain threshold, and global well-being in the group that exercised three times a week for 20 weeks. Improvements in aerobic capacity [13,14] and pain threshold [14,15] have since been reported in other studies. A meta-analysis of four studies examining the efficacy of physical exercise [16] found a 17% improvement in aerobic performance, a 28% improvement in tender point pain threshold, and an 11% reduction in pain rating in the exercise programs performed at 55–90% of predicted maximum heart rate at least twice a week for a minimum of 20 min.

Not all studies of aerobic exercise have reported improvements in aerobic capacity, however [17–19]. The reasons for the inconsistency in results may be differences in the training programs or the patients' baseline physical capacity. For example, a study aiming to evaluate the effects of high-intensity aerobic exercise found that patients were not able to manage high-intensity exercise [19]. Only a few studies include formal testing of patients' baseline function and use baseline function as a criterion for inclusion [12,20]. From a clinical point of view, exercise in fibromyalgia appears to produce the best benefits when the program is individually tailored to the patient's baseline function, symptom severity, and tolerance of exercise-induced pain.

A recent study indicates that aerobic exercise divided into short bouts in sedentary women with fibromyalgia can produce positive results [20]. The effects of short compared with long bouts of aerobic exercise were compared in a study that recruited 143 sedentary women with fibromyalgia [20]. Participants performing the long bouts of exercise were instructed to gradually increase their exercise session to 30 min, while those exercising in short bouts were instructed to exercise for two sessions a day for a total of 30 min. All major muscle groups of the lower extremities were used in the rhythmic dynamic exercise program that was performed at home and guided by means of videotapes. The intensity started with 40–50% of the heart rate reserve and progressed to 65–75% by week 12, and was then held constant to week 16. Both exercise groups improved in terms of self-efficacy and disease severity compared with the control group. No differences were found between the two exercise groups, however [20].

Walking

Walking can be performed at varying intensities, and therefore, walking may be an alternative exercise option for patients with fibromyalgia who are unable to participate in aerobic exercise programs of higher intensities. Exercise programs consisting primarily of walking have shown improvements in physical function [21], self-efficacy [21,22], tender point status [21,23], well-being [23], and quality of life [22]. Several of these improvements persisted up to 7–11 months [22] or 1 year [21,23].

A recently published study reported positive effects of walking [24••]. Seventy-six sedentary women were recruited to compare the effects of supervised walking and stretching three times per week for 45 min over a 20-week period. Exercise intensity in the walking group was individually tailored to the patient's baseline physical function. Sixty-six percent of the patients in the walking group and 33% of those in the stretching group gained at least 15% improvement of their oxygen uptake. The between-group analysis showed that the walking group improved in terms of maximum oxygen uptake, vital capacity, the Fibromyalgia Impact Questionnaire (FIQ) total score, depression, and mental health compared with the control group who had practiced stretching [24••].

Pool exercise

Pool exercise is a common therapeutic modality for patients with rheumatic diseases, especially in Scandinavian countries. Temperate pool water reduces stiffness and alleviates pain, while the viscosity of water provides the resistance required in aerobic and strengthening exercises.

Previous studies of pool exercise programs have varied in length, ranging from 6 weeks [25] to 6 months [26], and intensity has ranged from low [26] to moderate-to-high [27]. Two of the pool programs evaluated were combined with an educational program [25,26]. Significant improvements in aerobic performance capacity were found as measured by the 6-min walk test [25,26,28] and the bicycle ergometer test [27]. Improvements were also seen in fibromyalgia symptoms and distress [25,26,28]. Follow-ups ranging from 12 weeks to 6 months demonstrated lasting benefits in aerobic performance capacity [25–27] and symptoms [25,26]. A long-term follow-up found that improvements in physical performance, pain, and fatigue lasted for more than 2 years [29], probably because the patients had continued to exercise after completing the trial.

Two recent studies of pool exercise report improvements in symptom severity and distress. These exercise programs were described as low-intensity exercise programs. Cedraschi *et al.* [30••] allocated 164 patients with fibromyalgia to either a 6-week program of pool exercise and education or to a waiting list control group. The intervention program consisted of 12 sessions of swimming and relaxation exercises performed twice a week for 6 weeks. Each session comprised 45 min exercise and 45 min education. After 6 months, the patients in the exercise group showed improvements in fibromyalgia symptoms and

consequences (the total score on the FIQ) and distress compared with the control group. This study also demonstrated that the patients were satisfied with the treatment program. Altan *et al*. [31•] randomly allocated 50 patients with fibromyalgia to a 12-week pool exercise program or balneotherapy. The treatment programs were conducted three times a week for 12 weeks, and each session lasted for 35 min. The exercise group performed aerobic, flexibility, and stretching exercises and relaxation, while the balneotherapy group did not exercise. The between-group analysis showed that the exercise group had significantly improved in terms of depression compared with the balneotherapy group. Significant within-group improvements were found in both treatment groups for several symptoms, including scores for the severity of pain, fatigue, and stiffness.

Strength training

Two previous studies have independently evaluated the effects of strength training, finding positive results in improved muscle strength [32,33]. Both programs started at a low exercise load and progressed toward higher loads. No new studies of strength training in fibromyalgia have been published during the last year.

Qigong movement therapy

Two recent studies have evaluated the effects of qigong, an ancient movement therapy developed in China. Slow qigong movements are performed either in a standing position or while changing position. They are aimed to improve not aerobic capacity but the quality of movement, concentration, and peacefulness.

One hundred twenty-eight patients with fibromyalgia with ages ranging from 18 to 60 years and an average duration of fibromyalgia symptoms of 5 years were enrolled in a study designed to evaluate the effects of an 8-week program of qigong focusing on posture, breathing, and concentration, and mindfulness meditation focusing on mental awareness. Patients were allocated to either the intervention program or an education support program. The weekly lectures lasted for 2.5 hr in both programs [34••]. Significant within-group improvements were found for fibromyalgia symptoms and depression both in the qigong and education groups. No between-group differences were found, however, indicating that qigong combined with meditation was not superior to the educational program.

Another recent study investigated the effects of a 3-month program of qigong and body awareness therapy [35•]. Thirty-six patients with fibromyalgia with the mean age of 45 years and a mean symptom duration of 10 years were recruited to the study and randomized either to an intervention group or to an untreated control group. The weekly lectures were 1.5 hr long, and the program comprised a total of 14 sessions including various body awareness movements focusing on breathing and posture and qigong movements focusing on relaxation, grounding, and concentration. Significant improvements were found in movement harmony in the treatment group compared with the control group, while no improvement was found for the symptoms. Further research is needed to determine which patients with fibromyalgia can obtain benefits from qigong and other movement therapies focusing on the enhancement of mental awareness and movement harmony.

Exercise combined with education

Patient education in rheumatology aims to enhance the individual's ability to manage disease and the difficulties encountered in daily life by learning more about the body, the disease, and the individual's own responsibility for treatment and healthy behavior. Education or collaborative reasoning designed to enhance the patient's understanding and management of the disease or disorder commonly occurs simultaneously with clinical treatments or during standardized educational programs.

One recent study [30••] and a few previous studies [22,25,26] have combined exercise with an educational self-management program, finding improvements in self-efficacy [22,25] and symptom severity [22,25,26,30••]. It is likely that the improvements in self-efficacy and symptom severity were probably obtained by the combination of education and exercise. Two of these studies explicitly describe using the exercise program as a mode of education to teach the participants to handle their symptoms during exercise [26,30••].

A recently published qualitative study found that patients who are well informed about the risks and benefits of exercise are more likely to adhere to an exercise regimen [36•]. Another qualitative study showed that education and exercise in a group provides an opportunity for social interactions during which the patients learn how to manage their symptoms and disabilities better [37•].

Exercise and symptoms

Previous studies yield inconsistent results about the effects of exercise on pain and other symptoms. Some studies report improvements in tender point status. Other studies found improvements in variables reflecting perception of overall health status and distress. Still other studies did not find improvements in these variables [8•]. Four of the six recent studies indicate some improvements in symptoms and distress [20,30••,31•,34••]. These improvements were found in a walking exercise program [20], pool exercise combined with education [30••], pool exercise alone [31•], and qigong movement therapy [34••]. Between-group differences were not found in the two studies comparing one treatment with another

treatment, however [31•,34••], indicating that balneotherapy [31•] and education [34••] also had a positive impact on fibromyalgia symptoms. It appears that the majority of patients with fibromyalgia can take part in low-intensity exercise or in exercise performed at self-selected intensities by adjusting the load and pausing during the program, while only a minority exercise at higher intensity levels [8•,19]. Also, a recent study conducted at our clinic showed that most patients engage in low-intensity physical activity or exercise during their leisure time, such as walking and cycling [38], while only a few patients exercise at a high intensity level. The total amount of exercise was fairly high, however, around 5 hr/week.

The aerobic exercise programs evaluated during the past year either were of low intensity/impact [20,30••,31•] or the exercise intensity level was adjusted to match the patients' baseline functional level [24••]. From a clinical point of view, this approach works best. A need also exists for studies evaluating the effects of exercise at higher intensities in patients who are able to engage in high-intensity exercise, however, as previous studies have found improvements in aerobic capacity and the tender point status after exercise of moderate to high intensity [16].

Long-term adherence

Motivating patients to continue regular exercise after completing a supervised program is crucial to maintain long-term gains. Adherence to exercise has been found to improve if the patients are informed about the risks and benefits of exercise [36•] and if they are taught how to adjust the exercise match their individual limitations [29]. Moreover, an exercise program that conveys positive experiences of the body may be important for patients who commonly perceive their body negatively in terms of pain, fatigue, and disabilities [37•].

Conclusion

Aerobic exercise performed at adequate intensity for an individual patient can improve function, symptoms, and well-being. The results of a recent study suggest that a walking program performed at adequate intensity may produce similar results in sedentary patients. Another recent study indicates that an exercise program for sedentary women with fibromyalgia can be divided into short bouts and produce positive results. Two studies of pool exercise of low intensity demonstrated positive effects on fibromyalgia symptoms and distress. One study of qigong and meditation indicated positive effects on symptoms, while another study of qigong and body awareness therapy indicated benefits in terms of movement harmony, implying that movement therapies need to be evaluated further in fibromyalgia. The benefits of the exercise programs appear to be related to the design of the program and the characteristics of the population studied. As patients with fibromyalgia form a heterogeneous population, more research is needed on what characterizes the subgroups that benefit from a specific mode of exercise.

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