Which exercise can affect the pain characteristics of fibromyalgia patients?

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Objectives

In fibromyalgia, is often recommended exercise in combination/or not, with medication treatment, in order to improve patients' physical condition and quality of life (Kim, 2019; Macfarlane 2017).

Investigation of the possible influence and change of the pain characteristics of these patients, if we add to the exercise program that they follow, breathing exercises.

Methods and Tools

This is a double-blind randomized trial. The sample consisted of outpatients suffering from fibromyalgia, while the referral orthopaedic had suggested physiotherapy. The total number of patients who were given information was 112 from whom: 6 patients were excluded (4 for not meeting the eligibility criteria and 2 for refusing to participate). We used equal randomization such as 1:1 for the two groups based on order of entry to the study. An independent research assistant made the allocation. The same physiotherapist implemented therapeutic interventions. An independent physiotherapist, blinded to the study, recorded all data from patients' examinations. Patients' recruitment took place through the 401 General Military Hospital of Athens. Assessment of pain characteristics in patients was made through the completion of three questionnaires, once at baseline and once again after a three weeks period of exercise.

FIRST (Fibromyalgia Rapid Screening Tool) is a self-completed questionnaire for the detection of fibromyalgia syndrome in patients with diffuse chronic pain. Acut-off score of 5 (corresponding to the number of positive items) gave the highest rate of correct identification of patients (Perrot,2010; Arnold,2007; Zis,2017)

BPI (Brain Pain Inventory) is a self-report measure that has, over time, become a standard for the assessment of pain and its impact. The interference items were now presented with 0–10 scales, with 0 =no interference and 10=interferes completely.

A recent consensus panel recommended that the two domains measured by the BPI—pain intensity (severity) and the impact of pain on functioning (interference)—be included as outcomes in all chronic-pain clinical trials (Turk,2003; Mystakidou,2001).

PQAS (Pain Quality Assessment Scale) global score ranging from 0 to 10. Computation of a "global" PQAS scale score is not recommended, as this score would likely qualities. To understand the pain qualities experienced by the patients, we can rate each item individually. Item 20 on temporal pain is scored categorically (there are three options, or three types of temporal patterns that respondents can indicate) and is for descriptive purposes. Each sub- scale (Paroxysmal, Surface and Deep) score is the arithmetic mean of the items associated with each sub- scale. Sub-scale scores should only be computed for respondents who have provided a response to all of the items associated with the scale in question (Jensen,2006).

All questionnaires were translated and validated in the Greek Population (Zis,2017; Mystakidou,2001) except PQAS which the present study served as a mean for translation in Greek language.

Therapeutic Intervention

Both groups followed the same 10-minute warm-up program of active mobilization, large joints stretching (shoulders, elbows, wrists, hips, knees, ankles and spine) with each stretch lasting on average for 30 seconds(ACSM,2013;Guissard,2006;Kim,2019).

The first group of patients implemented a program of active exercises up to the limits of pain lasting 30 minutes with repetition 2 times a week for deltoids, quadriceps, trunk extensions, hip extensions, elbow flexors and gastrocnemius (Matsutani,2012; Richards,2002). For each muscle, the patient did a set of 10 repetitions (Kim,2019). Patients of the second group followed exactly the same programme with the addition of diaphragmatic breaths, when they reached the pain limit.

Patients of the second group followed exactly the same programme with the addition of diaphragmatic breaths, when they reached the pain limit. The patient performed the first exercise, discovering what the limit of the trajectory is, the point when the movement becomes painful (Blickenstaff,2015). At this point, he was instructed to repeat three breaths and then start the program described in the first group.

Statistical analysis and Results

Independent t and chi-squared tests results revealed that there are great similarities between the two groups before the implementation of the exercise program, so they are comparable.

Table 1: Demographic data and Pain characteristics of the subjects[a] (n=106)

Age	46.83 ± 5.991	(35 -57)
Sex [b] (male/female)	48 (45.3) / 58 (54.7)	
Areas feeling Pain [b] (Axial region/back/back & leg/shoulder)	17 (16) / 71 (67) / 6 (5.7) /12 (11.3)	
treatment or medication [b] (yes/no)	58 (54.7) / 48 (45.3)	
FiRST total score [b] (< 5 / ≥ 5)	43 (40.6) / 63 (59.4)	
BPI Pain Severity Score	6.09 ± 0.769	(4.5 - 7.75)
BPI Pain Interference Score	8.06 ± 0.812	(6 - 10)
PQAS Paroxysmal pain	6.08 ± 0.491	(4.6 - 7.2)
PQAS Surface pain	6.30 ± 0.582	(4.8 - 7.4)
PQAS Deep pain	5.71 ± 0.507	(4 - 7.2)
PQAS (deep / superficial) pain [b]	82 (77.4) / 24 (22.6)	
PQAS different time qualities of Pain [b] (intermittent/stable/variable)	11 (10.4) / 70 (66) / 25 (23.6)	

[a] Values are expressed as mean ± SD (range)

[b] Values are expressed as number of patients (%)

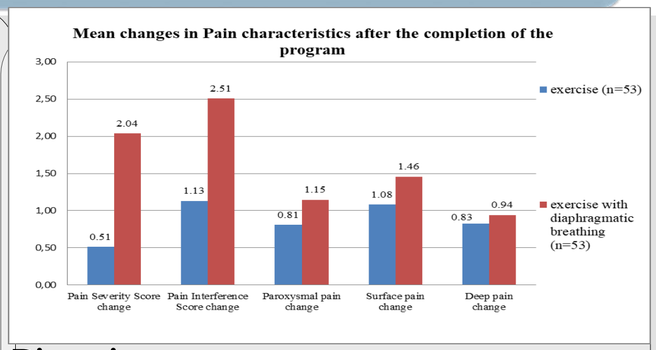
Table 2: Pain characteristics between groups after the completion of the program (3 weeks)

	exercise (n=53)	*exercise with diaphragmatic breathing (n=53)*	*P-value*
treatment or medication [b] (yes/no)	17 (32.1) / 36 (67.9)	6 (11.3) / 47 (88.7)	0.01
BPI Pain Severity Score	5.48 ± 0.818	4.14 ± 0.681	≤ 0.01
BPI Pain Interference Score	6.85 ± 0.822	5.62 ± 0.661	≤ 0.01
PQAS Paroxysmal pain	5.27 ± 0.422	4.93 ± 0.415	≤ 0.01
PQAS Surface pain	5.23 ± 0.399	4.83 ± 0.391	≤ 0.01
PQAS Deep pain	4.88 ± 0.507	4.77 ± 0.587	0.275
PQAS (deep/superficial) pain [b]	38 (71.7) / 15 (28.3)	34 (64.2) / 19 (35.8)	0.405
PQAS different time qualities of Pain [b] (intermittent/stable/variable)	16 (30.2)/25 (47.2)/12 (22.6)	16 (9.4)/26 (49.1)/11 (20.8)	0.969

[a] Values are expressed as mean ± SD

[b] Values are expressed as number of patients (%)

p<0.05 indicates statistically significant difference



Discussion

1)Low levels of flexibility have been associated with postural problems, pain, injuries, decreased local vascularisation, and increased neuromuscular tensions, which is the reason why the use of warm-up and stretches was necessary (Coehlo,2008; Kim,2019). Induction of this program more than twice per week is not recommended as has proven to lead to increased fatigue and discomfort (ACSM,2013; Kim,2019). 2)The purpose of this exercise is not only to increase fitness but also to provide a way of controlling allodynia and hyperalgesia that we are aware that exists in patients with fibromyalgia. Controlling the pain limit with breathing seems to have an effect because the sufferers from centralized pain such us fibromyalgia (Ablin,2017) learn through this technique that the point of pain is safe (Blickenstaff ,2016; Tabor,2017; Louw,2016). 3)Previous studies do not state clearly whether flexibility reduces pain and fatigue or not (Kim,2019). In our study, exercise appeared to have a beneficiary impact in both groups, since we found statistically significant differences in all scales, between baseline and after the completion, for each group.

Conclusions

Both groups demonstrate a significant improvement in all pain scale characteristics but the improvement of the 2nd group that practiced diaphragmatic breathing was much better.Analysis of the categorical variable BRI severity scale, showed that there was dependence between the intensity of pain and the type of exercise.