25 - MAGNETOTHERAPY ACTION MECHANISM IN INFLAMMATORY PROCESS

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INTRODUCTION

Only a low intensity magnetic field is necessary to make chemical reactions that may have biological effect in the body (GERBER, 2000). The magnetic energy changes the electron flow generating events that affects body molecules conformation, may causing alteration to the velocity of cell, enzymatic and organic processes, besides making changes in the body (HENEINE, 2000).

The G field theory explains that every matter emits an electromagnetic field, made by electric and magnetic that interact with the bio systems in fluid flow, gas expansion, integral proteins conformations, receptors, etc. eukaryotic cells have electrical potential along their membranes in the order of 0,05 to 0,2 Volts, with the interior more negative than the exterior, which contributes to the ion transportation. Cellular machinery uses free energy, a kind of electromagnetic energy to realize its functions. The Calcium ions has a high importance in this study.

The plasma membrane of SER (smooth endoplasmic reticulum) may receive influence of the magnetic energy, resulting better equilibrium of Calcium ion control (MAIA, et al., 2010), used to transmit different kinds of signals that may turn on or interrupt cell functions (HENEINE, 2000). The Calcium pump of SER with its high affinity for this ion (JUNQUEIRA, 2008), also would facilitate the direction across the membrane against a big electric chemistry gradient to the entrance and exit of the ion Calcium. What would interfere in nerve synapsis related to pain, due to the influence in ionic selective channels of neurons, which can generate fast alterations on these channels activities, inducing changes on potential action of membranes that transport signals from one neuron extremity to another neuron (LENHNIGER, 2000).

The application of magneto therapy influences edema solutions, often followed by pain tissue phenomenon that causes physical discomfort, caused by sensorial stimulus noniceptors activation. Many kinds of pains, especially muscular pain, are also associated to increase of tissue acidity on the site around the pain. The acidity is often caused by buildup of lactic acid, sub product of muscular metabolism (MORRIS, SKALAK, 2004) that can causes fatigue syndrome due to intensity excess and physical exercises duration (MARTINEZ; ALVAREZ-MON, 1999). The magnetic energy action on Calcium channels equilibrium may affect the receptors and acetylcholine release, influencing the opening these ion-tropic channels, changing the membrane depolarization and muscular contraction. This would lead to a relaxing less painfully stimulus on the inflamed place and a interference at pain process (HOLCOMB; et al, 2000).

The microvascular circulation shows sensibility to magnetic field influence, affecting arterioles' tonus and diameter, which can facility the solution of edema formation, inflammatory processes (MORRIS; SKALAK, 2004) and physical traumas. The thermodynamic quantum evaluates molecules behavior in micro processes through entropy as one parameter. Magnetic poles generate naturally entropy (SOUZA, 2005) in biological systems.

The therapeutic application of 740 gauss north pole acts in acute inflammatory processes, tissue injured by trauma, the presence of bruises, muscle pain due to trauma, pain caused by muscle fatigue from overexertion by improper loading and joint pain The south pole acts in chronic inflammatory processes accompanied by pains in the organization of collagen fibers assisting in wound healing, both in the muscle as consolidadação bone fractures. The north and south poles elevate tissue oxygenation helping the arrival of defense cells (SOUZA, 2005)

Entropy is related to organization of a system and its information containment in an inversely proportional relationship. When the entropy is increased, organization and a system's information are decreased; and when the entropy is decreased, organization and information are increased, causing homeostasis.

MATERIALS AND METHODS

The study will be realized through literature review and use of magneto therapy in inflammatory processes, joint and muscular pain relates.

OBJECTIVES

Know how magnetic energy acts human beings' inflammatory process and joint and muscular pain.

RESULTS

Application of 740 Gauss magneto north pole above the inflamed and painful place causes negative entropy effect through a delicate adjustment of tissue PH, interfering on the electric flow of pain information and generating homeostasis in cases of acute inflammation (BRAGA; ROSA; ARAUJO, 2004). 740 Gauss magneto South Pole acts on inflammatory chronic processes of joint and muscular pain, bringing local homeostasis (GUILLOT, 2001).

CONCLUSION

Magnetic energy can influence metabolism, tending to a negative entropy through the Hall Effect, interfering on plasma membrane fluidity, inflammatory process (SALINAS; RODRIGUEZ; VIAMONTES, 1996). Acting on balance of Calcium channel might affect the receptors and releasing acetylcholine, influence the opening of those ion tropic channels, changing the depolarization of membrane and changing muscular contraction. This would lead to a local relaxing with less painful stimulation on the inflamed site and interfering at pain process.

Application of 740 Gauss magnetos influence the microcirculation, and the arterioles diameter, in a restorative way, acting to normalize tonus after the exposition and as response a significate influence (MORRIS; SKALAK, 2004) on tissue perfusion.

Magnetic therapy is a non-painful, non-invasive and cheap method that can be used for short or long time, associated or not with others treatments or drugs (MCLEAN, ET AL., 2003), doesn't cause the gastric and kidney side effects of anti-inflammatory drugs. Due to the high number of people that suffer from those problems and show joint and muscular pain (HINMAN; FORD; HEYL, 2002) with significate consequences related to side effects from medication used usually for a long time in pain and inflammation chronic process.

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MAGNETOTHERAPY ACTION MECHANISM IN INFLAMMATORY PROCESS

ABSTRACT

The capacity of magnetic fields interfere in the electrons flow is described in physics as Hall Effect. This effect happens by changing the bioelectric flow of the body (LENHINGER, 2002), which is directly connected to pain relief (HINMAN; FORD.; HEYI, 2002). The cell plasma membrane is made of molecules that form proteins and enzymes sensible to the action of temperature, ph. and ions flow. The magnetic energy changes the electron flow generating events that affect the cell conformation of molecules in the body, and can change the velocity of cell, enzymatic and organic processes, making chances in the body (HENEINE, 2000). The use of magneto therapy by applying magnetos above the site of inflammation is a therapy with significant effects (SOUZA, 2005), non-invasive, cheap cost and does not cause side effects as anti-inflammatory drugs causes in kidney and digestive systems. OBJECTIVE: investigate how magnetic energy acts in human beings, on theirs joint and muscular inflammation. METHODS: This study will be developed by literature review and analysis of 740 Gauss magnetos use in body parts with joint and muscular pain, applying north and south poles. RESULTS: the use of magneto's north pole above the inflamed place with pain, causes negative entropy effect through a delicate adjustment on tissue PH (BRAGA; ROSA; ARAUJO, 2004), interfering on electric electron flow of pain information and generating homeostasis in acute cases. The South Pole acts on inflammation process, muscular and joint pain, all of them chronic, decreasing pain and inflammatory process (SCHNEIDER, 2013).

KEYWORDS: magneto therapy, magnet, inflammation, pain.

MÉCANISME D'ACTION DE PROCESSUS INFLAMMATOIRE DANS MAGNETOTERAPIA

RÉSUMÉ

La capacité des champs magnétiques interférer avec le flux d'électrons est décrit dans la physique comme effet Hall. Cet effet se produit en modifiant le flux de corps bioélectrique (LENHINGER, 2002), qui est directement liée à l'allégement de la douleur (Hinman, MR, Heyl H. FORD J;.., 2002). La membrane plasmique de la cellule est composée de molécules de protéines qui forment et sensible à l'action de la température, le pH, et le flux d'ions enzymes. L'énergie magnétique modifie le flux d'électrons de générer des événements affectant la conformation des molécules dans le corps et peut changer la vitesse de la cellule, enzymatique (Schwengber, 2009), les processus biologiques et faire des changements dans le corps (Heneine, 2000). L'utilisation d'un aimant magnétique en appliquant au site de l'inflammation est un des effets importants thérapeutiques (Souza, 2005), non-invasive, peu coûteuse et ne provoque pas d'effets secondaires des médicaments anti-inflammatoires dans le système digestif et les reins. Objectif: apprendre énergie magnétique agit sur le processus inflammatoire chez l'homme dans l'inflammation des articulations et des muscles. Méthodes: Cette étude sera développé à travers une revue de la littérature et l'analyse des rapports sur l'utilisation d'aimants avec 740 Gauss dans les régions du corps avec douleurs musculaires et articulaires, avec des applications au niveau du pôle nord et le pôle sud. Résultats: application du pôle nord de l'aimant sur le site enflammé et dans la douleur, parce que l'effet de l'entropie négative à travers une fine-tuning de Ph de tissu (Braga, Rosa; Araujo, 2004), en interférant avec le flux électrique de l'information de la douleur et génération homéostasie dans les cas aigus. Le pôle Sud fonctionne dans les cas chroniques de l'inflammation, douleurs musculaires et articulaires résultant de diminuer la douleur et l'inflammation (Schneider, 2013).

MOTS-CLÉS: magnétiques, aimants, inflammation, douleur.

MECANISMO DE ACCIÓN DE PROCESO INFLAMATORIO EN MAGNETOTERAPIA
RESUMEN

La capacidad de los campos magnéticos para interferir con el flujo de electrones se describe en la física como de efecto Hall. Este efecto se produce por la alteración del flujo de cuerpo bioeléctrica (LENHINGER, 2002), el cual está directamente relacionado con el alivio del dolor (HINNAM, MR, HEYL H. FORD J;.., 2002). La membrana plasmática de la célula se compone de moléculas que forma y sensible a la acción de la temperatura, pH, y flujo de iones a las enzimas de proteínas. La energía magnética cambia el flujo de electrones generación de eventos que afectan a la conformación de las moléculas en el cuerpo y puede cambiar la velocidad de la célula, enzimática (SCHWENGBER, 2009), los procesos orgánicos y realizar cambios en el cuerpo (HENIENE, 2000). El uso de magnetoterapia mediante la aplicación en el sitio de la inflamación es uno con efectos terapéuticos significativos (SOUZA, 2005), no invasivo, de bajo costo y no causa efectos secundarios de los fármacos anti-inflamatorios en los sistemas digestivos y renal. Objetivo: aprender magnética energía actúa sobre el proceso inflamatorio en los seres humanos en la inflamación articular y muscular. Métodos: Este estudio se desarrollará a través de una revisión de la literatura y análisis de los informes sobre el uso de imanes con 740 Gauss en regiones del cuerpo con dolor muscular y articular, con aplicaciones en el polo norte y el polo sur. Resultados: Aplicacióndel polonorte del imánen el sitioinflamadoy con dolor, porque el efectode la entropíanegativamediante unajuste depHtejido(BRAGA; ROSA; ARAUJO, 2004), lo que interfiere conelflujo eléctricode la informacióndel dolor yhomeostasisde generaciónen los casos agudos. ElPolo Suroperaen los casos crónicosde inflamación, dolor muscular y articularresultantea disminuir el dolory la inflamación(SCHNEIDER, 2013).

PALABRAS CLAVE:magnéticos, los imanes,inflamación, dolor.

MECANISMO DE AÇÃO DA MAGNETOTERAPIA NO PROCESSO INFLAMATÓRIO
RESUMO

A capacidade dos campos magnéticos interferirem no fluxo de elétrons é descrita na física como efeito Hall. Tal efeito ocorre através da alteração do fluxo bioelétrico do corpo (LENHINGER, 2002), o qual está diretamente ligado ao alívio da dor (HINMAN, M. R.; FORD J.; HEYl. H., 2002). A membrana plasmática celular é composta por moléculas que formam proteínas e enzimas sensíveis à ação da temperatura, do Ph e do fluxo de íons. A energia magnética altera o fluxo de elétrons gerando eventos que afetam a conformação das moléculas do corpo, podendo alterar a velocidade dos processos celulares, enzimáticos (SCHWENGBER, 2009), orgânicos e realizar mudanças no corpo (HENEINE, 2000). O uso da magnetoterapia através da aplicação de magnetos no local da inflamação é uma terapêutica com efeitos significativos (SOUZA, 2005), não invasiva, de baixo custo e que não causa os efeitos colaterais dosmedicamentos anti-inflamatórios nos sistemas digestório e renal. Objetivo: Saber como a energia magnética age no processo inflamatório em seres humanos nas inflamações articulares e musculares. Métodos: Este estudo será desenvolvido através de levantamento bibliográfico e da análise de relatos do uso de magnetos com 740 Gauss em regiões do corpo com dores articulares e musculares, com as aplicações do polo norte e do polo sul. Resultados: A aplicação do polo norte do magneto sobre o local inflamado e com dor, causa o efeito da entropia negativa através de um delicado ajuste do pH tecidual (BRAGA; ROSA; ARAUJO, 2004), interferindo no fluxo elétrico das informações da dor e gerando homeostase nos casos agudos. O polo Sul atua nos processos crônicos de inflamações, dores musculares e articulares gerando diminuição da dor e do processo inflamatório (SCHNEIDER, 2013).

PALAVRAS-CHAVES: Magnetoterapia, imãs, Inflamação, dor.