

Effects of whole body vibration therapy in pain, function and depression of the patients with fibromyalgia



Alp Alev*, Adalı Mihriban, Efe Bilge, Elyıldırım Ayça, Karabulut Merve, Coşkun Şeyma, Ertem Uğur, Bilgiç Adnan, Karakullukçuoğlu Zeynel, Günay Selim Mahmut

Uludağ University Physical Therapy and Rehabilitation Department, Küçüközü, 16080, Bursa, Turkey

ARTICLE INFO

Article history:
Received 10 April 2017
Received in revised form
2 June 2017
Accepted 29 June 2017

Keywords:
Exercise
Fibromyalgia
Pain
Vibration

ABSTRACT

Aim: Aim of the study is to search the effects of whole body vibration (WBV) in fibromyalgia patients. *Materials and Methods:* In this single blind study 20 fibromyalgia patients were diagnosed according to 2010 American College of Rheumatology criteria whom participated in the study with the mean age of 57 ± 7 (years). Participants were randomized into 2 equal groups. In the intervention group ($n = 10$), 6 different types of exercises were combined with 30 hz frequency, 2 mm amplitude WBV for 4 weeks, The control group ($n = 10$) performed the same exercises on the same platform without vibration. The patients were assessed at baseline, at the 3rd and 6th months by Visual Analogue Scale (VAS), Fibromyalgia Impact Questionnaire (FIQ) and Beck Depression Inventory (BDI). *Results:* Only FIQ score was significantly better in the treatment group at the 6th month evaluation ($p = 0.043$). *Conclusion:* WBV is found to be effective in reducing symptoms of fibromyalgia.

© 2017 Elsevier Ltd. All rights reserved.

1. Introduction

Fibromyalgia is a persistent widespread musculoskeletal pain syndrome with regions of localized tenderness [1]. The regions of painful areas consist of 19 parts of the body according to ACR 2010 classification criteria. In addition, some symptoms must accompany for at least 3 months with no other health problems to explain. These symptoms are fatigue, waking unrefreshed and cognitive problems (memory etc) in addition to severity grading [1].

It affects %4 of people, women in the middle adulthood more often than men [2]. In addition, a recent Turkish study indicates the increase in prevalence with age [3]. Chronic pain and autoimmune diseases may trigger or exacerbate the symptoms. The search results highlight also the specific features of depression in patients with fibromyalgia. Among these patients, the current and 12 month prevalence of major depression has been reported 20–30% in various studies; approximately 10 times more than general population [4]. The diagnosis is made with careful examination. Laboratory and radiographic evaluation is done to rule out the other health problems rather than to fix the disease. Though there is no

permanent healing, there are some symptomatic medical or physical therapy agents in addition to regular physical exercise used in amelioration of non-REM sleep disorders in these type of patients [5].

Whole body vibration (WBV) is a platform that oscillates at a particular frequency and amplitude causing muscle contractions and neuro stimulation shown to improve muscle strength [6], body balance [7], bone density [8], and pain [9] in various populations. The mechanism behind these effects are searched and found to be related with proprioceptive stimulus on muscle spindles and golgi tendon organs. These stimuli may improve tonic and antagonist vibration reflexes with additional beneficial consequences. The rationale for this investigation was to reveal the short and long term effects of WBV on pain and physical status. It was hypothesized if supplementing 4 weeks WBV therapy with exercise resulted in greater improvement in any of the physical and mental scales over an exercise group alone.

2. Materials and Methods

24 patients were assessed for eligibility. 1 of them refused to participate and 3 of them did not meet the inclusion criteria. Therefore, 20 fibromyalgia patients diagnosed according to 2010 American College of Rheumatology criteria were included in the

* Corresponding author.
E-mail address: dr.alevalp@gmail.com (A. Alev).

study. After getting the University Hospital Ethical Community Approval, the subjects were given informed written consent and were recruited from the outpatient unit of our physical therapy and rehabilitation department. Exclusion criteria were the presence of inflammatory rheumatic or infectious diseases, cardio-respiratory disorders, psychiatric diseases, new fractures and degenerative joint diseases. The assessing therapist was blind. The randomisation in this single blind study was done by a computer generated table of random numbers in which participants were randomized into 2 equal groups. In the intervention group ($n = 10$), exercise training was combined with WBV for 4 weeks, twice a week, 30 hz frequency and 2 mm amplitude. There were 6 different kinds of exercises; 30 s each and 6 repeats. The control group ($n = 10$) performed the same exercises without vibration on the same platform (Fig. 1).

The exercise protocol consisted of dynamic (isotonic) and static (isometric) muscular contractions. The muscles of lower extremity were used for the involved tasks; a) static squat at 100° of knee flexion b) dynamic squat between 90 and 130° knee flexion for every single leg c) dynamic squat between 90 and 130° knee flexion for both legs at the same time d) ankle flexion-extension while knees are 100° flexed position e) squat at 100° of knee flexion shifting the body weight from one leg to another. These 6 different types of exercises were performed synchronously, 30 s each and 6 repeats with a recovery of 3 min between repetitions.

The device for controlled whole body vibration is called 'Complex Winplate' and it is intended solely for vibration training. It has been manufactured by Uniphy Elektromedizin GmbH and CoKG according to international quality standards of the ISO 9001:2000 and DIN EN ISO 13485:2003. It is a round platform with supporting bars for holding with both hands during the tasks. The platform produces vibrations and the intensity is chosen based on previous literature [6–10]. The frequency is decided to be 30 hz because frequency lower than 20 hz may evoke muscular relaxation and frequency ≥ 50 hz may cause muscular soreness and unpleasant sensations [10]. The subjects hold the supporting bars as long as they stand on the platform.

The baseline, 3rd and the 6th month assessments were done by Visual Analogue Scale (VAS), Fibromyalgia Impact Questionnaire (FIQ) and Beck Depression Inventory (BDI). A recent Turkish study which revealed the relationship between quality of life and some variables found negative correlation with VAS for pain, FIQ for functional status and BDI for depression and anxiety [11]. BDI

Table 1
Demographic characteristics of the fibromyalgia patients.

	WBV Group (Mean \pm SD)	Control Group (Mean \pm SD)
Age (years)	56.2 \pm 3.2	58.1 \pm 2.3
BMI (kg/cm ²)	27.9 \pm 1.6	28 \pm 1.2
Duration of diagnosis	8.2 \pm 0.5	8.9 \pm 1.5

WBV: Whole Body Vibration, BMI: Body Mass Index.

consists of 21 questions and higher scores mean severe depression [11,12]. FIQ consist of 10 items and higher scores indicate greater impact of fibromyalgia on functioning [11,12]. VAS is a 0–10 points scale for assessment of pain. 0 means 'no pain' [11,12].

2.1. Data analysis

The normality of data between groups was evaluated with Shapiro-Wilk test and categorical variables; such as age characteristics were compared with independent *t*-test and the uncategorical variables were compared with Mann-Whitney *U* test. Descriptive statistics between outcome measures were defined as 'Median (Minimum-Maximum)' for continuous variables. Data analysis was done by IBM SPSS Statistics 21 programme. Sample size calculation is done by One sample *t*-test power analysis.

3. Results

3 of the 24 patients were drop-outs; 2 of them had other comorbidities and one of them was having another treatment. 1 patient refused to participate and therefore 20 patients were included in the analysis of whom completed the 6 months intervention.

The mean age of the 20 fibromyalgia subjects were 57 ± 7 years and demographic variables such as age, body mass index and duration of illness were homogeneous for both of the groups ($p > 0.05$) (Table 1). When the groups were compared with each other, no significant difference was found between the variables at baseline, 3rd and 6th month evaluation except FIQ scores. FIQ score was significantly better in the treatment group at the 6th month evaluation ($p = 0.043$) (Table 2). According to the sample size calculation, the difference between the mean values was 13.40 ± 13 standard deviations with the power of 80% for FIQ scores ($\alpha = 0.05$).

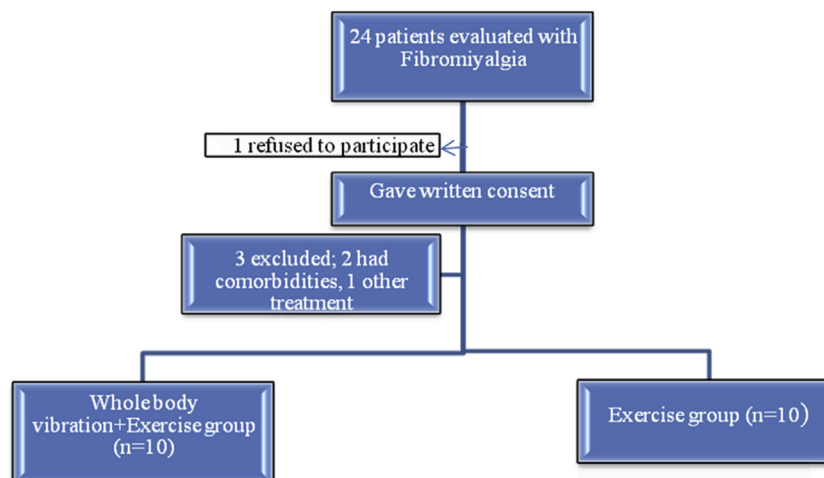


Fig. 1. Patients Flow diagram.

Download English Version:

<https://daneshyari.com/en/article/5565104>

Download Persian Version:

<https://daneshyari.com/article/5565104>

[Daneshyari.com](https://daneshyari.com)