ABSTRACT

BUNDES KONGRESS PHYSIOTHERAPIE
PHYSIO DEUTSCHLAND
Deutscher Verband für Physiotherapie (ZVK) e.V.
18.– 20. SEPTEMBER 2014
VAN DER VALK HOTEL BERLIN-BRANDENBURG
WWW.BUNDESKONGRESS-PHYSIOTHERAPIE.DE
PHYSIOTHERAPIE IN BEWEGUNG
IMPULSE SETZEN – FORTSCHRITT GESTALTEN

Ultrasound-induced modulation of collagen tissue as treatment of carpal tunnel syndrome (CTS)

Karl Lorenz Konrad, Co-Author: Prof. Dr. Dietmar Schmidtbleicher

Ultrasound-induced modulation of collagen tissue as treatment of carpal tunnel syndrome (CTS)

Background
The carpal tunnel syndrome (CTS) is the most common bottleneck syndrome in a peripheral nerve. Further, it is the second most common outpatient surgical procedure. The ultrasound-induced modulation (UI KM) of the flexor retinaculum is an innovative physiotherapeutic method, which aims on decompression of nervus medianus, analogous to surgical interventions. The thermally induced modulation capacity of collagen connective tissue is used to dilate the retinaculum by traction and thus to increase the space below. The present work scrutinizes if UI-KM has an effect on symptoms of CTS and therefore is effective in the treatment of CTS.
Methods
Five subjects with CTS diagnose were recruited. Data was collected before initiation of treatment (T0), one week post- treatment (T1) and 30 days post-treatment (T2), using the “Disabilities of the Arm, Shoulder and Hand” questionnaire (DASH). Additionally a three-time measurement of nerve conduction velocity (NCV) was carried out for each assessment. The subjects were treated 4 times (2 days per week), in a time period of maximum two weeks.
Results
In 5 of 5 subjects (100%) the symptoms (DASH) improved from baseline to T1 and to T2. The median of DASH was 65 (min 56/max 98) at baseline and decreased to 48 (min 46 /max 77) at T1, and changed to 55 (min 45 /max 60) at T2. The changes from T0 to T1 were significant at the level of $p<0,05$, but not from T0 to T2 (Wilcoxon)
In 1 of 5 subjects (20%) the NCV improved from baseline to T1 and in 2 of 5 subjects (40%) from baseline to T2. The median of NCV (in m/s) was 47.3 (min 42.7 /max 61.1) at baseline and decreased to 38.7 (min 34.0 /max 65.7) at T1, and improved to 55.0 (min 42.3 / max 64.7) at T2. All the NCV changes were not significant (Wilcoxon).
Discussion
In contrast to established therapies (different types of surgery) this novel method of treatment does not require harming the body surface. Therefore we suggest that it may be more acceptable for patients. In addition to a significant saving of costs may be achieved. As 5 of 5 subjects improved their symptoms, it can certainly be seen as a tendency, especially for T1 also the Wilcoxon test shows a statistical significance. This finding supports further investigations, which may be larger and better objectified.
Conclusion
This study shows several limitations due to study design. However, the significant decrease of symptoms one week after treatment indicates a positive tendency, which provides convincing evidence for bigger and better objectified investigations.

Some of the main literature sources

Ebenbichler et al. **1998**. Ultrasound treatment for treating the carpal tunnel syndrome: randomised "sham" controlled trial. BMJ, 316**,** 731-5.

Konrad, K. L. 2009. Modulation einer isolierten Schweinesehne mittels ultraschallinduzierter Wärme. Bachelor-Thesis, PHPN Kreuzlingen

Lehmann et al. 1970. Effect of therapeutic temperatures on tendon extensibility. Arch Phys Med Rehabil, 51**,** 481-7.

Robertson et al. 2005. The effect of heat on tissue extensibility: a comparison of deep and superficial heating. Arch Phys Med Rehabil, 86**,** 819-25.

Verdugo e5t al. **2008**. Surgical versus non-surgical treatment for carpal tunnel syndrome. Cochrane Database Syst Rev**,** CD001552.