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MBT AS THERAPEUTIC SHOE FOR ANKLE INSTABILITIES

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Key words: MBT, ankle, treatment, fizioterapie, recuperare
Abstract: Top priority in the treatment of chronic ankle instability is given to the optimum strengthening of the muscles surrounding the ankle joint -- initially in physiotherapeutic sessions, later in daily training -- so that the malfunction of the ligaments can be dynamically compensated and the ankle joints can be functionally re-stabilised.

Introduction

Top priority in the treatment of chronic ankle instability is given to the optimum strengthening of the muscles surrounding the ankle joint -- initially in physiotherapeutic sessions, later in daily training -- so that the malfunction of the ligaments can be dynamically compensated and the ankle joints can be functionally re-stabilised.

Method

Various studies have shown that MBT has great potential as a training device for the musculature, especially in the region of the lower extremities. The aim of the present study is to investigate whether the subsequent functional treatment of patients with chronic ankle instabilities using MBT has a better, equal or worse outcome in comparison to the existing therapy.

In order to study the functional effectiveness of two different therapies, a sample of 30
voluntary patients was selected. These subjects had a diagnosed chronic ankle instability with corresponding symptoms, and were therefore receiving physiotherapeutic treatment as prescribed by their doctors.The sample was randomised for gender, age and sporting activity and divided into one active treatment group (15 subjects with MBT) and into one control group (15 subjects with conventionally therapy and without MBT).

Both groups received 9 sessions of physiotherapeutic treatment, each having the same duration, for approximately four weeks. In the active treatment group, the MBT was integrated into the

physiotherapeutic treatment. This means that all therapeutical exercises were performed with the MBT. Immediately before starting the therapy, the subjects of the active treatment group received professional instructions on how to use the MBT in everyday life. During the therapy phase, the subjects of the active treatment group could gradually begin wearing the MBT in their normal everyday life as well. The control group carried out the therapeutic exercises conventionally (without MBT) on a soft surface or on the soft therapy mat.

After the four-week long physiotherapeutic treatment block, the active treatment group had to wear the MBT during three months, as often as possible, in everyday life. The control group had, likewise over a period of three months, to carry out the established therapeutic exercises independently at home every day (home programme).

The subjects of both groups were examined as to biomechanical/functional parameters immediately before the physiotherapeutic treatment, immediately after completion of the nine therapeutic sessions, and three months after completion of the therapeutic measure; in this way, the functional stability of the ankle joints could be objectively quantified.

The following biomechanical relevant parameters were measured:

• The maximum strength during inversion/eversion of the foot and the maximum strength during flexion/extension of the foot, using isokinetics.

• The extent of the pronation and supination movement of the foot while walking barefoot on a soft, insecure surface (2-D kinematics).

• The fluctuations of the centre of force in the one-legged stance, barefoot on a hard surface using a pressure measuring system (FootScan, ellipse area covering 50% of measuring points and other parameters).

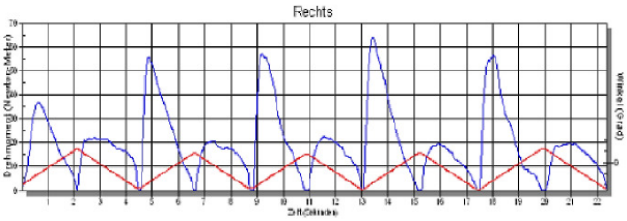
• Maximum pressure coefficient (medial/lateral) under the rearfoot and forefoot, respectively, while walking on a hard surface.

Quantification of functional stability is based on measuring the maximum strength of the

muscles surrounding the ankle joint. Therefore, the maximum torques which the subjects were able to produce at an isokinetic machine (Cybex), both in flexion/extension and in inversion/eversion of the foot, were measured. The torques were measured with a limitation of the angular velocity to 30º/s. The mean of 5 test runs was used as the parameter. The test set-up s depicted below.

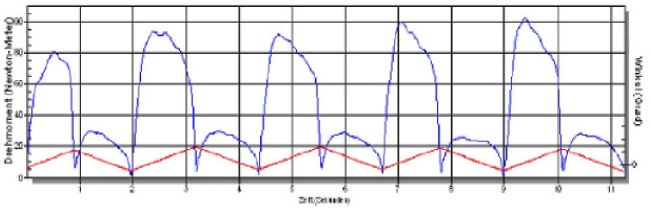
Inversion

Eversion



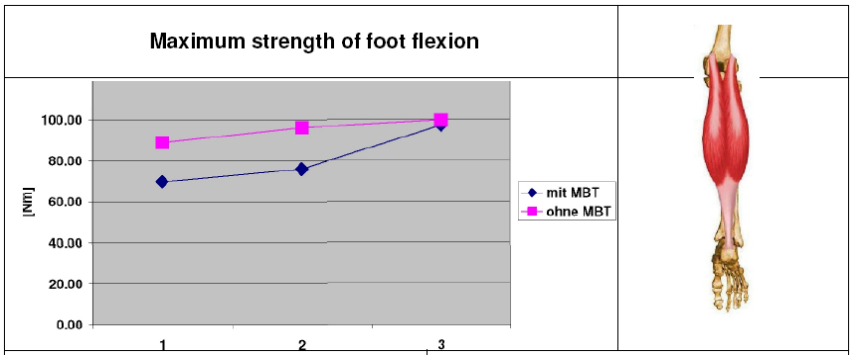
Flexion

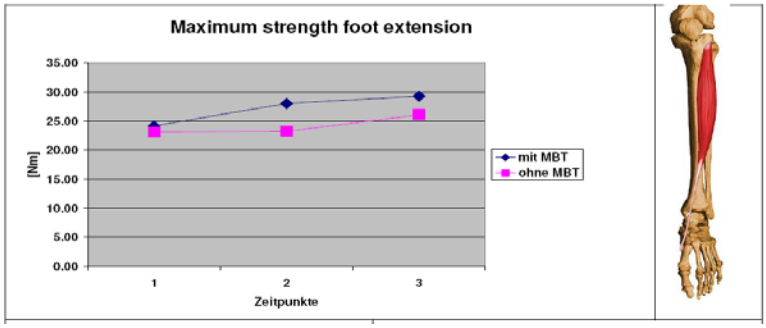
Extension



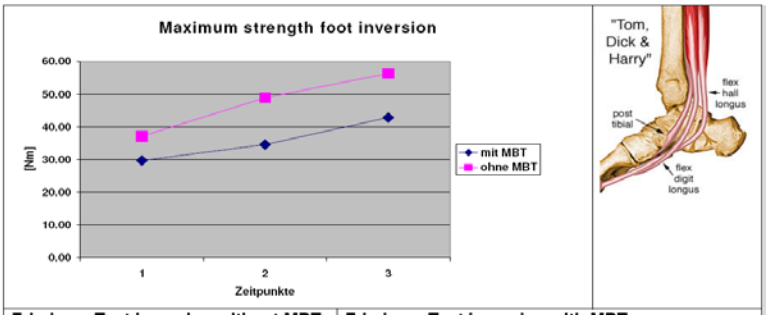
Results:

Intensive wearing of the MBT had led to a significantly greater increase in strength of the foot flexors (mainly triceps surae muscle) compared to the conventional home programme in the three months after physiotherapy.

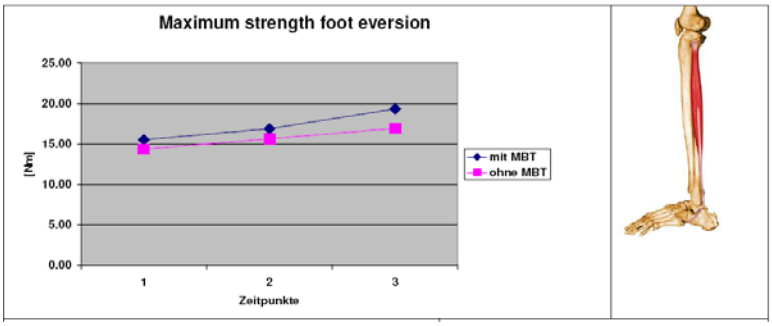




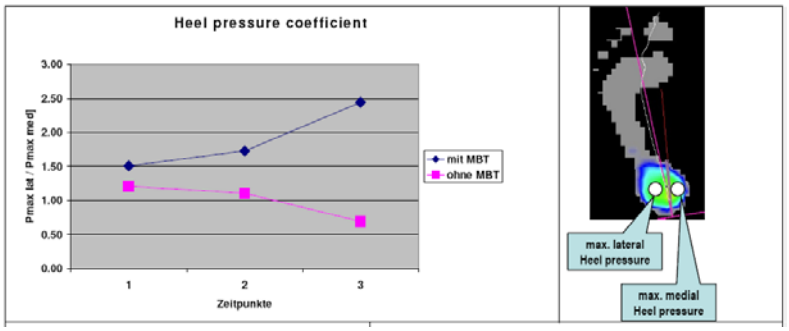
Wearing the MBT had no significant effect on the course of therapy with regard to the maximum strength of the foot extensors.



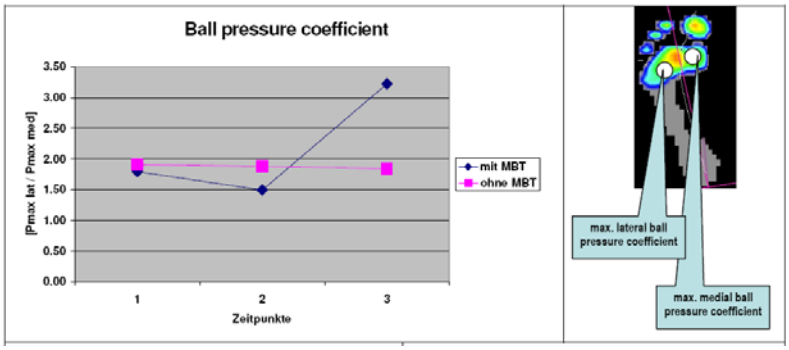
MBT had no significantly greater effect on the increase in maximum strength of the invertors than the conventional therapy or the subsequent conventional training.



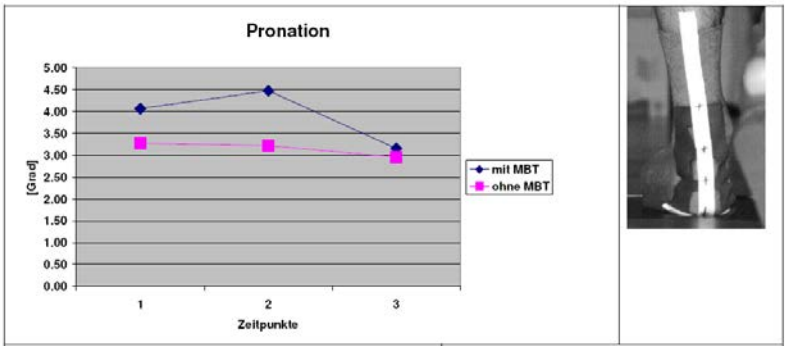
By wearing MBT intensively, the active treatment group showed a significantly greater increase in strength compared to the control group, three months after the end of the physiotherapeutic intervention. This shows that the long-term therapeutic success with MBT regarding the training of the peroneal muscles was significantly greater.



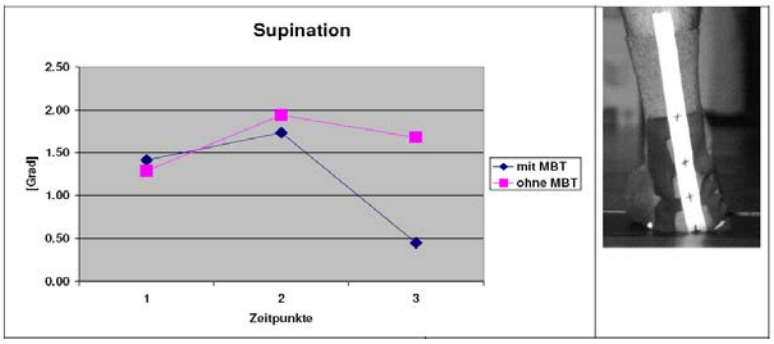
At the end of the study period – three months after the end of the physiotherapeutic intervention – the active treatment group using MBT had significantly increased the load in the medial heel region in the brake phase, while the mediolateral pressure distribution remained unchanged in the control group.



This means that the active treatment group at the end of the study period has pushed off markedly stronger with the medial forefoot, while the pushing-off on the forefoot remained unchanged in the control group.



Wearing MBT in the three months after physiotherapy resulted in a significant reduction of the pronation movement, while the conventional training did not bring about any further improvement.



Wearing MBT three months after the end of physiotherapy led to a significant reduction of the supination movement, while at the same time the conventional home training resulted in an increase of the supination movement.

Interpretation

The results showed that immediately before and immediately after the physiotherapeutic
intervention no significant differences between the active treatment group and the control group were measured. However, three months after the end of the physiotherapeutic intervention the active treatment group showed a significantly higher maximum strength both in the pronators (peroneal muscles) and in the muscles of the calf (triceps surae). Accordingly, a significantly smaller supination movement in the first half of ground contact and a significantly higher mediolateral pressure coefficient (higher medial pressure), both under the heel and under the forefoot, were found. The pronation movements were reduced in both groups at the end of the entire study period. Thus, three independent measurements showed that the use of MBT over a period of
three months after the end of the physiotherapeutic intervention resulted in a functionally superior stabilisation of the ankle joints compared to conventional therapy. Thus MBT can be easily integrated into the physiotherapeutic management of chronic instable ankle joints without any negative effects, although a professional introduction into the use of MBT is essential. However, the impressive benefits of wearing MBT only become apparent in the phase after the physiotherapy. At that stage, patients have the opportunity to daily wear the MBT over several hours. In this way, by far better and more efficient stability training can be carried out compared to conventional home training programmes.

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Titlu: MBT ca încălţăminte terapeutică pentru instabilităţile de gleznă.
Cuvinte cheie: MBT, glezna, tratament, fizioterapie, recuperare.
Rezumat: Prioritatea în tratamentul de instabilitate cronică de gleznă trebuie acordată consolidării muşchilor din jurul gleznei – iniţial în sesiuni de fizioterapie, mai târziu în pregătirea de zi cu zi -, astfel încât disfuncţia ligamentelor poate fi compensată dinamic şi articulaţiile gleznei pot fi funcţional restabilizate.

Titre: MBT as chaussure thérapeutique des instabilités de cheville.
Mots - clé: MBT, la cheville, le traitement, la physiothérapie, de réadaptation.
Résumé : La priorité absolue dans le traitement de l'instabilité chronique de la cheville est donnée au renforcement optimal des muscles entourant l'articulation de la cheville - d'abord à des séances de physiothérapie, plus tard dans l'entraînement quotidien - de sorte que le dysfonctionnement des ligaments peuvent être dynamiquement compensée et les articulations de la cheville peut être fonctionnellement re-stabilisé.