MBT as Therapeutic Shoe for Ankle Instabilities

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MBT Model: Sole 2005

ABSTRACT

The top priority in the management of chronic ankle instability is the optimal strengthening of the muscles surrounding the ankle joint, initially in physiotherapy, then in daily training, so that the impaired function of the ligaments is dynamically compensated for, and the ankle joints can be functionally re-stabilised. According to previous studies, MBT has a significant potential to train the muscles surrounding the ankle joint. Therefore, the present study aimed at investigating whether the use of MBT as a therapeutic training device in cases of chronic unstable ankle joints results in superior mid-term and long-term dynamic stability compared to conventional therapy.

30 subjects with diagnosed, chronic ankle instabilities were randomised in an active treatment group (therapy with MBT) and a control group (without MBT). The active treatment group received subsequently nine physiotherapy sessions – each lasting 30 minutes – in which MBT was used for the various exercises. Likewise, the control group received nine physiotherapy sessions – each of 30 minutes duration – during which all exercises were carried out in the traditional way on a soft surface, without MBT. Subsequently, the active treatment group had to wear MBT over a period of three months during daily living as frequently as possible. During the same period of time, the

control group had to carry out the home training programme usually prescribed by the Praxisklinik Rennbahn every day. The two groups were biomechanically and functionally examined and quantified at the following times: a) immediately prior to the start of physiotherapy, b) immediately after the end of the nine physiotherapeutic sessions and c) three months after the end of the physiotherapeutic intervention. 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.

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 calf muscles (triceps surae). Accordingly, a significantly smaller supination movement in the first half of ground contact and a significantly higher medio-lateral 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 unstable 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, a maximal efficient and by far better training can be carried out compared to conventional home training programmes.