Efficacy of the "body movement and perception" method in the treatment of fibromyalgia syndrome: an open pilot study

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ABSTRACT

Objective. *Group exercises may be useful in fibromyalgia syndrome (FMS). The "Body Movement and Perception" (BMP) method is based on low impact exercises, awareness of body perception and relaxation, aimed at treating small groups of patients following the Resseguier method (RM) and integrating RM with exercises derived from soft gymnastics. We assessed the effects of BMP method on FMS.*

Methods. *40 women with FMS (age and disease duration: 51.7±7.2 and 4.9±3.8 years) participated in an open pilot study. BMP sessions were performed twice a week (50 minutes each) for 8 weeks. Patients were assessed at enrolment (T0) and at the end of the study (T1) by a self-administered questionnaire (temporal characteristics of pain, pain interference in working and recreational activities and in night-time rest, awareness of pain, fatigue, irritability, well-being, quality of movement, ability to focus on perception and to perceive whole body, postural self-control, ability to relax) and a clinical evaluation (tender points, assumption of analgesics/NSAIDs, distribution of pain, pain in sitting and standing position, pain during postural passages and gait, postural body alignment, muscular contractures).*

Results. *At T1, FMS patients significantly improved with respect to T0 in pain, fatigue, irritability, well-being, quality of movement, postural self-control, ability to relax mind and body, movement perception, tender point scores, assumption of analgesic/NSAIDs, body alignment and muscle contractures ($p<0.05$ for all the comparisons T1 versus T0).*

Conclusion. *In FMS patients, rehabilitation with BMP improves pain and well being, reduces the number of tender points and muscle contractures, thus it is useful in FMS management.*

Introduction

Fibromyalgia syndrome (FMS) is a condition characterised by chronic widespread pain for more than 3 months and bilateral sites of focal tenderness (tender points) (1), which may be accompanied by other symptoms such as sleep disturbance, fatigue, irritable bowel syndrome, headache, insomnia and depression.

In FMS, pharmacological therapy is often not sufficient in controlling symptoms or in improving functional impairment and health related quality of life (HRQoL), while non-pharmacological interventions play an important role and are increasingly recommended for patients management. The guide lines for FMS treatment of American Pain Society and German Interdisciplinary Association of Pain Therapy assigned the highest level of recommendation to aerobic exercise and cognitive-behavioural therapy (CBT) and European League Against Rheumatism (EULAR) recommendations also gave high level of recommendation to CBT, and also included heated pool treatment, individually tailored exercises (comprising aerobic exercise and strength training), although with a lower level of recommendation (2).

Although patients affected with FMS may show notable individual differences in the treatment outcome, non-pharmacological treatments seem to be more useful in patients with relatively high levels of psychological or emotional distress (3).

However, in FMS many studies assessing the efficacy of non-pharmacological interventions have suffered because of low volunteer rates (4), high number of drop-outs (5), and reduced compliance due to increased pain after exercising (6). For these reasons, the efficacy of exercise treatment in FMS may be improved by offering tailored treatments to patients at risk of developing

chronic physical and psychological impairments (7).

Some mind-body techniques, defined as "interventions that use a variety of techniques designed to facilitate the mind's capacity to affect bodily function and symptoms" (8) were of efficacy in treating FMS patients. Concentration based mind-body techniques, such as CBT, are beneficial in FMS (9, 10), while other techniques, both concentration based, such as Mindfulness Meditation (11), and movement based, such as body awareness techniques, Tai Chi and Qi Gong, have obtained encouraging, although non unequivocal, results (12-16). FMS patients should be preferentially treated with tailored treatment approaches, preferably with low impact exercises to respect pain threshold, in order to avoid side effects and to maintain a good compliance with the treatment (2, 17).

Recently, we demonstrated the efficacy on FMS patients of the Rességuier method (RM), a particular physiotherapy method (18, 19) somewhat resembling mind-body methods approaches (and potentially regarded as a mind-body technique itself) (8), as it is tailored to patient's needs and accessible also to patients suffering from severe forms of FMS with fatigue, asthenia and psychological distress. RM aims to obtain patient awareness and control of bodily perceptions, thus reaching a modulation of responses to pain. In RM, performed in individual sessions, the therapist controls patient attention and perception by verbal and manual contacts, leads the patient to perform bodily and respiratory exercises and bodily active and conscious movements, tailored to the patient. Our FMS patients treated with RM for 8 weeks showed improvement of pain, disability, HRQoL, movement quality, sleep, ability to relax and reduction in the assumption of analgesics and non-steroidal anti-inflammatory drugs (NSAIDs). After a 6-month follow-up, all the results, except an improvement in disability, were maintained (20).

The "Body Movement and Perception" (BMP) method is suitable for treating small groups of patients with RM, integrating its movements (18-20) with low impact exercises derived from soft gymnastics. BMP is based on low impact exercises, awareness of body perception, and relaxation. In preliminary studies, we showed the efficacy of BMP method on FMS patients symptoms (21, 22).

The aim of this pilot open study is to evaluate the effects of the BMP method in the treatment of FMS patients.

Patients and methods

Patients

Forty women affected with FMS (age: 51.7±7.2 years; disease duration: 4.9±3.8 years) were enrolled in an open study. Patients gave their written informed consent. Diagnosis of FMS was made according to the criteria of the American College of Rheumatology (1).

The patients continued their pharmacological treatments (analgesics/NSAIDs, antidepressants, benzodiazepines) throughout the period of the study.

The patients were divided into 4 groups of 10 persons each, trained by the same physiotherapist (CDF) for 8 weeks (2 months), with the sessions (lasting 50 minutes each) repeated twice a week. The assessment was made at baseline (T0) and at the end of the 8-week rehabilitation period (T1).

The "Body movement and perception" method

The "Body movement and perception" is a novel method of group gymnastics (21, 22), derived from RM (18, 19, 20) and from soft gymnastics, based on awareness of body perception, low impact physical exercises, and relaxation. Briefly, the mainstay of the RM, executed in individual sessions, is the relationship between the therapist and the patient, based on the continuous attention to the patient during all the session, regarded as "accompanying posture" (18-20). The therapist maintains and continuously monitors the state of attention and perception of the patient by verbal and manual contacts that help the patient to focus on perception. On her/his part, the patient participates in the session with few active and conscious guided movements, The purpose of the RM is to obtain patient awareness and control of perceptions derived from individual parts of the body, ultimately allowing the patient to modulate the response to pain perception. In RM this effect is obtained by using few body exercises during the sessions.

The BMP method is suitable for treat ing small groups of patients with RM and integrates the principles of RM with low impact body exercises, always respectful of the pain threshold. Some of these have been specifically proposed for the method, and some are derived from soft gymnastics (such as the Eutonie, anti-gymnastique, Feldenkrais method, Yoga) and consist of active exercises of the body, more specifically of the head, trunk, upper and lower limbs and movements of conscious respiration.

Perception of the body

The session begins with the patients in supine positions to help them to focus on perception. Then, each patient, asked by the therapist about their perception of specific body segments, particularly of painful areas, describes the perceived characteristics of these areas in terms of dimensions, weight, consistency and symmetry (body scan). This helps the patient to focus on perception and to maintain a non-judgmental awareness of the sensations arising from the body (Fig. 1a). The patients are then invited to focus on their own spontaneous breathing and on the sensations that it may induce, avoiding interfering with the natural dynamics of breathing. Both the body scan and the focus on breathing allow the patients to reach concentration and relaxation and may be used also to maintain antalgic positions (Fig. 1b). These exercises last about 15 minutes and may be repeated during the session, with a shorter duration, if pain and distress arise.

Exercises in supine, sitting and standing positions

The patients perform mainly exercises in supine positions, that allow to focus on perception. The exercises variously combine movements of lower limbs, upper limbs, head, trunk, and respiration. They can be performed with the help of some devices, such as soft little

balls that, placed under the legs or the back of the patients, may enable them to focus on the perception and movements of those areas.

The exercises are not very different from those performed in standard gymnastic classes, but they should be performed in a fluid, cautious, slow and effortless way, by using the resistance of the ground and the force of gravity, paying attention to the execution of the movement and to the perception. In fact, the patients are asked to describe how they perceive the specific areas involved in the movement and the whole body before and after doing the exercises. For example, after exercises comprising extension and circling of the arms and torsion of the back, the patients will be asked about their perception of the arms, the distance between the scapula and their perception of the back and pelvic girdle (Fig. 1 c-d); after exercises involving flexion and extension of the legs, combined with clockwise and counter-clockwise circular movements of the omolateral ankle and foot, the patients will be asked to describe the sensations arising from both legs, feet and back in terms of length, dimension, weight and support from the ground (Fig. 1 e-f).

After this phase, the patients are asked to assume a sitting posture. After doing a few exercises in this position, they assume an orthostatic state. In the standing position, the patients perform some exercises that combine mainly movements of the trunk with breathing. For example: the patients, with slightly bent knees, crunch the trunk slowly, in synchrony with spontaneous breathing, and extend the arms toward the ground. The patients, then, inspire and expire a few times and slowly go back to the initial orthostatic state. Then, they will be asked to describe their perceptions concerning the posture of the body, its position in the space and the support from the ground (Fig. 1g).

Fig. 1. Exercises from the "Body movement and Perception" method.
a: body scan; **b:** perception of spontaneous breathing in an antalgic position; **c-d:** exercises of trunk and upper limbs in a supine position; **e-f**: exercises of lower limbs in a supine position; **g:** exercises of trunk crunching and respiration in a standing position; **h:** walking in the gymnasium with slow, effortless movements.

Perception of the body during movements and during respiration

The patients, guided by the therapist, are asked to walk in the gymnasium with fluid and loose movements, and to be aware about what they perceive (stiffness, pain, hindrance, etc.). Then, they are asked to introduce exercises of conscious respiration and slow, effortless exercises involving the trunk, legs, arms and head, in order to reach a state of awareness, to reduce pain and stiffness and to improve their range of movement (Fig. 1h).

In the BMP method, the exercise program is not rigidly predetermined, but it is modulated according to the needs of the group and of the single patients, under the careful guide of an experienced therapist trained in RM, who chooses the appropriate movements and exercises, tailoring them to the patients and deciding how to distribute them during the sessions.

Assessment

All FMS patients enrolled were assessed at the beginning (T0) and at the end of the 8-week exercise course (T1), with an self-administered ques-

tionnaire and with a clinical evaluation performed by an operator not involved in the study.

The questionnaire included a visual analogue scale (VAS) 0–10 for the assessment of the intensity of pain, with 0 = "no pain" and 10 = "pain as bad as it could be" and a series of questions regarding: temporal characteristics of pain (continuous pain, intermittent pain, episodic pain), pain interference during working and recreational activities, pain interference in night-time rest, awareness of the pain, general conditions (fatigue, irritability, well-being), quality of the movement, subjective ability to focus on perception and to perceive the whole body, postural self-control, ability to relax mind and body.

The clinical evaluation included the number of tender points, the distribution of pain (localised/widespread), the presence of pain in maintaining the sitting and standing position, the occurrence of pain during postural passages and gait, the postural alignment of the body and the presence of muscular contractures. Moreover, the number of NSAIDs or analgesics assumed in the previous week at T0 and T1 was registered.

Statistical analysis

Data are presented as mean ± standard deviation and as number and percentages. Student's *t*-test and χ^2 test or Fisher's exact test, when appropriate, were used to compare for outcome measures at T0 and T1. Data analysis was performed using the SPSS statistical package 12.0 for Windows.

Table I. Results of the self-administered questionnaire.

	Before treatment (T0)	After treatment (T1)	*p*-value
Pain intensity (0–10) (M ± SD)	6.2 ± 1.35	3.1 ± 1.4	*p*=0.001
Pain temporal characteristic:			
Continuous pain	50% (20 pts)	5% (2 pts)	*p*<0.0001
Intermittent pain	50% (20 pts)	45% (18 pts)	
Episodic pain	0 (0 pts)	45% (18 pts)	
No pain	0% (0 pts)	5% (2 pts)	
Pain during work activities:			
Increased	87.5% (35 pts)	25% (10 pts)	*p*<0.0001
Unchanged	12.5% (5 pts)	75% (30 pts)	
Pain during recreational activities:			
Increased	62.5% (25 pts)	10% (4 pts)	*p*<0.0001
Decreased	17.5% (7 pts)	32.5% (13 pts)	
Unchanged	20% (8 pts)	57.5% (23 pts)	
Interference of pain in night time rest	65% (26 pts)	15% (6 pts)	*p*<0.0001
Awareness of pain	65% (26 pts)	35% (14 pts)	0.0134
General conditions			
Fatigue	92.5% (37 pts)	7.5% (3 pts)	<0.0001
Irritability	17.5% (7 pts)	0% (0 pts)	0.0117
Well-being	0% (0 pts)	15% (6 pts)	<0.0001
Movement quality:			
Stiffness	75% (30 pts)	19% (8 pts)	<0.0001
Agility	25% (10 pts)	80% (32 pts)	<0.0001
Subjective ability to focus on perception:			
Difficult	75% (30 pts)	7,5% (3 pts)	<0.0001
Easy	25% (10 pts)	92,5% (37 pts)	
Ability to perceive the whole body:			
Difficult	70% (28 pts)	25% (10 pts)	0.0001
Easy	30% (12 pts)	75% (30 pts)	
Perceived postural self-control			
Difficult	75% (30 pts)	10 % (4 pts)	<0.0001
Easy	25% (10 pts)	90% (36 pts)	
Ability to relax mind and body			
Difficult	60% (24 pts)	20% (8 pts)	0.0005
Easy	40% (16 pts)	80% (32 pts)	

Results

No drop-out from the study was registered and the attendance rate to the courses was 100% for each lesson throughout the whole duration of the protocol. These data indicate both the safety of the intervention and the high compliance of the patients with the treatment.

FMS patients treated with BMP method for 8 weeks improved in all the items, both those assessed by the self-administered questionnaire as well as those assessed by a clinical evaluation, as shown in Tables I and II.

At T1, with respect to T0, the results of the questionnaire showed: significant reductions in pain intensity and duration (increase, after the treatment, of patients with intermittent or episodic pain and reduction of patients reporting continuous pain); significant reductions of pain during working and recreational activities and during night time rest; significant reduction in awareness to pain as well as in fatigue and in irritability; significant improvement in well-being, in movement quality, in ability to focus on perception, in self-perceiving whole body, in postural control and in relaxing body and mind. Concordantly, the results of the clinical evaluation showed significant reduction in tender point scores, in pain distribution, in pain in maintaining and in changing positions and significant improvements in muscle contractures and in the correct perception of the body alignment (congruence among objective and subjective evaluation of the body alignment). Concordantly with the reduction of pain, also the assumption of NSAIDs and analgesics was significantly reduced.

Discussion

This is the first study assessing the effect of the BMP Method (derived from RM) in a group of FMS patients. The results of this pilot open study show that an 8-week programme with BMP Method is effective in FMS, in what it results able in reducing pain, fatigue and irritability and in improving significantly well-being, movement quality, focusing on perception and in self-perceiving whole body, and also amel-

Table II. Results of the clinical evaluation.

	Before treatment (T0)	After treatment (T1)	*p*-value
Tender point count	14.2 ± 1.5	8.37 ± 2.06	$p<0.01$
Number of analgesics/NSAIDs per week	4.95 ± 2.51	2.77 ± 1.76	$p<0.001$
Distribution of pain			
Localised	70% (28 pts)	90% (36 pts)	0.0482
Widespread	30% (12 pts)	10 % (4 pts)	
Pain in maintaining			
a sitting position	70% (28 pts)	25% (10 pts)	0.0001
a standing position	65% (26 pts)	32.5% (13 pts)	0.0069
Occurrence of pain in the postural passages			
From supine to sitting position	62.5% (25 pts)	20% (8 pts)	0.0002
From sitting position to supine	25% (10 pts)	5% (2 pts)	0.0252
From sitting position to standing position	67.5% (27 pts)	25% (10 pts)	0.0003
From standing position to sitting position	27.5% (11 pts)	0% (0 pts)	0.0004
Pain during gait	55% (22 pts)	30% (12 pts)	0.0411
Correct perception of body alignment	55% (22 pts)	90% (36 pts)	0.0009
Muscles			
Serious contractures	100% (40 pts)	5% (2 pts)	$p<0.0001$
Light contractures	0% (0 pts)	75% (30 pts)	
No contractures	0% (0pts)	20% (8 pts)	

iorates postural control and body and mind relaxation. The improvement in pain perception is indirectly confirmed by the significant reduction in the assumption of NSAIDs and analgesics.

Moreover, it is effective in reducing tender point scores and muscle contractures and in improving perception of body alignment. Thus, our study suggests that the BMP method is effective in patients affected by FMS.

Our results are in agreement with those obtained by rehabilitating patients with aerobic exercises, muscular strengthening or stretching (17, 23, 24, 25, 26). However, it may be observed that these procedures, although ameliorating cardio-respiratory parameters, did not improve specific FMS symptoms and risked exacerbating pain (27, 28). Although pain derived from these exercises does not have long-term effects over the course of the disease, it was observed that after 24 hours, the pain did not return to pre-exercise level (29). Moreover, cardio-respiratory improvement does not seem to be directly related to an improvement of FMS-specific symptoms (30). Thus, physical activity is not sufficient, and, in some cases, not even adequate for FMS treatment (31). Physical exercise could, however, be useful to train FMS patients, positively interfering in a vicious circle "pain - reduced movement". But, in order to be really effective, exercise should be done with constancy. It is difficult to motivate a FMS patient to introduce an activity that often exacerbates pain into his daily life habits (32). This can explain the high drop-out percentages that characterise studies evaluating physical exercise in FMS patients (33, 34). The incidence of drop-outs may be lowered by individualising and tailoring the exercises according to patients personal limits (35) and by using different approaches, such as hydrotherapy (36, 37), which can improve, even though for a short period, pain, health status and tender point counts (37).

In FMS, encouraging results were obtained by the application of mind-body methods, such as CBT, particularly useful in highly distressed patients (7, 9). Other mind-body methods, such as Mindfulness Meditation (11), Body Awareness Techniques, Tai Chi and Qi Gong (12, 14-16) were shown to be efficacious on FMS. Recently, also Ai Chi, applying the principles of Tai Chi in water, was useful in improving FMS symptoms and sleep quality (38).

In FMS patients, we demonstrated the efficacy of RM (18, 19), a physiotherapy method resembling mind-body methods, tailored to patients' needs and accessible also to patients suffering from severe forms of FMS, which aims to obtain patient awareness and control of body perceptions, thus reaching a modulation of responses to pain. RM improved pain, FMS-related disability, HRQoL, movement quality, sleep, relax ability and reduced analgesic assumption, with the results maintained after a 6-month follow-up (20).

The BMP method integrates RM with low impact exercises guided by a therapist skilled in RM who graduates the exercises, while being attentive to pain threshold, on the basis of patients' possibilities, thus avoiding pain and fatigue. This is of importance in order to motivate FMS patients and to improve their compliance with the treatment. In fact, the ability to perform exercises is related to a lower probability of drop-out from therapy (33) and exercises tailored on patients' individual possibilities guarantee a higher adherence to the programme of physical therapy (39, 40).

In our study, unlike other interventions, no drop-out was registered and the attendance rate to the courses was 100% for each lesson throughout the duration of the protocol. Thus, the BMP method is a safe technique. The safety of the method, together with the tailoring of the exercises, may explain the excellent compliance of the patients with the treatment. On the other hand, we are aware that the individualisation and the tailoring of the exercise may make it more difficult to identify the best treatment protocol and to standardise the technique.

It was also shown that patients are more prone to achieve better therapeutic results when they receive the support of others (33), thus group activities are preferable to self-managed exercises and programmes (25, 41). A 3-week group multidisciplinary intensive residential treatment (including aerobic exercise and cognitive behavioural therapy) showed a one-year efficacy in improving pain and aerobic fitness (42). On the contrary, simple educational programmes administered with physical exercises turned out to be useless in motivating patients to continue therapy (43).

The BMP method is not only based on exercises graded on patients' possibili-

ties, but also on the education to focus on awareness of body perceptions, in a comfortable group environment. The exercises are not part of a standardised protocol, but may vary each time to suit the needs of the group and to stimulate individual ability.

For its efficacy and for its characteristics of low impact physical activity to be performed in group, the BMP method can be regarded as a non-pharmacological intervention particularly useful in FMS patients who are unable to deal with standard training programmes or who already performed a cycle of treatment with RM, of which it may be considered a sort of maintenance therapy (20).

Although showing promising results, our study has some limitations such as its open design and the small number of patients involved.

The evaluation with specific standardised clinimetric instruments to assess outcome in HRQoL, disability and pain may also be regarded as a limitation of the study. However, our pilot experience was focused to assess whether the BMP method might have an impact on the awareness of body perceptions, in particular of pain perception, and might lead to a modulation of responses to pain, more than to evaluate its effects on disability and HRQoL. In a recent work, we demonstrated the efficacy on FMS patients of RM on pain (assessed by Regional Pain Scale and VAS), disability (assessed by Fibromyalgia Impact Questionnaire-FIQ-), HRQoL (assessed by Short Form 36 -SF36-) (20).

Another limitation may be represented by the lack of a follow-up period. However, the personalised and tailored exercises done by FMS patients treated for 8 weeks with RM, maintain the effects obtained at the end of the intervention also after a 6-month follow-up (20). Studies on larger groups of patients, with a control group and with a longer follow-up conducted with specific clinimetric instruments are needed to confirm the efficacy of the BMP method on all the wide array of FMS symptoms.

Conclusion

In FMS patients, a 8-week rehabilitation period using the BMP method improved pain, fatigue, irritability general well-being, movement perception, postural control body and mind relaxation, tender point, body alignment, muscle contractures and assumption of NSAIDs and analgesics.

Based on our results, the BMP method could be a useful exercise group treatment to be used in conjunction with drug therapy in managing FMS, especially after individual treatment with RM.

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