

MEDICAL RESEARCH

AIDS

Cossarizza et al.: 'Effects of PEMF on the Proliferation of Lymphocytes from AIDS-Patients, HIV Sero- Positive Subjects, and Seronegative Drug Users,' Department of Disease, University of Modena, Italy, J. Bio-electrics (USA) 1989. - The effect of PEMF on the replication of mitogen-stimulated lymphocytes in AIDS patients and a controlled group was investigated. It was found that cell division remained unchanged in the group of healthy subjects. In the AIDS patient group, an increase in active T lymphocytes was observed.

Wallach: 'Electromagnetic Therapy - A New Medical Discipline,' California Institutional Review Board, Canoga Park, California, 1998. - This article reviews various documented by studies, in addition to the traditional indications involving the motor system, mainly new possibilities such as supportive treatment by PEMF in the area of immunology and AIDS.

M.R. Cho et al.: 'Regulation of Electric Field-Induced Macrophage Migration by Extra cellular Matrix,' Harvard Medical School and Brigham & Women's Hospital, Boston. University of Chicago School of Medicine, Chicago. 1998. - This study has shown that phagocytes are stimulated by PEMF to much greater activity than was the case in the control group without PEMF
Rodin et al.: 'Use of Low-Intensity Eddy Magnetic Field in the treatment of Patients with Skin Lymphomas', Voen Med Zh, 317 (12), 1996, pp. 32-34

Acne

R.A. Drolet: 'Thumart Therapy: A non-Invasive Cell Regeneration Ion and Anti-Inflammatory Therapy Using Electromagnetic Fields,' Bioelectromagnetics Society, 4th Annual Meeting, Los Angeles. - The positive anti-inflammatory, cell-regenerating, sedative and pain-relieving effects of PEMF are described.

Allergies

V.I. Kovalchuk, et al., 'Use of Extremely Low Frequency Magnetic Fields in Clinical Practice,' Fizicheskaia Medtizona, 4 (1-2), 1994, p. 87. - The anti-inflammatory and pain-relieving effects of PEMF are emphasized.

Alzheimer's Disease

Complications were registered and tumor relapse rates were relatively low. The effect was likely to be due to antistressor influence of MF. The procedure may substitute drug therapy for immunocorrection and to elderly patients by resetting the biological clock.

R. Sandyk: 'Alzheimer's Disease: Improvement of Visual Memory and Visuoconstructive Performance by Treatment with low intensity PEMF in Picotesla intensity ' International Journal of Neuroscience, 76 (3-4), June 1994, pp. 185ff. - Two Alzheimer's patients showed a definite improvement after treatment with PEMF, especially in the visual memory and their drawing abilities. There were also improvements in other cognitive functions, in the ability of these patients to orient themselves in space, their mental/emotional condition, their ability to make social contact and their short-term memory.

Apoplexy

G. Grantet et al.: "Protection Against Focal Cerebral Ischemia Following Exposure to a Pulsed Electromagnetic Field," Department of Neurosurgery, Stanford University, California, Bioelectromagnetics 1994. - This study shows that electromagnetic stimulation leads to more rapid healing and repair of damage to cerebral arteries. Studies on rats have shown a positive effect of pulsating electromagnetic fields in the treatment of strokes.

F.E. Gorbunov et al.: "The Effect of Combined Trans-cerebral Magnetic and PEMF on the Cerebral and Central Hemodynamic Status of Stroke Patients in the Early Rehabilitation Period," Vopr Kurortol Fizioter Lech Fiz Kult (3), May-June 1996, pp. 21-24. - These study results prove that treatment of apoplexy patients with PEMF in combination with a stimulus current in the early phase of rehabilitation yields the best results.

B. Baychev et al.: "Evaluating the Effect of PEMF on Vasculo-Vegetative and Motor Disorders in Stroke Patients," Kurortol-Fizioter. 27/3 1990. - Thirty-five stroke patients were examined on the basis of various clinical test methods. After 15 days of treatment with PEMF an improved blood supply in both halves of the brain and a clinical improvement especially in the area of the hemiplegia were found. Motor abilities were restored more rapidly and the tendency to spastic symptoms was definitely reduced. PEMF was tolerated very well by the patients and proved to be quite beneficial both in the acute and subacute phases after a stroke.

R. Cadossi: "Protective Effect of Electro-magnetic Field Exposure on Acute Soft Tissue Ischemic Injury," Second World Congress for Electricity and Magnetism in Biology and Medicine, June 8-13, 1997, Bologna, Italy. - Pulsating electromagnetic fields develop a protective mechanism against necrosis in acute ischemia. This experiment was proven on the brains of rats.

Arthrosis

T. Zizic et al.: "The treatment of rheumatoid arthritis of the hand with pulsed electromagnetic fields," World Congress for Electricity and Magnetism in Biology and Medicine, June 1997, Bologna, Italy. - This double blind, placebo-controlled study investigates the effects of pulsating fields for a period of four weeks in the treatment of

arthritis of the hand. The results show a definite clinical improvement in patients receiving magnetic field therapy in comparison with the control group without PEMF.

V.D. Grigor'eva et al.: "Therapeutic use of physical factors in complex therapy of patients with psoriatic arthritis," *Vopr Kurortol Fizioter Lech Fiz Kult* (6), 1995, pp. 48-51. - This study presents a review of the treatment of patients with psoriatic arthritis with low-frequency pulsed electromagnetic fields. It demonstrates a definite improvement in the clinical condition of the effected joints.

D.H. Trock et al.: "A double blind Trial of the Clinical Effects of PEMF in Osteoarthritis," *Journal of Rheumatology*, 1993:20, pp. 456-460. - This double blind randomized study with 27 patients (primary arthrosis of the knee) is one of the most important research studies conducted in the field of PEMF.

Six clinical parameters were investigated at different times during the treatment and an evaluation was carried out after one month. These results show a definite improvement in clinical parameters (such as mobility) in the group treated with PEMF in comparison with the group treated without PEMF. An important conclusion in this study is that for more than 17 years, more than 200,000 patients have already been treated in Eastern Europe with pulsating electromagnetic fields in clinical trials without any mentionable side effects. Observations in Eastern Europe on 861 patients with painful rheumatic changes have shown an improvement in symptoms in 70-80%. F. Pezzetti et al.: "Effect of Pulsed Electromagnetic Field Exposure of Human Chondrocytes in Vitro," University of Ferrara, Italy, November 1998. - This study investigated the influence of pulsating electromagnetic fields on cartilage cells and demonstrated a definite increase in cartilage reconstruction under the influence of PEMF.

H. Lieu et al.: "PEMF Influences Hyaline Cartilage Extracellular Matrix Composition without Affecting Molecular structure," *Osteoarthritis and Cartilage* 4, 1996, pp. 63-76. - This study represents an important step in scientific research into the positive effects of magnetic fields on arthrosis. It shows that PEMF influences cartilage metabolism and can prevent the degradation of glucosamine glycans. In some individual cases, cartilage mass has been regenerated. L. Yarkiv et al.: "The use of Changeable Magnetic Field in Treatment of Osteoarthritis," *European Bioelectromagnetics Association, 3rd International Congress*, February 29 - March 3, 1996, Nancy, France. - This controlled study on arthrosis patients has shown a definite improvement in the disease condition of patients treated with PEMF.

D.H. Trock et al.: "The Effect of PEMF in the Treatment of Osteoarthritis of the Knee and Cervical Spine. Report of Randomised, Double blind, Placebo-controlled Trials," *Journal of Rheumatology*, 1994:21, pp. 1903-1911. - This study on 86 patients with arthrosis in the knee and 81 patients with arthrosis in Magnetic fields appear to have a considerable and statistically significant potential for reducing pain in cases of lumbar radiculopathy and the whiplash syndrome. - Neuro Rehabilitation.

Back pain – low back

This randomized, double-blind, placebo-controlled clinical trial studied the effectiveness of pulsed electromagnetic therapy (PEMT) in patients with chronic lower back pain. PEMT

produced significant pain reduction throughout the observation period compared with baseline values. The percentage change in the NRS score from baseline was significantly greater in the PEMT group than the placebo group at all three time-points measured. The mean revised Oswestry disability percentage after 4 weeks was significantly improved from the baseline value in the PEMT group, whereas there were no significant differences in the placebo group. In conclusion, PEMT reduced pain and disability and appears to be a potentially useful therapeutic tool for the conservative management of chronic lower back pain. - Journal of International Research We evaluate the efficacy and safety of therapeutic electromagnetic fields (TEMF) on chronic low back pain. Secondary objectives included the investigation of the effects of TEMF on psychometric measures. Both groups improved over time. Although groups were similar during the treatment period, treated subjects (TEMF of 15 mT) improved significantly over sham treatment during the 2-week follow-up period (20.5% reduction in pain); There were no reported serious adverse events. This study demonstrates that TEMF may be an effective and safe modality for the treatment of chronic low back pain disorders. - Pain Practice.

Rotator cuff tendonitis

The value of pulsed electromagnetic fields (PEMF) for the treatment of persistent rotator cuff tendonitis was tested in a double-blind controlled study in 29 patients whose symptoms were refractory to steroid injection and other conventional conservative measures. At the end of the study 19 (65%) of the 29 patients were symptom-less and 5 others much improved. PEMF therapy may thus be useful in the treatment of severe and persistent rotator cuff and possibly other chronic tendon lesions. - The Lancet.

Cancer – cells

PEMF controls cell growth depending on the degree of cell differentiation. This study also shows the potentiality of PEMF as an adjunctive treatment method for malignant tumors. - Bioelectromagnetics.

No adverse side-effects were reported in an investigation of the antitumor effect of turbulent magnetic field (TMF) carried out as a component of preoperative chemoradiotherapy for breast cancer at the Center's Clinic. The study group included 114 patients with locally advanced tumors(T3, N1-N3, M0).

Cancer – bladder The study deals with immune status of patients operated for bladder cancer and exposed postoperatively to alternating magnetic field (MF). MF application was followed by higher T- and B-lymphocyte and CD4+, CD16+ cell levels as well as enhanced T-cell activity; no postoperative.

Cancer – breast tumorsThe study was concerned with effect of alternating magnetic field (AMF) on immunobiological characteristics of lymphocytes from patients with locally advanced breast tumors.

Amyotrophic Lateral Sclerosis

R. Bellosei, Berget: 'Pulsating Electromagnetic Fields offer a Glimmer of Hope for Patients Suffering from Amyotrophic Lateral Sclerosis,' Second World Congress for Electricity and Magnetism in Biology and Medicine, June 8-13, 1997, Bologna, Italy. - This investigation reports on three patients with amyotrophic.

lateral sclerosis who responded positively to with PEMF. Definite clinical improvements were observed in these patients.

Parkinson Disease

Parkinson's disease Since brief, extracerebral applications of pico-tesla (pT) range flux intensity electromagnetic fields (EMFs) of low frequency have been shown to produce rapid improvement in motor and cognitive symptoms in PD, it is expected that application these EMFs would lead also to an increase in the amplitude of visual evoked potential (VEP) response. The study demonstrates that in Parkinsonian patients extracerebral application of these EMFs rapidly increases in amplitude of the VEP response and, by inference, cerebral dopamine levels presumably by increasing dopamine release. - International Journal of Neuroscience.

Anaemia

T.V Golovacheva: PEMF in Complex Treatment of Cardiovascular Diseases, "mm Waves in Medicine and Biology", 10th Russian Symposium with International Participation, April 24-26, 1995, Moscow, pp. 29-31.

Aneurysm

V.M. Bogoliubov, L.A. Skurikhina: "Therapeutic Application of Constant and Low-frequency Electromagnetic Fields," - this review of various studies documented positive effects in the treatment of arterial aneurisms.

Angina Pectoris

L.L. Orlov et al.: "Evaluation of Anti-anginal Effects of PEMF and Drug Therapy on the Physical Working Capacity and Hemodynamic in Patients with Stable Angina Pectoris," Cardiology, February 1992. - In L.N. Budkar et al.: 'Manetolaser Therapy in Treatment of Ischemic Heart Disease and Heart Rhythm.

Disorders,' Doktor Lending, 4(3), 1996, pp. 10-13.

E.M. Vasi?eva et al.: 'The Effect of Low-Frequency Magnetic Field on Erythrocyte Membrane Function and on the Prostanoid Level in the Blood Plasma of Children with Parasystolic Arrhythmia,' vopr Kurortol Fizioter Lech Fiz Kult (2), March-April 1994, pp. 18-20. - This study reports on the results obtained on 23 children with parasystolic arrhythmia who

experienced an improvement with PEMF in both humoral and cellular processes which are involved in the regulation of the heart rhythm.

L.D. Makoeva et al., "PEMF in Treating Stenocardia," *Biofizika* July-August, 1996, pp. 949-952. – This article reports on the use of PEMF in treatment of angina pectoris in combination with and without medication. The flow properties of the blood, the cardiac output and clinical symptoms were investigated.

It was found that PEMF has a definite anti-anginal action on class 1 and 2 angina patients. With the combination with several drugs on class 3 angina patients, a stronger and better effect of the medications was observed. The incidence of heart attacks was clearly reduced.

Arteriosclerosis

C. Wallach: "Electromagnetic Therapy. A New Medical Discipline," California Institutional Review Board, Canoga Park, California, 1998. – This author shows that new areas of use for PEMF are opening up and more and more biological effects are being studied and documented by scientists. In addition to the known broad spectrum in injuries current studies on arteriosclerosis patients are showing a positive effect on atherosclerotic plaques.

R.T. Gor et al.: "Selective Resolution of Plaques and Treatment of Arteriosclerosis Biophysical Alteration of Cellular and Intracellular Properties," *Medical Hypotheses*, 7(2) February 1981, p. 217. – In this article the new possibility of treatment arteriosclerosis by PEMF is discussed. Some of the atherosclerotic plaques that have already formed can be dissolved again without injuring the vessels.

Arrhythmia

R. Sandyk et al.: 'Age-Related Disruption of Circadian Rhythms: Possible Relationship to Memory Impairment and Implications for Therapy with Magnetic Fields,' *International Journal of Neuroscience*, 59 (4), August 1991, pp. 259-262. – The circadian rhythm seems to be causally related to memory loss in the elderly and possibly also to Alzheimer's disease. PEMF can probably improve memory performance in this study the effect of PEMF and medication against angina pectoris and the combination therefore was investigated on 60 patients with stable first through third degree angina. A monotherapy (just one medication) with MDT had a good anti-angina action on patients with class 1-2 angina pectoris. The efficacy of the treatment increased definitely when combined with several drugs.

F. Petrossi: 'The Effect of Low-Frequency Magnetic Field on Erythrocyte Membrane Function and on the Prostanoid Level in the Blood Plasma of Children with Parasytolic Arrhythmia,'

T.A. Kniazeva, R. Artutiunian: "The Effect of PEMF and General Iodobromide Baths with the Presence of Molecular Iodine on the Blood Coagulation Processes and the Central

Hemodynamic of Patients after an Aortocoronary Bypass,” Zeitschrift für Kur- und Physiotherapie [Journal for Cure Therapy and Physical Therapy], 1990.

Arthritis

Jacobson JI, Gorman R, Yamanashi WS, Saxena BB, Clayton L. Institute of Theoretical Physics and Advanced Studies for Biophysical Research, Perspectivism Foundation, 2006 Mainsail Cir, Jupiter, USA.

Placebo-controlled, randomized, double blind clinical study to determine the effectiveness of low-amplitude, extremely low frequency magnetic fields on patients with knee pain due to osteoarthritis.

176 patients were randomly assigned to 1 of 2 groups, the placebo group (magnet off) or the active group (magnet on). INTERVENTION: 6-minute exposure to each magnetic field signal using 8 exposure sessions for each treatment session, the number of treatment sessions totaling 8 during a 2-week period, yielded patients being exposed to uniform magnetic fields for 48 minutes per treatment session 8 times in 2 weeks. The range of magnetic field amplitudes used was from 2.74×10^{-7} to 3.4×10^{-8} G, with corresponding frequencies of 7.7 to 0.976 Hz. RESULTS: Reduction in pain after a treatment session was significantly ($P < .001$) greater in the magnet-on group (46%) compared to the magnet-off group (8%). CONCLUSION: Low-amplitude, extremely low frequency magnetic fields are safe and effective for treating patients with chronic knee pain due to osteoarthritis. PMID: 11565402 PubMed E. Riva Sanseverino, A. Vannini, P. Castellacci: “Therapeutic effects of pulsed electromagnetic fields on joint diseases,” Panminerva Medica 34(4), October-December 1992, pp. 187-196. – This study characterizes PEMF as an excellent physical measure for the treatment of joint diseases. The authors of the cervical spine has shown a definite difference between the PEMF group and the control group. The patients treated with PEMF show an improvement with a statistically significant difference in almost all clinical parameters.

The Herder Clinic in Bremen reports of four years of experience with PEMF in diseases and injuries of the supporting system and the motor system – An evaluation of 650 cases of arthrosis of the spinal column and peripheral joints found a reduction in pain in 60-70% of the cases.

Artificial Joints

K. Konrad et al.: “Therapy with PEMF in Aseptic Loosening of Total Hip Prostheses: A Prospective Study,” Budapest, Hungary, Clin. Rheumatol., July 1996. – PEMF was used on 24 patients with a loosened hip prosthesis. Follow-up examinations were performed after six months and after one year, showing that the patients treated with PEMF had experienced pain relief and a definite improvement in hip movements. The isotope scan and ultrasonic tests confirmed these positive results. W.F. Kennedy et al.: “Use of PEMF in Treatment of Loosened Hip Prostheses. A Double blind Study,” Clin Orthop., January 1993 (286), pp. 198-205. – This

study with 37 patients with cemented hip prostheses demonstrates that 53% of the loosened hip prostheses had fused again after six months of PEMF, whereas only 11% in the control group had a similarly positive effect. Studies are currently carried out at three renowned German University Clinics. The studies were initiated after extremely positive preliminary. G. Gualtieri et al.: "The Effect of PEMF Stimulation on Patients Treated of Hip Revisions with Trans- femoral Approach," Second world Congress for Electricity and Magnetism in Biology and Medicine, June 8-13, 1997, Bologna, Italy. – This double blind study investigated the effect of PEMF on patients with loosened hip prostheses. The results demonstrate an increase in bone density with a stabilising effect on the prostheses in all patients treated with PEMF, whereas only about half those in the control group showed an increase in bone density.

Ankle sprain

Acutely sprained ankles represent a frequent and common injury among active duty troops in training, and are a significant source of morbidity with respect to days lost to training. In a randomized, prospective, double blind study of 50 grade I and II (no gross instability) sprained ankles, a statistically significant decrease in edema was noted following one treatment with pulsed electro magnetic field (PEMF) therapy. The application of this modality in acutely sprained ankles could result in significant decreases in time lost to military training. – Military Medicine.

Back Pain

” D. Foley-Nolan et al.: "Low Energy High Frequency Therapy for Persistent Neck Pain. Double blind Placebo-controlled Trial," Bioelectromagnetics Society, 12th Annual, June 10-14, 1990, San Antonio, p. 73. – In this double blind, placebo-controlled study, the effects of low-energy pulsating electromagnetic electric fields on persistent back pain were investigated. Clearly positive results were demonstrated.

Back pain and the whiplash syndrome are very common conditions involving tremendous costs and extensive medical effort. A quick and effective reduction of symptoms, especially pain, is required.

Diabetic neuropathy/angipathy

Significant improvement of symptoms, and of all registered parameters of peripheral circulation was established after the therapy. High-frequency pulsating electromagnetic field is recommended for the treatment of diabetic angiopathy. In patients with neuropathic changes it can be used as an introduction procedure. – Srpski arhiv za celokupno lekarstvo.

This study demonstrates that pulsed electromagnetic fields are able to accelerate wound healing under diabetic and normal conditions by up-regulation of FGF-2-mediated

angiogenesis. They also prevented tissue necrosis in response to a standardized ischemic insult, suggesting that noninvasive angiogenic stimulation by pulsed electromagnetic fields may be useful to prevent ulcer formation, necrosis, and amputation in diabetic patients. – Plastic and Reconstructive Surgery.

Erectile dysfunction Combined treatment with local negative pressure and pulsating magnetic field conducted in 116 patients with erectile dysfunction aged 20-60 years produced optimal treatment results.

Recovery and improvement of the erectile function were achieved in 85.7% patients given local vacuum magneto-therapy. – Vopr Kurortol Fizioter Lech Fiz Kult.

An effect was studied of appliances for magneto-therapy on sexual function of 105 men presenting with sexual problems. A total of 96 sexological patients were examined according to a general program, to study placebo-effect. The magnetic field beneficial effect was recordable in 70-80 % of the patients, that of placebo in 33 % men. It is suggested that augmentation of sexual activity is associated with an increase in cavernous blood flow. – Lik Sprava

<http://pemfcamati.com/medical-research.html>

Evaluation of the effects of Extremely Low Frequency (ELF) Pulsed Electromagnetic Fields (PEMF) on survival of the bacterium Staphylococcus aureus

Background This study investigated the effects of extremely low frequency (ELF) pulsed electromagnetic field (PEMF) radiation on the growth of bacterium Staphylococcus aureus (ATCC 25923) that plays a versatile role in infecting wounded tissues. The viability of these bacteria (number of live cells as colony-forming units (CFUs)) was measured before and after the ELF PEMF exposures to quantify their survival rate. Methods S. aureus cultures were first

Article

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Istiaque Ahmed



Taghrid S Istivan



Irena Cosic



Elena Pirogova

... There is ongoing interest in applications of pulsed electromagnetic field (PEMF) radiation as an alternative therapy for different medical conditions [1]. Studies have demonstrated that extremely low frequency (ELF) PEMF radiation facilitates the process of wound repair [2,3]. ELF PEMF is a sub-class of electromagnetic field (EMF) that displays frequencies at the lower end of the electromagnetic spectrum [1], from 6 Hz up to 500 Hz. ...

... For example, radiation at 500Hz (upper limit of the ELF spectrum) would produce an energy equivalent to $2.068e - 12$ eV. ELF magnetic field therapy is considered as useful and beneficial treatment for different diseases, especially those involving skin and bones [3413]. Almost all diseases are the result of impaired cellular function. ...

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[8589917 The Effect of Short High Intensity Magnetic Field Pulses on the Healing of Skin Wounds in Rats](https://www.researchgate.net/publication/8589917)