

## Back Pain

### Neurorehabilitation

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### Evaluation of electromagnetic fields in the treatment of pain in patients with lumbar radiculopathy or the whiplash syndrome

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#### Abstract:

Back pain and the whiplash syndrome are very common diseases involving tremendous costs and extensive medical effort. A quick and effective reduction of symptoms, especially pain, is required. In two prospective randomized studies, patients with either lumbar radiculopathy in the segments L5/S1 or the whiplash syndrome were investigated. Inclusion criteria were as follows: either clinically verified painful lumbar radiculopathy in the segments L5/S1 and a Laségue's sign of 30 degrees (or more), or typical signs of the whiplash syndrome such as painful restriction of rotation and flexion/extension. Exclusion criteria were prolapsed intervertebral discs, systemic neurological diseases, epilepsy, and pregnancy. A total of 100 patients with lumbar radiculopathy and 92 with the whiplash syndrome were selected and entered in the study following a 1:1 ratio. Both groups (magnetic field treatment and controls) received standard medication consisting of diclofenac and tizanidine, while the magnetic field was only applied in group 1, twice a day, for a period of two weeks. In patients suffering from radiculopathy, the average time until pain relief and painless walking was 8.2 - 0.5 days in the magnetic field group, and 11.7 - 0.5 days in controls ( $p < 0.04$ ). In patients with the whiplash syndrome, pain was measured on a ten-point scale. Pain in the head was on average 4.6 before and 2.1 after treatment in those receiving magnetic field treatment, and 4.2/3.5 in controls. Neck pain was on average 6.3/1.9 as opposed to 5.3/4.6, and pain in the shoulder/arm was 2.4/0.8 as opposed to 2.8/2.2 ( $p < 0.03$  for all regions). Hence, magnetic fields appear to have a considerable and statistically significant potential for reducing pain in cases of lumbar radiculopathy and the whiplash syndrome.

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#### References:

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2. V. Grosser, K. Seide and D. Wolter, Berufliche Belastungen und bandscheibenbedingte Erkrankungen der LWS: Derzeit-iger Kausalwissenstand in der Literatur? in: Berufskrankheit 2108: Kausalität und Abgrenzungskriterien, D. Wolter and K. Seide

eds., Springer, Berlin, 1995, pp. 26-38.

Med Pr. 2003;54(6):503-9.

### **[Disorders of locomotor system and effectiveness of physiotherapy in coal miners]**

[Article in Polish]

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**BACKGROUND:** The aim of the survey was to analyze the efficacy of physiotherapy applied in coal miners as well as to assess their locomotor system load and the effects of working conditions in mines. **MATERIALS AND METHODS:** The questionnaire survey covered a group of 51 miners, aged 28-76 years (mean, 54 years), undergoing physiotherapeutic procedures in the mine out-patient clinic during the first quarter of 2003. **RESULTS:** The survey revealed that lumbosacral disorders were the most frequent locomotor system complaints reported by miners, especially those who work in a bending down position. According to the clinical data, spondylosis and allied disorders were the main reasons for pain in this part of the body. Having analyzed the relationship between age and occurrence of back pains, the majority of complaints were found in the 46-55 age group (two complaints per one respondent). The analysis of the association between back pains and duration of employment revealed that the complaints for the locomotor system occurred already after a five-year employment. **CONCLUSIONS:** The survey showed that the application of physiotherapeutic procedures diminished the back pain in the study group by 2.83 on average on the 0-10 scale. It was also found that magnetotherapy proved to be the most effective method in treating the spinal degenerative changes.

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### **Spine fusion for discogenic low back pain: outcomes in patients treated with or without pulsed electromagnetic field stimulation.**

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Sixty-one randomly selected patients who underwent lumbar fusion surgeries for discogenic low back pain between 1987 and 1994 were retrospectively studied. All patients had failed to respond to preoperative conservative treatments. Forty-two patients

received adjunctive therapy with pulsed electromagnetic field (PEMF) stimulation, and 19 patients received no electrical stimulation of any kind. Average follow-up time was 15.6 months postoperatively. Fusion succeeded in 97.6% of the PEMF group and in 52.6% of the unstimulated group ( $P < .001$ ). The observed agreement between clinical and radiographic outcome was 75%. The use of PEMF stimulation enhances bony bridging in lumbar spinal fusions. Successful fusion underlies a good clinical outcome in patients with discogenic low back pain.

Bratisl Lek Listy. 1999 Dec;100(12):678-81.

### **[Personal experience in the use of magnetotherapy in diseases of the musculoskeletal system]**

[Article in Slovak]

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Therapeutic application of pulsatile electromagnetic field in disorders of motility is recently becoming more frequent. Despite this fact information about the effectiveness of this therapy in the literature are rare. The aim of this study was therefore the treatment of 576 patients who suffered from vertebral syndrome, gonarthrosis and coxarthrosis. For application of pulsatile electromagnetic field MTU 500H Therapy System was used. Pulsatile electromagnetic field had a frequency value of 4.5 mT in all studied groups and magnetic induction value 12.5-18.75 mT in the 1st group. In the 2nd group the intensity was 5.8-7.3 mT and in the 3rd group it was 7.6-11.4 mT. The time of inclination/declination in the 1st group was 20/60 ms, in the 2nd group 40/80 ms and in the 3rd group 40/90 ms. The electromagnetic field was applied during 10 days. In the 1st-3rd day during 20 minutes and in the 4th-10th day during 30 minutes. The therapy was repeated in every patient after 3 months with values of intensity higher by 50%. In the time of pulsatile electro-magnetotherapy the patients were without pharmacotherapy or other physiotherapy. The application of pulsatile electromagnetic field is a very effective therapy of vertebral syndrome, gonarthrosis and coxarthrosis. The results have shown that the therapy was more effective in patients suffering from gonarthrosis, than in patients with vertebral syndrome and least effective in patients with coxarthrosis. Owing to regression of oedema and pain relieve the motility of patients improved. (Tab. 3, Ref. 19.)

Minerva Anesthesiol. 1989 Jul-Aug;55(7-8):295-9.

### **[Pulsed magnetic fields. Observations in 353 patients suffering from chronic pain]**

[Article in Italian]

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Three hundred-fifty-three patients with chronic pain have been treated with pulsed electromagnetic fields. In this work the Authors show the result obtained in the unsteady follow-up (2-60 months). The eventual progressive reduction of benefits is valued by Spearman's test. We noted the better results in the group of patients with post-herpetic pain (deafferentation) and in patients simultaneously suffering from neck and low back pain.