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ORIGINAL

Ozone Therapy and Magnetotherapy in Patients with Acute Low Back Pain

El tratamiento con ozonoterapia y magnetoterapia a personas con dolor lumbar agudo

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ABSTRACT

Introduction: low back pain is among the most frequently treated conditions in rehabilitation centers in the municipality of 10 de Octubre, Havana; therefore, it is necessary to implement therapies that promote the prompt recovery of affected patients.
Objective: to assess the initial status for implementing a combined magnetotherapy and rectal ozone-therapy regimen in individuals with acute low back pain treated at the "Raúl Gómez García" Teaching Polyclinic.
Method: a descriptive, cross-sectional study was conducted. Theoretical approaches were used for document analysis and for systematizing relevant references; empirical methods included a survey to collect data on acute low back pain, direct observation of therapy administration in affected patients, and a diagnostic rubric to evaluate symptom severity.
Results: analysis of the diagnostic instruments and their methodological triangulation revealed the key challenges and enabling factors for applying combined magnetotherapy and rectal ozone therapy in patients with acute low back pain.
Conclusions: the identified obstacles and potentials formed the basis for developing a standardized protocol to guide the proposed combined treatment.

Keywords: Acute Low Back Pain; Ozone Therapy; Magnetotherapy.

RESUMEN

Introducción: el dolor lumbar forma parte de las afecciones que más se atienden en los centros de rehabilitación en el municipio "10 de Octubre" de La Habana, por lo que es necesario aplicar terapias que propicien la rápida recuperación de los pacientes que lo padecen.
Objetivo: diagnosticar el estado inicial para el empleo del tratamiento combinado con magnetoterapia y ozonoterapia rectal a personas con dolor lumbar agudo, que se atienden en el Policlínico Docente "Raúl Gómez García".
Método: se efectuó un estudio descriptivo y transversal, se aplicaron métodos teóricos para el análisis de documentos y la sistematización de referentes relacionados con el tema y métodos empíricos como encuesta que posibilitó obtener información sobre el dolor lumbar agudo; observación a la ejecución de las terapias relacionadas con el tratamiento a personas con dolor lumbar agudo; criterio diagnóstico, para valorar la severidad de los síntomas en las personas con dolor lumbar agudo.
Resultados: el análisis de los resultados de los instrumentos que se aplicaron para la valoración del

diagnóstico inicial y su triangulación metodológica, permitieron identificar los problemas y potencialidades para la aplicación del tratamiento combinado de magnetoterapia y ozonoterapia rectal a personas con dolor lumbar agudo
Conclusiones: los problemas y potencialidades que se identificaron permitieron la estructuración de un protocolo de actuación para la aplicación del tratamiento combinado que se propone.

Palabras clave: Dolor Lumbar Agudo; Ozonoterapia; Magnetoterapia.

INTRODUCTION

Neuromusculoskeletal problems encompass a range of congenital, traumatic, or pathological disorders of the musculoskeletal system that can cause impairments, ailments, and motor disorders, such as conditions affecting the lumbar region. Statistical studies conducted in recent years have determined that this symptom is more common in females, is more closely related to increasing age, and is the leading cause of disability. [1] Among neuromusculoskeletal conditions is low back pain, one of the leading causes of visits to emergency health services. According to the World Health Organization (WHO), this condition is one of the most common and prevalent diseases in the world.[2]

Low back pain is considered one of the main reasons for visits to emergency services. This condition is one of the most frequent and prevalent diseases in the world. Health centers provide constant care to patients suffering from this condition, which causes recurrent disabilities. This is also evident in the working-age population and has a high impact on public health costs.[3] To organize this health problem and review the available evidence for its proper management, the WHO published a guide to the management of low back pain.[4] For the above reasons, it is considered important to properly study this condition and control it adequately in order to reduce the consequences it has on the affected population and health systems.

At the Raúl Gómez García Teaching Polyclinic, problematic situations were identified in the use of combined physical agent therapies for the treatment of people with acute low back pain, which has a considerable incidence at this institution. The research objective is to diagnose the initial condition for the application of combined treatment with magnetotherapy and rectal ozone therapy to people with acute low back pain at the Raúl Gómez García Teaching Polyclinic.

METHOD

A descriptive, cross-sectional study was conducted between September and November 2024. Theoretical methods such as document analysis and systematization were applied, as well as empirical methods such as a survey of people with acute low back pain with their decision criteria for assessment, diagnostic tests to identify the affected nerve with their decision rule for assessment, observation of treatment, and statistical methods for processing the data obtained in the empirical investigations to identify the affected nerve.

Table 1. Survey decision criteria

Decision criteria	
If more than 60 % of the data collected falls within the sum of the SI and SOMETIMES normotypes, the following is assessed:	Problem
If the data collected is less than 59 % in the sum of the normotypes YES and SOMETIMES, the following is assessed:	Satisfactory

Inclusion criteria: selection of individuals with acute low back pain.
Exclusion criteria: diseases where the use of magnetotherapy or rectal ozone therapy is contraindicated.

Diagnosis of initial condition

Operationalization of the variable

The information was collected from a population of 30 people with acute low back pain who attended physical rehabilitation services between September and November 2024.

To perform the initial diagnosis of people with acute low back pain, the parameterization procedure is explained, and the results of each instrument applied are analyzed to arrive at an inventory of problems and potentialities.[5,6]

The following is identified as the sole variable: the rehabilitation process for people with acute low back pain using a combination of magnetotherapy and rectal ozone therapy.

Operationalization of the variable

Diagnostic dimension: identification of the symptoms and signs of people with acute low back pain.

1.1. Level: intensity of pain
1.2. Level: muscle weakness
1.3. Level: muscle stiffness
1.4. Level: peripheral nerve sensitivity
1.5. Level: difficulty maintaining correct posture
1.6. Level: difficulty performing daily activities
1.7. Level: intensity of inflammation
1.8. Level: intensity of discoloration

Dimension: procedural - rehabilitation: stage of rehabilitation treatment for people with acute low back pain.

2.1. Level: joint mobility acquired through therapy
2.2. Level: decrease in pain threshold
2.3. Level: recovery of affected nerve
2.4. Level: recovery to maintain correct posture
2.5. Level: recovery to perform daily activities
2.6. Level: intensity of inflammation
2.7. Level: intensity of discoloration

RESULTS AND DISCUSSION

The process of applying and analyzing the instruments is explained below.

The survey was conducted as a diagnostic tool for people with acute low back pain who attend the physical rehabilitation area of the polyclinic, with the aim of identifying the need for treatment with magnetotherapy and rectal ozone therapy.

Table 2. Survey of people with acute low back pain (diagnostic criteria)

No	Questions and Indicators	Normotypes		
		Yes	No	Sometimes
1	I feel intense pain in the lumbar region (1.1, 2.3)	30 (100 %)	0 (0,0 %)	0 (0,0 %)
2	I feel pain at rest (1.1, 2.2, 2.3)	10 (33,3 %)	0 (0,0 %)	20 (66,6 %)
3	I feel pain in my buttocks (1.1, 2.2, 2.3)	5 (50,0 %)	8 (26,6 %)	7 (23,3 %)
4	Pain spreads to the legs (1.1, 2.2, 2.3)	12 (40,0 %)	10 (33,3 %)	8 (26,6 %)
5	I feel stiffness in my lower back (1.3, 2.1)	10 (33,0 %)	0 (0,0 %)	20 (66,6 %)
6	I have difficulty performing everyday movements (1.1, 1.5)	30 (100 %)	0 (0,0 %)	0 (0,0 %)
7	I have difficulty maintaining correct posture (1.1, 1.4, 2.4)	20 (67,0 %)	0 (0,0 %)	10 (33,0 %)
8	I feel muscle weakness in my back (1.2)	15 (50,0 %)	5 (16,6 %)	10 (33,3 %)
9	I feel muscle weakness in my lower limbs (1.2, 1.4)	20 (66,6 %)	2 (6,6 %)	8 (26,6 %)
10	I have difficulty climbing stairs (1.6, 1.7)	10 (33,3 %)	0 (0,0 %)	20 (66,6 %)
11	I have difficulty standing (1.6, 2.4)	10 (33,3 %)	15 (50,0 %)	10 (33,3 %)

Analysis of survey results

The criteria observed in relation to pain, muscle and joint stiffness, muscle weakness, difficulties in performing activities of daily living, and maintaining correct posture were assessed as problems.

Table 3. Diagnostic test to identify the affected nerve

Nerves	Patient position	Test procedure	Pain threshold		
			Strong	Weak	No pain
Common peroneal	Supine, hands on abdomen. Positioned on the lateral edge of the examination table	Ankle and foot in plantar flexion, inversion, supination, toes in flexion, lower limb raised with knee extended, neutral hip position in relation to rotations	30 (100 %)	0 (0,0 %)	0 (0,0 %)
Tibial	Supine, with hands on abdomen. Positioned on the lateral edge of the stretcher	Ankle and foot in dorsal flexion, eversion, and pronation, toes extended, raise the lower limb with the knee extended in a neutral hip position, relationship with rotations	30 (100 %)	0 (0,0 %)	0 (0,0 %)

Sural nerve	Supine with hands on abdomen, placed on the lateral edge of the examination table	Ankle and foot in dorsiflexion, inversion, and supination, neutral hip position in relation to rotations, lower limb raised with knee extended	30 (100 %)	0 (0,0 %)	0 (0,0 %)
Femoral nerve	Lateral decubitus, cervical flexion, stabilize the lower limb with the hip in flexion	Extend the upper hip without lumbar extension, flex the knee	30 (100 %)	0 (0,0 %)	0 (0,0 %)
Lateral femoral cutaneous nerve	Lateral decubitus, cervical flexion, stabilize the limb below with the hip in flexion	The hip remains elevated and is extended and abducted, the pelvis is stabilized to prevent lumbar movement	30 (100 %)	0 (0,0 %)	0 (0,0 %)

Analysis of diagnostic test results to identify which nerve is affected by lumbar pathology

Table 4. Decision rule criteria to identify the affected nerve

Indicator	Based on criteria physiotherapist-patient
High	Feels severe, deep, stabbing pain, cannot perform the movement well
Medium	Feels mild, superficial pain, performs the movement with difficulty
Low	Little sensitivity to pain, superficial, can perform the movement, but with some difficulty

When performing this diagnosis on people with acute low back pain, nerve damage was observed based on the above decision rule and the consensus between therapist and patient.

Table 5. Treatment observation

No	Criteria according to observation	Observed	Not observed	Sometimes observed
1	Rectal ozone therapy treatments are performed	0 (0,0 %)	30 (100 %)	0 (0,0 %)
2	Magnetic therapy treatments are performed	0 (0,0 %)	10 (33,0 %)	20 (66,0 %)
3	Magnetic therapy and rectal ozone therapy are combined	0 (0,0 %)	30 (100 %)	0 (0,0 %)
4	Regulated frequencies are used	21 (70,0 %)	0 (0,0 %)	9 (30,0 %)
5	Regulated time is enforced.	21 (70,0 %)	0 (0,0 %)	9 (30,0 %)
6	Other combinations are performed	20 (66,0 %)	0 (0,0 %)	0 (0,0 %)
7	Other physical agents are used.	20 (66,0 %)	0 (0,0 %)	10 (33,3 %)

Analysis of treatment observation

At this stage of rehabilitation, the proposed combination of magnetotherapy and rectal ozone is not yet used. Few magnetotherapy treatments are performed, and other combinations with analgesic current are applied. Treatments are performed with the necessary time and frequency, but patient recovery takes longer.

Methodological triangulation results

Methodological triangulation allowed us to compare the information received from the instruments applied to identify coincidences and discrepancies in the phenomenon under study.[7] In comparing the results obtained, it was noted that the indicators related to pain were assessed as a problem, as were those related to stiffness and joint mobility. Therefore, dimension two related to diagnosis is assessed as a problem.

DISCUSSION

One of the priorities of public health is the care of people with low back pain due to its high prevalence and impact on economic and social costs. For this reason, protocols for the treatment of people who suffer from it must be improved.[4] In primary care, non-pharmacological treatment for low back pain should be prioritized. In addition, educational advice is proposed as the basis for the treatment provided by professionals in conjunction with the diagnosis. This advice is based on concepts that explain the patient's current situation and on the proposal of alternative treatments such as the use of physical agents.[8]

Low back pain is a syndrome with a high prevalence in the general population, affecting approximately

9,4 % of the global population. In addition, it is the condition that causes a considerable amount of disability worldwide, ranking sixth among the pathologies that cause the greatest disease burden globally.[9,10] Low back pain worsens with physical exertion and improves with rest.

Magnetic therapy is used for low back pain due to its sedative effect on the central and peripheral nervous systems. It also has a myoenergetic and spasmolytic effect on the muscular system, is anti-allergic, healing, and trophic.[11] Magnetic therapy based on acupuncture allows the recovery of motor activity in people with lower back pain. It also has anti-inflammatory and analgesic effects, stimulates the regeneration and healing of body tissues, and is an alternative treatment for acute and chronic diseases.[12]

Ozone therapy has antiviral, anti-inflammatory, antioxidant, and oxygenating effects on hypoxic tissues and is recommended to obtain these benefits. Ozone therapy via rectal insufflation in patients with acute infection or convalescing from COVID-19 has been shown to be a safe and effective treatment.[13] Ozone is also used for acute pain caused by neuralgia, recurrent headaches, migraine disorders, and in treatments for joint and muscle pain, such as conditions affecting the cervical and lumbar regions.[14] Due to these benefits, it is recommended for acute low back pain.

CONCLUSIONS

Based on the results obtained in the initial diagnosis of people with acute lower back pain who attended the rehabilitation services of the Raúl Gómez García Teaching Polyclinic, problems and potentialities were identified that contributed to the proposal and development of a protocol for combined treatment with magnetotherapy and rectal ozone therapy for these people.

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CONFLICT OF INTEREST

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