MEDICINAL BIOMAGNETISM FOR ANALGESIA - APPLICATION OF STATIC MAGNETIC FIELD THROUGH MODERN TRAUMA PROTOCOL: CROSS-SECTIONAL OBSERVATIONAL STUDY

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Abstract: Pain is one of the most common reasons people seek medical care and is related to most

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disease states. It is estimated that the prevalence of pain varies from 37% to 70%, generating functional limitations and negative impacts on quality of life. Medicinal Biomagnetism (MB) is a therapeutic approach that corrects bioelectromagnetic dysfunctions through the application of Static Magnetic Fields (SMF), acting on the most varied pathological states. SMF can be applied in a controlled manner, locally to specific parts of the human body, aiming to improve inflammatory, infectious and dysfunctional conditions that can lead to pain. Objective: To evaluate the analgesic effects of applying one of the MB protocols, the Modern Trauma Pair (MTP), in participants with pain. Methodology: A cross-sectional observational study was carried out, where the MTP was applied to 30 participants who had some type of pain, using the Visual Analogue Scale, to assess the intensity of subjective pain. Results: A statistically significant difference ($p<0.001$) was observed between the times before applying the protocol (average of 6.87), and 15 minutes after applying the MTP. There was a progressive decline in reported pain perception, reaching an average of 4.74 for acute pain and 4.84 for chronic pain, after 60 minutes of use. Conclusion: MTP can be an important therapeutic approach for pain relief. The Medicinal Biomagnetism protocol, MTP can contribute quickly and with minimal side effects to analgesia in different types of pain.

Keywords: Medicinal Biomagnetism; Modern Trauma Pair; Biomagnetic Pair; Static Magnetic Fields; magnets; Pain Protocol; Pain; Analgesia.

INTRODUCTION

Pain is a survival and protection mechanism of extreme importance that allows alerting living beings to the danger associated with stimuli. The somatosensory nervous system, topographically and functionally organized, is responsible for physiologically processing painful stimuli. Although this system operates from a set of specific sensory neurons, it is activated exclusively by harmful stimuli through peripheral transduction mechanisms (Lee; Spanswich, 2006).

Raja and collaborators (2020) present a review requested by the International Association for the Study of Pain (IASP) on the concept of pain, where it was defined as “an unpleasant sensory and emotional experience associated with, or similar to, actual or potential tissue injury”.

Pain can have several causes, affect several tissues, and have different durations; it can be classified according to the duration, location, and possible association with some pathology, as cited by Janeiro (2017), being acute pain defined as “pain of recent onset and limited duration with usually a temporal and/or causal definition” (Direção-geral da Saúde, 2001), and chronic pain, is associated with tissue destruction, being prolonged over time, from 3 to 6 months and can lead to a type of suffering that seems almost unbearable (Direção-geral da Saúde, 2008).

According to the IASP (2020) pain is classified as nociceptive, which is, acute caused by some injury such as cutting, fracture, postoperative, arthrosis, or abscess; neuropathic, considered chronic pain due to injury to the nervous system manifested by burning sensations, electrical discharge or tingling; and psychogenic, that is the pain related to emotional disturbance, such as migraine, stomach pain and contractures, whose diagnosis is difficult because there are no visible lesions or causes, it is important to give voice to the person about his pain experience, because it has an adaptive role, and may have adverse effects on function and social and psychological well-being (Raja et al., 2020).

Approximately 60 million people suffer from chronic pain, accounting for about 10 % of the world’s population (Goldberg; McGee, 2011). In Brazil, in a systematic review of 35 studies on the prevalence of chronic pain, it was observed that it ranged from 23.02 % to 76.17 %, with a national average of 45.59 %, with the female sex being the most affected. A higher prevalence was found in the Midwest region (56.25%), but the region with the most studies and the largest population analyzed was the Southeast region (42.2 %). Considering the IASP classifications of mechanisms, possibly nociceptive pain had a prevalence of 36.70 %, neuropathic pain was 14.5 % and psychogenic pain was 12.5 % (Aguiar et al., 2021).

The prevalence of severe chronic pain (intensity greater than or equal to 8, considering a scale from 0 to 10) is around 10 % and chronic pain with severe or generalized limitation is around 5 % (Wol-

fe et al., 2011; Wolfe et al., 2016; Arnold et al., 2019; Whoqol, 1997).

Low back pain is the most common chronic pain, followed by pain in knees, shoulders, head, back, and legs or lower limbs, according to a study conducted in Brazilian capitals showing a prevalence of 77 % for back pain, 50 % in the knee, 36 % shoulders, 28 % ankles, 23 % hands and 21 % cervical (Pedroso et al., 2011).

Pain is considered a subjective and influential experience, and can vary in degree, by biological, psychological, and social factors (Raja et al., 2020). When uncontrolled, chronic pain can cause negative impacts on the individual's health, such as stiffness, immobility, psychosomatic and sleep quality changes, loss of autonomy, functionality, and independence, as well as difficulties or inability to perform basic daily life activities (Pereira et al., 2014; Thé et al., 2016). In this way, the guidelines have recommended interdisciplinary treatment, which ideally uses a personalized approach with a shared decision model (Steglitz; Buscemi; Ferguson, 2012; Gatcheli et al., 2014).

The most common treatment for pain in general is allopathy. Non-steroidal anti-inflammatory drugs (NSAIDs) are the most used medicines for the relief of pain and inflammation because they have analgesic, antipyretic, and anti-inflammatory properties, as they inhibit the COX enzymes (cyclooxygenases) and the production of prostanoids (Burke; Smyth; Fitzgerald, 2012).

Opioids are considered powerful analgesics used to treat moderate to severe chronic pain. In contrast, opioid treatment is associated with several common adverse effects, including constipation, nausea, vomiting, pruritus, drowsiness, cognitive impairment, dry mouth, tolerance, dependence, and urinary retention. Severe acute pain is typically treated with potent opioids (Blondell; Azadfard; Wisniewski, 2013).

Chronic pain is considered a complex and far-reaching problem, as the challenges extend to the individual, family, and social levels. Thus, therefore, it is necessary to seek systemic and innovative solutions that can act at the biological but also systemic level. Complementary and Integrative Medicine (CIM) therapies focus on the patient, in their healing processes, thus, can provide a treatment, and can be considered relatively safe and economical. CIM is classified into mind-body therapies, motion thera-

pies, physically oriented therapy, and sensory art therapy as well as multimodal integrative approaches (Crawford et al., 2014).

Pain is one of the most common reasons why people seek care, whether conventional or integrative and complementary (Fan et al., 2021). The World Health Organization (WHO) understands Traditional Medicine / Complementary and Alternative Medicines, the therapeutic resources of both the complex medical systems of traditional Chinese Medicine, Hindu Ayurveda, Arab Unani Medicine, and various indigenous medicines, as well as practices, with or without drugs, of common and popular use, recognizing their importance with the responsible, safe and trained practice of Integrative/Complective Therapies (OMS, 2002; Brasil, 2006).

The Integrative and complementary practices (ICP), implemented in Brazil´s healthy care system (SUS) in 2006, have proven their efficacy and can be observed in the union between conventional medicine treatment and ICP in the management of acute and chronic pain and are offered within the scope of basic care, of medium and high complexity, being non-invasive, except acupuncture, providing emotional balance, psychobiological, psychosocial and psychospiritual energies, aiming to restore, harmonize, balance, and maintain the integrity of the body, mind, emotions and spirit (Posso, 2021; Brazil, 2018).

In general, both conventional and integrative medicine use magnetic fields that can be applied locally on specific parts of the human body with high penetration and easy time control of their application (Fan et al., 2021).

A Static Magnetic Field (SMF) is described as a constant and immutable vector field of an electrical current or a permanent magnet, being a force that interacts with biological systems, and magnetic resonance is one of the examples of this interaction (Marycz; Kornicka; Rocken, 2018). Magnetism and its effects on healing also take place in traditional and integrative medicine. SMF is a biophysiological stimulant that modulates processes in different cell lineages (Molo; Ordu, 2021).

According to Oliveira and collaborators (2018), the application of SMF improved the symptoms of inflammation, pain, and stiffness in the elderly. The Medicinal Biomagnetism (MB) technique

also uses SMF for analgesia purposes, as demonstrated in some studies (Santos et al., 2023; Lima et al., 2023; Gomes et al., 2022; Araújo; Ferreira; Bossa, 2023). In this sense, Integrative and Complementary Magnetic Practices, especially MB, demonstrate great therapeutic potential for the improvement of pain, and should be studied with more rigorous and more detailed methodological processes, as observed by Eccles (2005) and reinforced by Fan and collaborators (2021).

Fan and collaborators (2021) found that 64 % of human studies and all mice studies in the literature showed positive analgesic effects of SMF, which are related to factors such as their intensity, treatment time, and types of pain. The study concluded that greater intensity and/or longer treatment time may have better relief effects in specific types of pain.

One of the ways in which SMF acts on the cell is through the par radical mechanism. The radicals of opposite charges, positive and negative, generated by a simultaneous chemical reaction with magnetic properties, are affected by the action of SMF that rebalances the previously excess charges and thus modulates the redox system (reduction oxide reaction) (Cruz, 2005; Molinari et al., 2018; Li et al., 2020; Carter et al., 2020; Feng et al., 2022).

For Wang and Shang (2022) SMF is the basic form of magnetic field and the basis of other forms of electromagnetic field, which can induce partial changes in cell cycle, cell adhesion, cytoskeletal changes, and degrees of influence on cell proliferation and differentiation. The cellular biological effects of magnetic fields may be related to intracellular signaling paths and other charged molecules, such as membrane receptor proteins and calcium ion signaling pathways.

Medicinal Biomagnetism is a therapeutic system that uses SMF generated by magnets to correct bioelectromagnetic dysfunctions (Durán, 2008; 2014; Corrêa et al., 2023). SMFs are applied to Biomagnetic Pairs (BMP), which consist of bioelectromagnetic dysfunctions generated by ionic polarization of biochemical elements. One pole tends to alkalinity and the other to acidity beyond normal to the organ or region that supports them (Bossa et al., 2023).

The MB technique enables the rebalancing of bioelectric charges and the adjustment of the local hydrogen potential (pH). It allows the identification and treatment of BMP that are related to various

pathologies. The treatment of BMP is carried out with medium-intensity magnets, which can range from 1000 to 7500 Gauss, being a completely mechanical therapeutic technique, which does not use electrodes or electricity. The SMF generated by the magnets stimulates the restoration of the immune system, controlling the pathogenic activity of microorganisms, as well as enabling the detoxification of the body and hormonal modulation. In this way, MB can act on various types of pathologies, including chronic multifactorial diseases such as diabetes, cancer, arthritis, rheumatism, fibromyalgia, and autoimmune diseases (Martini et al., 2023; Macedo et al., 2023; Bueno et al., 2023; Gomes et al., 2022).

Pelissari and Bossa (2023) describe that, MB is considered an integrative medicine, while Foltran and collaborators (2023) conclude that MB is a bio-electromagnetic therapy based on conventional medical principles of anatomy, biology, biochemistry, biophysics, physiology, physiopathology and microbiology, based on magnetism, entropy, symbiosis, pH, magnetic resonance, homeostasis, and fluid rheology (Bossa et al., 2023).

The MB has several procedures, strategies, and protocols for the application of magnets in different diseases. Among these, the " Modern Trauma Pair (MTP), used in various types of pain, inflammation, healing, and reduction of edema, with the advantage of being simple, non-invasive, whose side effects, when they arise, mild and transient, such as relaxation, drowsiness, and increased diuresis (Martínez, 2018; 2021). Thus, the objective of this study is to evaluate the analgesic effects of the application of one of the MB protocols, the MTP, in participants with pain.

METHODOLOGY

A cross-cutting clinical study was conducted between August and September 2023 following the protocol presented by Santos and collaborators (2023). The research was developed at an Institution of Higher Education (IHE) – Instituto Par Magnético – IPM and the Faculty of Governance, Engineering and Education of São Paulo – FGE-SP.

This study included individuals with any type of pain complaint, being over 16 years of age,

reading, agreeing, and signing the Free and Informed Consent Form (ICF), or their guardians.

Those excluded were those who were continuously using or had used of analgesic medication up to 7 days before starting the collections, as well as any other medication that may have an analgesic effect, those who presented clinical contraindications to the application of Static Magnetic Fields, such as the use of pacemakers and intracorporeal batteries, women in pregnancy and those who presented physical or cognitive factors limiting or impeding the understanding and execution of the proposed protocol. After applying the criteria, 30 participants received a single application of the Modern Trauma Pair protocol, which lasted 60 minutes.

The collections were carried out at different periods of the day, where part of the participants received applications in the morning period, part in the afternoon period, and part during the evening to evaluate the distinction of the results.

To start clinical practice and data collecting, an anamnesis was first applied, in which personal information was collected such as name, age, address, and telephone number, as well as information related to the emotional life history, history of current and previous diseases, physiological, family and social of the participants. We also used the Visual Analogue Scale (VAS), a numerical scale ranging from 0 to 10 (0, absence of pain, 5, moderate pain, and 10, worse perceived pain) to identify the subjective perception of pain (Martinez; Grassi; Marques, 2011; Gift, 1989).

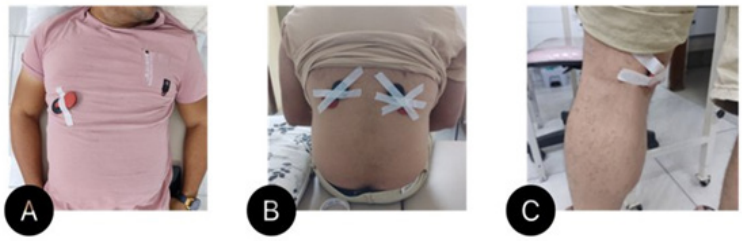
The first quantification was performed at the time of the participant's arrival (VAS Pre-1). After 30 minutes of this first collection, the VAS (called VAS Pre-2) was applied again. Immediately after, the MTP was applied and the pain was quantified by evaluating the effects of the use of the MTP protocol in times of 15, 30, and 60 minutes. (VAS 15, VAS 30, and VAS 60 consecutively).

The protocol of Medicinal Biomagnetism used for the treatment was the adapted MTP of Martínez (2018), which consists of applying, at the place of pain, the north pole of a magnet, following the convention of Calegari and collaborators (2023) and, simultaneously, two magnets of opposite polarities in the region of the liver and in each of the kidneys (Figures 1 and 2).

Figure 1: Modern Trauma Protocol (MTP)

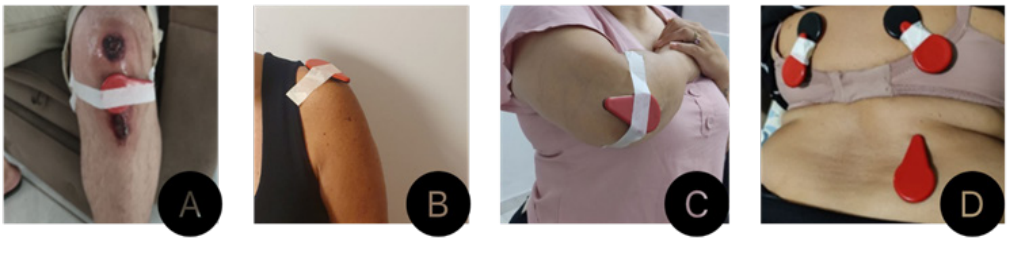
Legend: The first image represents the application of the magnet's north polarity onto the algal complaint, represented on the heel tendon of the lower right limb. This is the only variable region of application of the magnets and remains on the anatomical point of pain complaint of each participant. The second image represents the application of double polarity of the magnets in the region of the liver, following the clavicular middle line, the north pole being applied medial and higher in relation to the south pole. The application follows 5 fingers below the nipple. The third and fourth images represent the application of double polarity in the upper region of the kidneys, the south pole being applied medial and upper relative to the north pole, at the height between the dorsal vertebrae 9 and 11. Image source: application of double polarity in the upper region of the kidneys, the south pole being applied medial and upper relative to the north pole, at the height between the dorsal vertebrae 9 and 11. Image source: Bossa (2023).

Figure 2: Clinical application of MTP



Legend: Image "A" shows the application of two magnets, of opposite polarities (double polarity) in the liver region; image "B" demonstrates the application of the magnets also with opposing polarities in both kidneys; picture "C" indicates the application of a single magnet of northern polarity in the inner medial region of the knee, location indicated with pain by the participant (local variable according to individual complaint). Image source: the authors.

Figure 3: Application of MTP at the place of pain complaint



Legend: Image "A" demonstrates the application of the magnet's north polarity to the left knee patella, region of the algic complaint, originating from the fall of the motor; image "B" shows the application to the right shoulder of the magnet's North Polarity; the picture "C" show the application in the right elbow of the north polarity of the Magnet; and the image "D" shows that the magnet is applied to the lower right lumbar region (the magnets applied in the kidneys are also observed). Image Source: the authors.

Neodymium magnets of moderate intensity (Zhang; Yarema; Xu, 2017), were used for this study, with an approximate magnitude of 0.4 Tesla (4.000 Gauss), in axial-polarized disc format, with

dimensions of 6.4 cm in length, by 0.5 cm in thickness and 3.8 cm in width, coated with non-toxic and hygienic PVC. The north polarity of the magnets is encased in black color and the south, red, following the convention described by Calegari and collaborators (2023).

The data were described in standard averages/deviation for continuous variables, and count/ frequency for categorical variables, and a two-way repeated measurement ANOVA was used to investigate differences in the VAS score in relation to the moment of application, type of pain, and a possible effect of the interaction between moment X pain type. Subsequently, a post-hoc test was conducted to identify significant differences between the averages of the different groups. The statistical software used was: R (4.2.3). All analyses considered the value of 0.05 as a level of significance for the p-value.

RESULTS

Of the 30 participants who received the Modern Trauma Pair protocol, 23 were female (77 %) and seven were male (23 %), aged between 16 and 71. Of these, 18 (60 %) had chronic pain, and 12 (40 %) had acute pain. (Table 1).

Table 1: Descriptive analysis of participants

Variables	n (%)	Mean (standard deviation)
Sex		
Masculine	7 (23 %)	
Feminine	23 (77 %)	
Age		47 (14)
Session times		13:48 (03:52)
Session period		
Morning	15 (50 %)	
Afternoon	6 (20 %)	
Night	9 (30 %)	
Type of pain		
Acute	12 (40 %)	
Chronic	18 (60 %)	

Caption: n = number of participants.

The magnet's north polarity was applied to the spine regions (cervical, sacral, and lumbar), upper limbs (arms and elbows), lower extremities (feet and knees), and ribs. Regarding the anatomical region, the most prevalent was the knee (33 %), followed by the spine (30 %, 13 % lumbar, 10 % cervical, and 7 % sacral) and feet (13%).

Using an ANOVA of repeated two-way measurements to investigate differences in VAS score regarding the moment of application and the type of pain revealed that only the moment of application differed between participants (Table 2, p<0,001). Both the pain type (p=0.78) and the interaction between the time of application and the type of pain (p =0.63) did not differ between participants.

Table 2: ANOVA of repeated measurements (two-way) involving the time of VAS application and the type of pain

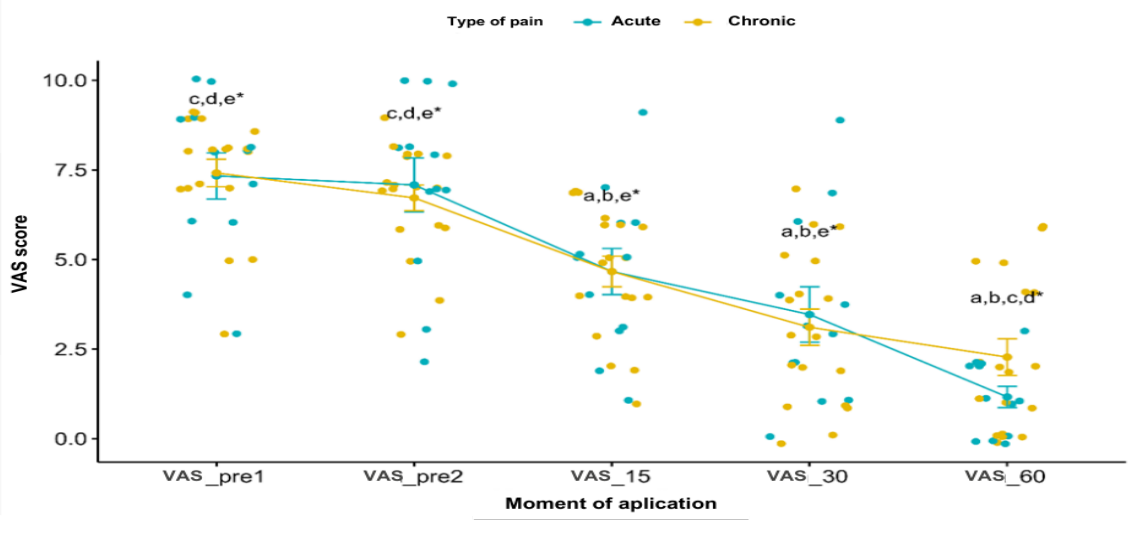
	Moment of aplication					Type of pain		ANOVA		
	VAS Pré-1	VAS Pré-2	VAS 15	VAS 30	VAS 60	Acute	Chronic	Moment (F, p)	Type (F, p)	Moment x Type (F, p)
Mean ±	7,38 ±	6,87 ±	4,67 ±	3,25 ±	1,83 ±	4,74 ±	4,84	**40,61**	0,08	0,64
SD	1,86	2,00	1,95	2,33	1,86	3,17	± 2,71	**(<0,001)**	(0,78)	(0,63)

Caption: dp = standard deviation; F = ANOVA coefficient; data in bold depict statistical difference ($p < 0.05$).

Bonferroni's post-hoc test identified differences between the moments of VAS application (Figure 4). The Pre-1 and Pre-2 moments did not differ from each other, however, in the course of the

application of the MTP differences were identified at the moment 15, at 30, and 60, demonstrating a progressive decline in the score. Furthermore, no difference was identified between moments 15 and 30 (Figure 4).

Figure 4: Post-hoc analysis between the different times of the VAS application



Legend: A: VAS Pré-1; B: VAS Pré-2; C: VAS 15; D: VAS 30; E: VAS 60. The minuscule letters represent the statistical differences between the moments. * $p < 0,05$.

After the application of the Static Magnetic Fields, using VAS, pain reduction can be observed in 29 of the 30 participants (96.67 %), at the time of VAS 15, as shown in Figure 4. The perception of pain remained in decline after 30 minutes of application (VAS 30) and at the time VAS 60. Considering VAS 60 results, it was observed that in 30 % of cases, there was total analgesia (intensity equal to 0), 20 % intensity 1, 26,67 % intention 2, and 3,33 % intensity 3, totalling 80 % of the cases with pain of mild intensity or absence of pain.

Through this study, it was identified that with a single application of MTP, after 15 minutes, in 96.67 % of participants, there was a reduction in pain. At the time of VAS 15, some participants had numbness and/or slight warming at the application site. During VAS 30 the level of analgesia remained in relation to the time of VAS 15, however, no numbness or local warming was observed, achieving significant analgesia at VAS 60. It is highlighted that, severe chronic pain (intensity 8 by VAS) was completely relieved. Severe acute pain (intensity 8) was reduced to mild pain (intention 1) and ceased after 60 minutes, and a prolonged effect of analgesia was observed over 30 days. According to the statistical results, a progressive decrease was observed in VAS times, not identifying any difference in relation to the type of pain.

DISCUSSION

For the first time, it was possible to observe a progressive drop in a visual analog scale of pain with the application of magnets. It was possible to identify a progressive decrease in the subjective assessment of pain during the Modern Trauma Protocol (PTM), considering that this decrease followed the same pattern for both acute and chronic pain cases. The effect of the protocol stands out for the fact that there was a significant drop in the pain scale immediately after 15 minutes of the intervention. The decrease in the subjective pain scale was significantly repeated 60 minutes after the intervention, which demonstrates the positive effect of the application of the PTM in these participants.

According to Brazilian Health Regulatory Agency (ANVISA), as reported by Santos and collaborators (2023), pain is usually combated by Allopathic Medicine through the use of common analgesics and opioids. Each medication has its most appropriate indication and its limitations, as well as, presents several side effects, and some of them can be very harmful, as shown in bullets (ANVISA, 2021a; 2021b; 2021c; 2021d; 2021e). Opioid analgesics are synthetic drugs that have narcotic effects similar to opium products (opiates) that, by binding to certain receptors in the central nervous system, decrease pain signals to the brain (Preuss; Kalava; King, 2021).

Santos and collaborators (2023) show that the average time for an allopathic drug to begin its action varies from 15 to 20 minutes for paracetamol, 30 to 60 for dipyrone, and from 45 minutes to 5 hours for tramadol, depending on the type of application. Conventional, opioid, and non-opioid treatments relieve pain, however, despite their beneficial effect, they can cause important side effects, especially related to the gastrointestinal tract, as well as, addiction effects in some cases (ANVISA, 2021a; 2021b; 2021c). No adverse effects were observed in this study concerning the use of MTP.

MB is a therapeutic approach that corrects bioelectromagnetic dysfunctions through the application of SMF acting on the most varied pathological states. The results showed a significant reduction in the intensity of pain after the application of MTP, which is aligned with other studies already described in the literature. Eccles (2005) evaluated the quality of randomized control studies and noted that in 11 of the 15 that were evaluated, the static magnetic fields generated by the magnets demonstrated analgesic effects in inflammatory, neuropathic, skeletal muscle, rheumatic, fibromyalgic, and post-surgery.

Mayrovitz and collaborators (2021) conducted a double-blind study with 36 women in the menstrual period using a false magnet (placebo) and the other true magnet (experimental treatment), and concluded that of the 19 individuals of the experimental group, 11 had significant pain reduction and eight did not, while of the 17 women in the placebo group, only three experienced a significant reduction in pain, being statistically significant, based on the non-parametric Mann-Whitney test.

Gomes and collaborators (2022) observed that therapy with Biomagnetic Pair was effective in the treatment of pain in a patient with tuberculosis meningitis, which presented unbearable pain in the head, cervical spine, lumbar, equine tail region and lower limbs, being carried out 9 sessions, having, after the first session, a significant reduction in pain.

A case study by Cazella and collaborators (2023) showed that participants who were treated for urinary tract infections using a MB protocol, had elimination of E. coli infection and remission of allergic symptoms. Araújo, Ferreira, and Bossa (2023) evaluated the treatment of 290 patients who received Medicinal Biomagnetism therapy, demonstrating improvements in pain, such as headaches and muscle pain, regardless of sex or age, observing the restoration of health.

The results of the analysis of VAS in the present study corroborate with the report by Santos and collaborators (2023) who observed that the application of MTP in the exfoliation of fingers of the hands, ceased beating pain after 10 minutes of its use and at 15 minutes, the analgesia stabilized. At 15 minutes of application, the fingers with perceived pain level 8, had achieved an analgesic effect, while the finger with intensity 10 pain began to have a perception of mild pain, level 2. 24 and 36 hours after, in the case report, the analgetic effect persisted.

The analgesic effects found in this study can be supported by the one described by Albuquerque and collaborators (2016), who describe some proposed alignments for these effects, such as recombination of radical pairs and diamagnetic anisotropy that can affect the susceptibility of biomolecules and structural modifications of enzymatic reactions. In a Feng study (2022) permanent N38 neodymium grid magnets with a length of 60 mm × 50 mm width × 35 mm height, of approximately 0.5 T (5,000 G) were applied to wounds of diabetic mice, and it was demonstrated that the magnetic field can decrease oxidative stress, promote wound healing, reduce the accumulation of hepatic lipids and kidney defects in these animals.

Perez (2022) through greenhouse experiments to evaluate the effect of magnetic fields on NIH3T3 fibroblast cells, identified significant effects on proliferation and rate of cell mitosis in 3T3, concluding that SMF generated by neodymium magnets in the horizontal direction in relation to the preparation, increased by approximately 53% the cell proliferation of NIH3/T3 fibroblasts after 24 hours of exposure.

When analyzing ANOVA you can observe a progressive decrease in the level of pain at different times, especially after VAS 30, having no difference, however, about the type of pain, no statistical difference was observed. This indicates that this protocol has great therapeutic potential, both in acute and chronic pain.

CONCLUSION

This study demonstrated that the Modern Trauma Pair (MTP) protocol of Medicinal Biomagnetism (MB) is a complementary therapy with great therapeutic potential. It can contribute quickly to the relief of pain, be it acute or chronic, with minimal or no side effects. A tendency towards a progressive decrease in pain has been demonstrated, with its highest effectiveness after 30 minutes of protocol application. The present study presents methodological limitations, such as lack of statistical delineation, as well as, lack of placebo study, more research is needed to fully understand the mechanisms underlying the analgesic effects of SMFs through MTP and to determine the possibility, in the long term, of this therapeutic approach. Despite the important results found, further research is also needed to demonstrate its long-term action and determine potential differences in its use for acute and chronic pains, as well as for the location of the pain complaint.

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