Joint Physical Examination (Colorado Scale) of Osteoporotic Haemophilia A Patients After Resistance Training and Pulsed Electromagnetic Fields(PEMFs)

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Introduction:

Haemophilia A is characterized by recurrent haemorrhages in the musculoskeletal system. This leads to progressive cartilage degradation and changes to the bone, resulting in haemophilic arthropathy associated with chronic pain, reduced muscular performance, and functional disability [1]. Resistance training is a good choice for increasing muscle strength; the resultant joint stability could decrease the frequency and severity of bleeding episodes and associated pain and contracture [2]. PEMFs may stimulate circulation and bone synthesis and decrease pain effectively that caused the better joint function in problematic joints of hemophilia patients [3].This study was aimed to assess the effects of six weeks resistance training (RT) and pulsed electromagnetic fields (PEMFs) on joint physical characteristics in hemophilia A patients with osteoporosis.

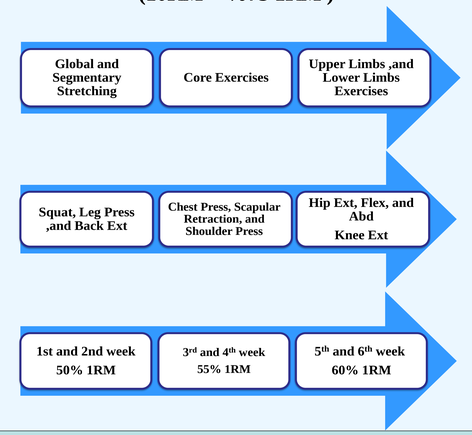
Methods:

This study was a randomized controlled trial. Forty-eight patients with severe hemophilia A; aged 20–35 years; no history of an inhibitor; T-score ≤–2.5; were randomly assigned to resistance training with placebo PEMFs (RT, n=13), resistance training with lower repetition combined with PEMFs (RTPEMFs, n=12), PEMFs (n=11), and control (n=12) groups. Exclusion criteria included the following: acute synovitis; and participation in regular physical training activities (more than two times per week) in the previous six months.

Resistance training consisted of a total of 18 sessions over a six-week period; sessions occurred three times a week, and each training session lasted 30–40 minutes. Subjects performed 10 repetitions of each exercise during the first, third and fifth weeks and 15 repetitions of each exercise during the second, fourth and sixth weeks of training. Rest time between repetitions was 10 seconds and between each muscle group exercise was 1–2 minutes. In the RTPEMF group, the intensity of the resistance exercises was similar to that for the RT group, but there were five repetitions of each exercise in the first, third and fifth weeks and 10 repetitions during the second, fourth, and sixth weeks of training. PEMFs (30 Hz and 40 Gauss, Rectangular waveform) was exposed to PEMFs and RTPEMFs groups for 60 and 30 min, respectively.

Joint physical characteristics, using Modified Colorado questionnaire was measured before and after the program.

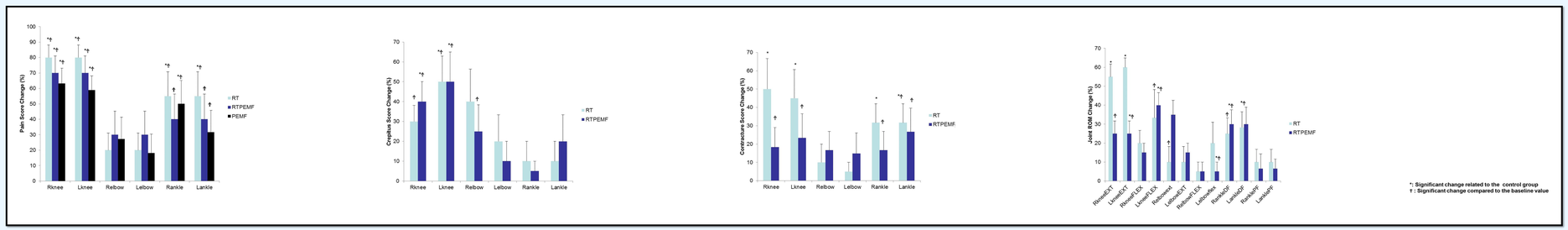
Figure 1. Progressive Resistance Training Protocols (10RM = %75 1RM)



Results:

Joint range of motion, muscle contracture, crepitus and pain improved significantly in the RT and RTPEMFs groups compared with the control group and baseline values . PEMFs could reduce pain significantly in the right and left knees (63% and 59%, respectively) and right and left ankle joints (50% and 31%, respectively).

Graph 1-4 .Colorado SubScore Change in the four groups



Conclusions:

Site specific resistance training can improve joint function, and diminish pain in severe hemophilia patients with osteoporosis. Application of resistance training with lower repetition combined with PEMFs and PEMFs may be useful for improving joint physical characteristics in patients with haemophilia who are reluctant to participate in training protocols because they fear an increased risk of rebleeding.

References:

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