

MADU METHOD IN HEALING OF SPINAL OSTEOARTHRITIS SYNDROME

Drago Djordjevic

University of Belgrade
Medical Faculty
Institute for Pathological Physiology
Dr Subotica 9, 11000 Belgrade, Serbia
dragodj@eunet.yu

Dusanka Mandic

Specialised Practice "MADU"
Visokog Stevana 2/I, 11000 Belgrade, Serbia
mandicd@eunet.yu

ABSTRACT

Magnetotherapy with static magnetic fields presents the science of this fascinating subject, explaining why magnets increase oxygenation in the blood, lower cholesterol and blood pressure, reduce pain, enhance cellular and tissue regeneration.

The aim of this study is to show the new methods of application of the static magnetic fields for treating symptoms and signs of spinal osteoarthritis syndrome and weigh the benefits of special of north (N) pole oriented magnetic strips and magnetophores, in the contrast to traditional bipolar magnets.

We used static magnetic fields as a noninvasive method of the therapeutic application with magnetic deep unipolar [MADU- north (N) oriented] strips, as well as N oriented magnetophores, for treatment patients (103 males and females) with spinal osteoarthritis syndrome. Static magnets by their N pole faced were applied towards the skin with a power 10 to 15 times weaker than the tested and approved levels prescribe by the World Health Organization (WHO). The MADU strips applied on the reflexogenic zones, and magnetophores on the reflexogenic (acupuncture) points, retained contact with the body for a period ranging from three weeks to four years.

Followed period was from few months to four years. We examined 103 patients with spinal osteoarthritis syndrome follow-up according to radiological findings of regeneration which had been found in 68 (66,02%) of the controlled patients; them 23 (22,33%) remained the same status, and 12 (11,65%) of patients were with disease progressed.

Static magnetic fields was applied for extended periods of time in the form of magnetic strips (MADU) and (N) magnetophores, made a possible regenerative processes of the bone, bone cartilage and soft tissues in patients with spinal osteoarthritis syndrome, as a result of their influence on neural, vascular, enzymatic and metabolic processes in a joints. Special benefit is rehidratation of cartilage molecules with linked magnetized water. In that way spinal joint's function is increased.

1 INTRODUCTION

The static magnetic fields of small power have therapeutic effects at many animal's and human's tissues and organs. Numerous scientific studies show that many cases of stiff shoulders, back, or neck, unexplained chest pain and frequent headaches, migraine, as well as insomnia and general fatigue are actually caused by as it is known as Magnetic Deficiency Syndrome [1], double-blind tests reveal that magnets have brought rapid relief in 90 % of these cases [2].

The recent discovery of magnetic receptors in the human brain has confirmed what the ancient Chinese, Indies, Egypts, and Greeks always knew: that human beings are strongly influenced by the Earth's magnetic field, and that by subtly altering our own energy fields with magnets we can restore proper balance in our body systems.

Magnetotherapy is gentle and effective way to balance body systems [2]. The science of magnetotherapy has already been successfully used by more than one billion people in the many countries all over the world.

Clinical studies show magnetotherapy as an effective treatment for back pain, osteoarthritis syndrome (OAS), osteoporosis, insomnia, migraine, high cholesterol and blood pressure, and many other disorders.

Osteoarthritis syndrome is a common, age-related disorder of synovial joints. Osteoarthritis syndrome, formerly called *degenerative joint disease*, is the most prevalent form of arthritis and a leading cause of disability and pain in the elderly. It is characterized by local areas of loss and damage of articular cartilage, new bone formation of joint margins (osteophytosis), subchondral bone changes, variable degrees of mild synovitis and thickening of the joint capsule.

Osteoarthritis is more of a disease process than a specific entity. The term encompasses a heterogeneous collection of syndromes, including OAS of the hand, knee, hip, foot, and spine. It can occur as a primary idiopathic disorder or a secondary disorder, although this distinction is not always clear. Idiopathic or primary variants of OAS occur as localized or generalized (i.e., involvement of more than three joints) syndromes. Secondary OAS has a known underlying cause such as congenital or acquired defects of joint structures, trauma, metabolic disorders, or inflammatory diseases.

Osteoarthritis syndrome of the spine relates strictly to changes in synovial-lined joints (apophyseal and uncovertebral joints) that can lead to localized pain as well as irritation of adjacent nerve roots with referred pain in the form of radiculopathy. Nerve root compression resulting from apophyseal joint subluxation, prolapse of an intervertebral disc, or osteophytic spurring may occur, and the patient may present with muscle weakness, hyporeflexia, and paresthesia or hypesthesia. In cervical region, spinal involvement can lead to cord impingement with long tract signs, or it may affect the vertebral artery, producing insufficiency of the posterior circulation with associated symptoms.

Osteoarthritis syndrome of the spine should be differentiated from diffuse skeletal hyperostosis, in which there is marked calcification of the paraspinal ligaments and sparing of the arthroal spinal joints.

2 PURPOSE

This study's aim was to investigate the magnetic field's influence on the OAS using new clinical procedures. The purpose of this study is to show the new methods of application of the static magnetic fields for treating symptoms and signs of OAS and weigh the benefits of north (N) pole oriented magnetic strips (MADU) and magnetophores, in the contrary to the traditional bipolar magnets used until now.

3 METHOD

Outpatients with OAS were treated by medical doctors and specialists consultants. Present the new possibilities of treatment with MADU (ICD-10, M45-M54).

Static magnetic fields as a noninvasive method was used as the therapeutic application with magnetic deep unipolar (MADU) or north (N) oriented strips, as well as N oriented magnetophores, for treatment at 103 patients with spinal OAS. The MADU strip is a new non-invasive solution, patented by M.D. Ph.D. Dusanka Mandic to the World Intellectual Property Organization (WIPO) No. PCT/YU 98/00018, WO 99/60581 and researched as a Novelty (N), Inventive Step (IS) and Industrial Applicability (IA) and proved new medical

technology of healing (No. 022-04-19/2006-07; Decision of The Ministry of Health Republic of Serbia).

The power of the magnetic fields was measured by a magnetometer [Gaussmeter RFL, Zurich, Switzerland (precision: 10 Gauss to 10 kiloGauss)], while the reactive distance and the depth of their recommended influence was measured by a proton magnetometer {Portable Proton Magnetometer Model G-856A, EG&G, Geometrics, USA [precision: 50 nanoTesla (nT)]}. One or more magnets, in the form of a strip, were placed on the surface of the body known as reflexogenic zones (RZ), and magnetophores on the smaller areas or reflexogenic (acupuncture) points (RP), with the N faced pole or negative (-) pole turned towards the skin. The strips and magnetophores were applied towards the skin with a power 10 to 15 times weaker than the tested and approved levels prescribe by the World Health Organization (WHO). There magnets were adhered by means of plaster, bandage or pieces of cloth, and retained contact with the body for a period ranging from three weeks to four years.

Magnetic Deep Unipolar Oriented Field applied as MADU strips with guaranteed optimal magnetic field induction lasting for 10 years, providing long lasting protective activity in the area of the local disorder of diseased tissue, including blood vessels and poor tissue nutrition, or on the RZ and RP. The MADU strip is a technically-patented, new, non-invasive solution for prevention and therapy evaluated and approved by the WIPO.

The MADU strips applied on the reflexogenic zones (RZ), and magnetophores on the reflexogenic (acupuncture) points (RP), retained contact with the body for a period ranging from three weeks to four years.

4 RESULTS

Treating patients with OAS at different locations of the body by applying of MADU methods showed us successfully resultates in the treatment of pain syndromes, osteoporosis, and similar diseases of different genesis.

It was demonstrated that static magnetic fields have inhibitory effect on process OAS and osteoporosis. Used techniques were very effective in pain control, including a special improvement of general status and patientes working capability. Analgetic effects of this magnetotherapy possess complex action mechanisms. Regenerative processes were so successful that, besides qualitative renewal of the structure of the bone tissue, it has leded the formation of new joint space, which had created a better and more efficious function of the joint, with a better quality of human life.

No statistical significance was obtained comparing the efficacy of magnetotherapy between patients with different OAS of spine.

MADU methods (unipolar static magnetic field) have effects at degradation of collagen and proteoglycans in OAS is carried out by proteolytic enzymes [matrix metalloproteinases (MMPs)] that are synthesized by and released from the chondrocytes themselves. Articular cartilage is probably lost through enzymatic breakdown of cartilage matrix: the proteoglycans, glycosaminoglycans, and collagen.

Enzymatic destruction of cartilage begins in the matrix, with destruction of proteoglycans and collagen fibers. Influence of enzymes, particularly stromelysin and acid metalloproteinase, decrease affect proteoglycans by interfering with assembly of the proteoglycan subunit or the proteoglycan aggregate, which are markedly elevated in OAS. Changes are inhibited in the conformation of proteoglycans disrupt the pumping action that regulates movement of water and synovial fluid into and out of the cartilage. Without the regulation action of the proteoglycan pump, cartilage imbibes too much fluid and becomes less able to withstand the stresses of weight bearing. Also with aging, the proteoglycan content is decreased and water content in cartilage can be increased by as much as 8%,

affecting the strength of the cartilage [3]. Persons with OAS, even those with fairly extensive cartilage destruction, have elevated levels of proteoglycans or fragments of proteoglycans in their synovial fluid, perhaps indicative of a more pronounced reparative phase.

Inflammatory cytokines, such as interleukin-1 (IL-1), play a major role in cartilage degradation in part through induction of nitric oxide synthase (iNOS) and nitric oxide (NO) increased generation [3]. A number of cytokines and other mediators of inflammation, including tumor necrosis factor alpha (TNF- α), IL-6, IL-8, NO, and prostaglandins, can be produced by chondrocyte and act within the cartilage to promote a catabolic state by activating MMPs [4]. Cytokines release and activate proteolytic and collagenolytic enzymes causing an imbalance of cell responses to growth factor activity [3].

MADU methods by applying static magnetic field have influence to inhibitory effects of proinflammatory cytokines, primary IL-1, TNF and IL-6, in the way of changing function of synthesis and secretion cells (chondrocytes and leukocytes) [2]. Chondrocyte apoptosis is increased in OAS cartilage and is directly correlated with hydroxyapatite crystal deposition, and NO is major stimulator of apoptosis in chondrocytes [5,6].

Inflammatory mediators that promote degradation of the cartilage matrix possibly are an important factor for calcification. Deficient expression of inhibitors of calcification [e.g., pyrophosphate (PPi)], as well as procalcifying mediators [e.g., inorganic phosphate (Pi)] may trigger the calcification process [7]. Collagen breakdown destroys the fibrils that give articular cartilage its tensile strength and exposes the chondrocytes to mechanical stress and enzyme attack. Thus a cycle of destruction begins that involves all the components of articular cartilage: proteoglycans, collagen fibers, and chondrocytes.

Increasing destruction is stopped by applying unipolar static magnetic field which has antiinflammatory influence. Due to more often present gap junction channels in RZ and RP, we are able to activate ancient, forgotten informative centers in organism, which are responsible for accepting and sending magnetic/electromagnetic informations.

Conservative treatment includes rest of the involved joint until inflammation, if present, subsides; range-of-motion exercise to prevent joint capsule contraction; use of a cane, crutches, or walker to decrease weight bearing; weight loss if obesity is present; and analgesic and antiinflammatory drug therapy to reduce swelling and pain. Muscle-strengthening exercises may help protect the joint and decrease pain [8].

Glucosamine and chondroitine, a nutraceutical, has shown some success in reducing pain and progression of OAS [3]. Other alternative therapies, including magnetic therapy and acupuncture, seem to improve symptoms in some people [3].

5 CONCLUSIONS

Magnetotherapy is derived from the biological influences of magnetic fields on all the living organism. All of us are bio-electromagnetic beings that generate a measurable flow of current (also known as life-force) in the process of life. When magnetic fields are properly applied (polarity, intensity, and frequency) there is a natural amplification of the human or animal's bio-electromagnetic life-force. This amplification of energy is used internally to produce positive and beneficial results in the treatment of illness, the alleviation of pain, and the general promotion of wellbeing. An applied magnetic field penetrates every single cell being exposed to the field and influences the ions, water molecules, and enzymes within the cells. Results of these influences are enhancement of ion exchange, reduction of size of water molecule, and impact on enzymatic processes that will improve the metabolic processes and oxygen utilization of the cells [2]. This is important for the healing and regeneration processes of cells, tissues, and all organism.

Treatment with MADU strips and N oriented magnetophores attained acceleration of the metabolic and regenerative processes. Their regenerative processes can be so successful that, besides qualitative renewal of the structure of the bone tissue, it can lead to the formation of new joint space, which creates a better and more efficacious function of the joint, with a better quality of life.

For devotees of alternative medicine, we explain how magnetotherapy fits into the context of other practices, such as Traditional Chinese medicine, and how it can be used in conjunction with acupuncture, massage, and other therapies.

The achieved results, affirmed and interpreted due to latest research of pathophysiological mechanisms, justify the application of the MADU methods, for the treatment of the OAS. Due to its principal effects, the application of this non-invasive and environment-friendly medical magnetic device opens new possibilities in providing efficacious health care and better quality of life. Magnetotherapy is the treatment that promises to revolutionize 21 st-century medicine [9].

REFERENCES

- [1] R. Lawrence, P. J. Rosch, J. Plowden, *Magnets and General Health*, In: Magnet Therapy: The Pain Cure Alternative, Chapter 6, Prima Health, Rocklin, 1998, pp. 127-151.
- [2] D. Djordjevic, *Discussion*, In: The Magnetic Field Influences on The Mechanisms of Neurohumoral Regulation, Chapter V, Ph.D. University of Belgrade, Medical Faculty, Belgrade, 2008, pp. 210-292.
- [3] C. L. Crowther, K. L. McCance, *Alterations of Musculoskeletal Function*, In: Pathophysiology: The Biologic Basis for Disease in Adults and Children, 5th Ed., Unit XII, Chapter 42, Elsevier/Mosby, St. Louis, 2006, pp. 1497-1543.
- [4] E. N. Lane, T. J. Schnitzer, *Osteoarthritis*, In: Cecil Medicine, 23rd Ed., Section XXII, Chapter 283, Saunders/ Elsevier, Philadelphia, 2008, pp. 1993-1998.
- [5] F. Rutsch, R. Terkeltaub, *Deficiencies of Physiologic Calcification Inhibitors and Low Grade Inflammation in Arterial Calcification: Lessons for Cartilage Calcification*, Joint Bone Spine **72**, 2, 2005, pp. 110-118.
- [6] M. Lotz, *The Role of Nitric Oxide in Articular Cartilage Damage*, Rheum. Dis. Clin. North Am. **25**, 2, 1999, pp. 269-282.
- [7] D. Proudfoot, C. M. Shanahan, P. L. Weissberg, *Vascular Calcification: New Insights Into an Old Problem*, J. Pathol. **185**, 1, 1998, pp. 1-3.
- [8] C. M. Porth, *Disorders of the Skeletal System: Metabolic and Rheumatic Disorders*, In: Essentials of Pathophysiology: Concepts of Altered Health States, 2nd Ed., Unit XII, Chapter 43, Lippincott Williams & Wilkins, Philadelphia, 2007, pp. 1015-1045.
- [9] R. Lawrence, P. J. Rosch, J. Plowden, *Twenty-First Century Medicine*, In: Magnet Therapy: The Pain Cure Alternative, Chapter 8, Prima Health, Rocklin, 1998, pp. 161-184.