

## NACHUNTERSUCHUNGSSERGEBNIS BEI DER HPM THERAPIE VON ATHROSEPATIENTEN

**Beobachtungszeitraum:** 6 Monate

**Anzahl der Probanden:** 66

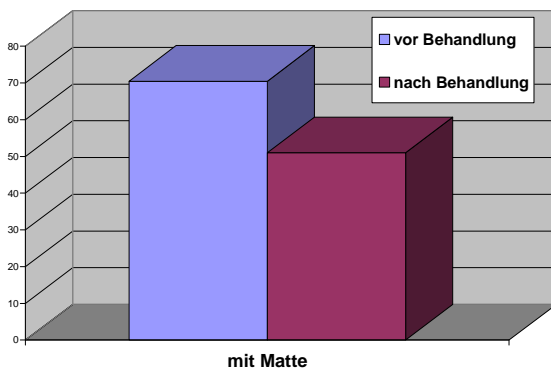
**Aufteilungsschlüssel :** 21 Probanden mit Matte

33 Probanden Kombination Matte mit Direkttherapie Knie

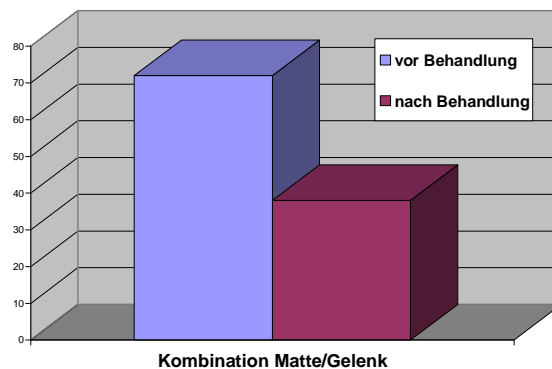
12 Placebo

**Therapiedauer:** min 2 x täglich, 5 Tage in der Woche

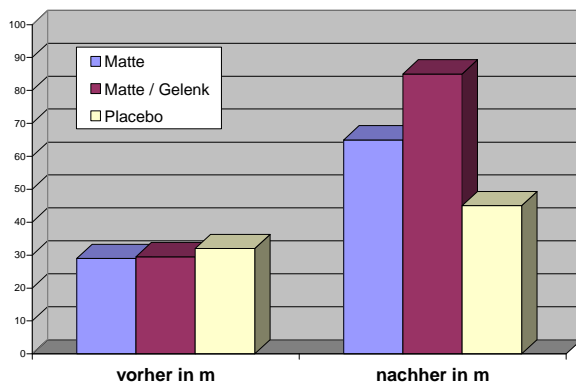
**Arthroseschmerz im Knie**



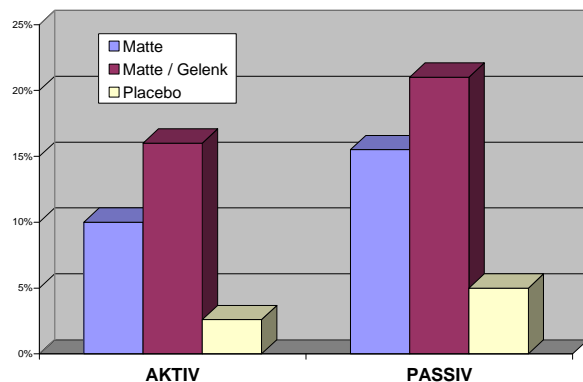
**Arthroseschmerz im Knie**



**Maximale Gehstrecke**



**Aktive/Passive Flexion**



## **ZUSAMMENSTELLUNG VON WISSENSCHAFTLICHE PUBLIKATIONEN ZUR WIRKUNG VON MAGNETFELD THERAPIE BEI OSTEOARTHRITIS**

**1993**

### **A double-blind trial of the clinical effects of pulsed electromagnetic fields in osteoarthritis**

#### **Abstract**

**OBJECTIVE.** Further evaluation of pulsed electromagnetic fields (PEMF), which have been observed to produce numerous biological effects, and have been used to treat delayed union fractures for over a decade.

**METHODS.** In a pilot, double-blind randomized trial, 27 patients with osteoarthritis (OA), primarily of the knee, were treated with PEMF. Treatment consisted of 18 half-hour periods of exposure over about 1 month in a specially designed noncontact, air-coil device. Observations were made on 6 clinical variables at baseline, midpoint of therapy, end of treatment and one month later; 25 patients completed treatment.

**RESULTS.** An average improvement of 23-61% occurred in the clinical variables observed with active treatment, while 2 to 18% improvement was observed in these variables in placebo treated control patients. No toxicity was observed.

**CONCLUSION.** The decreased pain and improved functional performance of treated patients suggests that this configuration of PEMF has potential as an effective method of improving symptoms in patients with OA. This method warrants further clinical investigation.

**1994**

### **The effect of pulsed electromagnetic fields in the treatment of osteoarthritis of the knee and cervical spine. Report of randomized, double blind, placebo controlled trial**

#### **Abstract**

**OBJECTIVE:** We conducted a randomized, double blind clinical trial to determine the effectiveness of pulsed electromagnetic fields (PEMF) in the treatment of osteoarthritis (OA) of the knee and cervical spine.

**METHODS:** A controlled trial of 18 half-hour active or placebo treatments was conducted in 86 patients with OA of the knee and 81 patients with OA of the cervical spine, in which pain was evaluated using a 10 cm visual analog scale, activities of daily living using a series of questions (answered by the patient as never, sometimes, most of the time, or always), pain on passive motion (recorded as none, slight, moderate, or severe), and joint tenderness (recorded using a modified Ritchie scale). Global evaluations of improvement were made by the patient and examining physician. Evaluations were made at baseline, midway, end of treatment, and one month after completion of treatment.

**RESULTS:** Matched pair t tests showed extremely significant changes from baseline for the treated patients in both knee and cervical spine studies at the end of treatment and the one month followup observations, whereas the changes in the placebo patients showed lesser degrees of significance at the end of treatment, and had lost significance for most variables at the one month followup. Means of the treated group of patients with OA of the knee showed greater improvement from baseline values than the placebo group by the end of treatment and at the one month followup observation. Using the 2-tailed t test, at the end of treatment the differences in the means of the 2 groups reached statistical significance for pain, pain on motion, and both the patient overall assessment and the physician global assessment. The means of the treated patients with OA of the cervical spine showed greater improvement from baseline than the placebo group for most variables at the end of treatment and one month followup observations; these differences reached statistical significance at one or more observation points for pain, pain on motion, and tenderness.

**CONCLUSION:** PEMF has therapeutic benefit in painful OA of the knee or cervical spine.

**2002**

**Pulsed magnetic field therapy for osteoarthritis of the knee - a double-blind sham-controlled trial**

**Abstract**

**HINTERGRUND UND METHODE:** Magnetfeldresonanztherapie wird wiederholt zur Behandlung der Arthrose angewendet, obwohl deren Effektivität bisher nicht sicher bewiesen ist. Wir führten deshalb eine randomisierte doppelblinde Vergleichsstudie von Magnetfeldresonanztherapie und einer Scheintherapie an Patienten mit Gonarthrose durch. Die Patienten erhielten 84 Behandlungen zu jeweils 30 Minuten. Die Therapie wurde von den Patienten in Heimanwendung nach vorheriger genauer Instruktion durchgeführt.

**RESULTATE:** Entsprechend einer Fallzahlschätzung wurden 36 Patienten in die Studie eingeschlossen. 34 Patienten beendeten die Studie. Da zwei Patienten die Therapie nicht in ausreichendem Ausmaß durchgeführt hatten, wurden die Daten von 32 Patienten (15 Verum, 17 Placebo) statistisch ausgewertet. Nach sechs Wochen Behandlung nahm der WOMAC Osteoarthritis Index in der Magnetfeldresonanztherapiegruppe von anfänglich 84,1 (+/- 45,1) auf 49,7 (+/- 31,6) ab. In der Placebogruppe kam es zu einer signifikant geringeren Abnahme von 73,7 (+/- 43,3) auf 66,9 (+/- 52,9) ( $p=0,02$ ). Zusätzlich verbesserte sich in der Magnetfeldresonanztherapiegruppe die Ganggeschwindigkeit beim schnellen Gehen (+6,0 Meter/Minute [1,6 bis 10,4] vs. -3,2 [-8,5 bis 2,2]), die Schrittlänge beim schnellen Gehen (+6,9 cm [0,2 bis 13,7] vs. -2,9 [-8,8 bis 2,9]), sowie die Beschleunigungszeit in der Dynamometrie (-7,0% [-15,2 bis 1,3] vs. 7,9% [-3,0 bis 18,9]) im Gruppenvergleich signifikant.

**SCHLUSSFOLGERUNG:** Die Magnetfeldresonanztherapie kann bei symptomatischer Gonarthrose die Beeinträchtigung im täglichen Leben reduzieren und die Kniefunktion verbessern.

2006

## **Adjuvant Treatment of Osteo Arthritis of the Knee with Weak Pulsing Magnetic Fields**

### **Abstract**

**PURPOSE:** The aim of this study was the objective control of the therapeutic effect of weak pulsing magnetic fields (series of periodically repeating square pulses increasing according to an e-function, frequencies of 10, 20, 30, and 200 - 300 Hz) by means of a double-blind study on osteoarthritis of the knee. Measured parameters were the Knee Society score, pain sensation, blood count and cardiocirculatory values.

**METHODS:** 36 placebo and 35 verum test persons (all with a knee gap smaller than 3 mm) were exposed daily for 16 minutes over 6 weeks to a low frequency magnetic field (flux densities increasing gradually from 3.4 up to 13.6  $\mu$ T) encompassing the whole body. The last data collection was made 4 weeks after the end of treatment.

**RESULTS:** Principally, the statistically ensured results exclusively favour the used magnetic field therapy; by far the greatest number of at least significant differences was found at the end of the whole treatment, lasting 6 weeks. In particular, it is striking that all 4 questioned pain scales showed at least significant improvements in favour of the verum collective; also the walking distance was increased. As another confirmed fact, even after 4 weeks without therapy the persistence of several functional and analgesic effects could be documented.

**CONCLUSIONS:** Predominantly, on the one hand, pain relief in osteoarthritis patients was confirmed by a double-blind trial, on the other hand, increases in mobility could be proven. Furthermore, we describe mainly the modes of action of low frequency magnetic energy and 3 physical concepts that are seen as the connecting link between electromagnetic fields coupled into connective tissue and biochemical repair and growth processes in bones and cartilage. Proceeding from the results of this and preceding studies, one has to consider seriously whether this kind of magnetic field application should not be employed as cost-effective and side effect-free alternative or adjuvant form of therapy in the field of orthopaedic disorders.