



Original article

Safety of fascial therapy in adult patients with hemophilic arthropathy of ankle. A cohort study

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ABSTRACT

Background: Hemophilic arthropathy is characterized by loss of function and chronic pain. Fascial therapy mobilizes the connective tissue, intervening in the state of the injured fascial complex and the surrounding tissues. **Objectives:** The aim of this study is to evaluate the safety of a physiotherapy program through fascial therapy in adult patients with hemophilic ankle arthropathy.

Design: Prospective cohort study.

Methods: Twenty-three adult patients with hemophilia from 26 to 65 years of age were recruited. The intervention consisted of three sessions of 45-minute fascial therapy for three consecutive weeks. An evaluation was carried out before as well as after treatment. The study variables were joint status (assessed with *Hemophilia Joint Health Score*), joint pain (using visual analogue scale), ankle range of motion (with a universal goniometer) and bleeding frequency (administering self-registration of bleeding). The mean difference was calculated using the Student's t-test for paired samples and using the Cohen formula we calculated the effect size of the dependent variables.

Results: None of the patients developed muscular or articular bleeding during the treatment period. After treatment, significant improvements ($p < 0.05$) in plantar flexion, ankle pain under load and joint condition were observed in both ankles. Similarly, we found improvement in left ankle dorsiflexion.

Conclusions: The application of physiotherapy through fascial therapy does not appear to produce muscle or joint hemorrhages. A treatment through three sessions of fascial therapy may improve joint pain, mobility and joint ankle condition in patients with hemophilic arthropathy.

1. Introduction

The main clinical complication of hemophilia is the development of joint bleeds, mainly in knees, ankles and elbows (Goddard and Mann, 2007). The recurrence of joint bleeding induces biochemical and enzymatic alterations, hypertrophy of the synovial membrane and, ultimately, degenerative joint injury (hemophilic arthropathy) (Valentino et al., 2008).

The main clinical manifestations in patients with hemophilic arthropathy are loss of joint mobility, chronic pain and muscular atrophy (Stephensen et al., 2009). The ankle joint is the location that undergoes the highest number of bleeding episodes throughout childhood, being

the most affected joint in hemophilic arthropathy during adolescence (Gamble et al., 1991). The minimum range of movement needed by this load-bearing joint for normal gait performance is 10° dorsal flexion (Ribbans and Rees, 1999). However, in hemophilic arthropathy population, mobility is affected at an early stage. In connection with intraarticular deterioration, and the impairment of periarticular structures, chronic ankle pain is reported as one of the variables that most interferes in a patient's daily life (van Genderen et al., 2005) and is a predictor of disability in patients with hemophilia (van Genderen et al., 2006).

Prophylactic treatment has shown to be the most effective approach for the prevention of hemophilic arthropathy (Manco-Johnson et al.,

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2007). However, when injury is already established, physiotherapy techniques, and ultimately orthopedic surgery, are the only resort. Recently it has been suggested that studies are needed to demonstrate the safety and efficacy of physiotherapy in the treatment of hemophilic ankle arthropathy (Cuesta-Barruso et al., 2013). In recent years, several studies have been published (Cuesta-Barruso et al., 2014a,b) that confirm the scientific evidence of different manual therapy techniques in the treatment of patients with hemophilic arthropathy of the ankle.

Fascial therapy is indicated in the treatment of chronic degenerative lesions (Harlapur et al., 2010; Tozzi et al., 2011). This method of treatment mobilizes the soft tissues, placing special emphasis on the connective tissue. Fascial therapy includes different gliding techniques using light loads applied in a specific way. The aim is to manipulate the fascial complex over long periods of time, to improve tissue mobility, pain, and joint, muscular, and proprioceptive functionality (Pilat, 2003). Fascial therapy in patients with hemophilia is contraindicated due to the risk of developing muscle or joint hemorrhages as a result of superficial, deep or telescopic techniques typically applied with this therapy.

This study aims to evaluate the safety of a physiotherapy intervention through fascial therapy in adult patients with hemophilic ankle arthropathy.

2. Methods

2.1. Study design

Prospective cohort study to assess the safety of a physiotherapy program using fascial therapy in adult patients with hemophilic ankle arthropathy.

2.2. Patient recruitment and selection

Patients were recruited from three Hemophilia Associations: Santiago de Compostela, Vigo and Madrid (Spain), between October 2016 and February 2017.

The inclusion criteria for participating in the study were: patients over 18 years of age, diagnosed with hemophilia A or B, and having a medical diagnosis of hemophilic ankle arthropathy (Petterson radiological scale score greater than 4 points on each ankle). On the other hand, patients who were receiving other physiotherapy treatments were excluded from the study, as well as those presenting with hemarthrosis during the study and patients who failed to sign the informed consent document. Patients who had developed antibodies to FVIII or FIX (inhibitors), as well as patients without prophylactic treatment by administration of clotting factor concentrates (on demand treatment) also qualified to participate in the study.

Table 1
Protocol to myofascial therapy in the treatment of hemophilic arthropathy of the ankle.

Type	Manoeuvre	N	TP	TA	Comments	Time
Superficial	Superficial sliding on the plantar fascia	3	3	–		1-2Min.
	Superficial sliding anterolateral part of the leg	3	1	2	The strokes are performed assisted by slight movements of dorsiflexion and plantar flexion by the patient	1-2Min.
	Pressure and sliding on the posterior region of the leg	3	1	2	The strokes are performed assisted by slight movements of dorsiflexion and plantar flexion by the patient	1-2Min.
	Release of the popliteal fascia	1	5	–	Movements applied to the popliteal region	1-2Min.
Type	Manoeuvre				Comments	Time
Deep	Induction of plantar fascia				Overcome 3 restriction barriers	3-5Min.
	Induction of ankle anterior compartment				Overcome 3 restriction barriers	3-5Min.
	Induction of sural triceps muscle				Overcome 3 restriction barriers	3-5Min.
	Telescopic manoeuvre				Degravitation and slight traction of the lower limb	5-7Min.

Notes: Type, Type of manoeuvre; N, number of strokes (total sliding manoeuvres to be performed); TP, passive stroke (stroke made passively over the superficial fascia without assistance by the patient and usually applied in the sense of restraint); TA, assisted Stroke (assisted strokes with the patient's cooperation). All manoeuvres will be performed in both lower limbs.

2.3. Ethical considerations

The study was approved by the Ethics Committee of the Universidad Católica San Antonio de Murcia (24/04/15). All patients signed an informed consent document, according to the Declaration of Helsinki, after receiving the study information from the head researcher. This study was classified by the Spanish Agency of Medicinal and Health products as a *Post-authorization observational study of prospective follow-up*. The study was registered in the International Clinical Trials Registry (ClinicalTrials.gov Identifier: NCT02825667).

2.4. Intervention

The patients were treated with the administration of three 45-minute physiotherapy sessions (once a week for 3 weeks). The physiotherapy intervention was carried out by two physiotherapists with experience in fascial therapy and hemophilia. The treatment, as described by Meroño-Gallut and Cuesta-Barruso (2016), included the application of six superficial and four deep techniques. This protocol is administered by superficial glides on the ventral and dorsal area of the leg, and on the popliteal hollow, as well as by applying deep and telescopic techniques to the lower limb. The complete contents of the intervention is shown in Table 1.

2.5. Measurement instruments

Assessments at baseline and after the intervention were carried out by a physiotherapist with experience in the treatment of patients with hemophilia. The dependent variables measured in the present study are: frequency of bleeding, joint condition, perception of pain and ankle ROM.

At baseline, patients were given a self-record of bleeding and a telephonic follow-up was carried out over the 48 h following each treatment session. In this way, intervention safety was assessed, in terms of the occurrence of muscle and joint bleeding in the treatment area.

The *Hemophilia Joint Health Score 2.1* (HJHS) was used to measure joint condition (Feldman et al., 2010). This scale that includes eight items (*joint swelling, duration of swelling, muscle atrophy, strength, crepitus on motion, flexion and extension loss, and pain*), scores from 0 to 20 points per joint (the higher the score, the greater the degree of joint deterioration).

To evaluate the perception of ankle pain, the visual analog scale (VAS) was used, ranging from 0 to 10 (0 is no pain and 10 is the maximum pain imaginable for the patient). This scale, without any numerical identification to show the scores, was administered asking patients for their perception of load-bearing and non-load-bearing ankle pain in the last month.

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