Multimodal protocol for the treatment of chronic headache. Case report

Protocolo multimodal para tratamento da cefaleia crônica. Relato de caso

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ABSTRACT

BACKGROUND AND OBJECTIVES: Chronic headache can be defined as a primary disorder that falls into four categories: migraine, tension-type headache, autonomic headache, and trigeminal headache. In rare cases, headaches can develop acute damage to both the micro-vessels and the white matter, which can shape foci of gliosis. In this case, the patient was diagnosed with chronic headache and had severe physical disability. Many treatments have been performed without achieving satisfactory control of the clinical condition. The objective of this study was to demonstrate the resolution potential of an interprofessional therapeutic proposal based on an interdisciplinary approach, which united Physical Therapy, Psychology, Physical Education, and Nutrition in the treatment of chronic headache.

CASE REPORT: Female caucasian patient, with chronic headache for 14 years, with early progressive gliosis and rare T2 lesions with hypersignal in the supratentorial white matter. The protocol, planned in an articulated manner between the professionals, included dry needling and laser on the frontal, temporal, and masseter muscles during the physical therapy sessions, psychological care with relaxation techniques, guided imagery, meditation, and biofeedback, nutritional counseling based on the anamnesis with a 24-hour recall that guided the correct distribution of macro and micronutrients, as well as a resistance training for 12 weeks (three times a week) of resistance and aerobic exercises, and a 12-week follow-up after the intervention.

CONCLUSION: The program of the proposed protocol proved to be safe and effective in the treatment of chronic headache, with results that were maintained after the intervention.

Keywords: Chronic pain, Headache, Interdisciplinarity.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A cefaleia crônica pode ser definida como um distúrbio primário, que se enquadra em quatro categorias: enxaqueca, cefaleia do tipo tensional, cefaleia autonômica e cefaleia trigeminal. Em casos raros, as cefaleias podem desenvolver lesões agudas nos microvasos e na substância branca, que podem formar focos de gliose. No caso aqui relatado, a paciente foi diagnosticada com cefaleia crônica e apresentava incapacidade física grave. Muitos foram os tratamentos realizados sem se obter um controle satisfatório da sua condição clínica. O objetivo deste estudo foi demonstrar o potencial resolutivo de uma proposta terapêutica interprofissional fundamentada em uma abordagem interdisciplinar, que uniu Fisioterapia, Psicologia, Educação Física e Nutrição no tratamento da cefaleia crônica.

RELATO DO CASO: Paciente do sexo feminino, caucasiana, com cefaleia crônica há 14 anos, com gliose progressiva precoce e que apresentou lesões raras com hipersinal em T2 na substância branca supratentorial. O protocolo, planejado de maneira articulada entre os profissionais, incluiu agulhamento a seco e 'laser' nos músculos frontal, temporal e masseter durante atendimentos com a fisioterapia, atendimento psicológico com técnicas de relaxamento, imagens guiadas, meditação e *biofeedback*, uma orientação nutricional que partiu da anamnese com recordatório de 24 horas, que orientou sobre a correta distribuição de macro e micronutrientes, além de um treinamento resistido por 12 semanas (três vezes por semana), com exercícios resistidos e aeróbicos e um acompanhamento de 12 semanas após a intervenção.

CONCLUSÃO: A aplicação do protocolo proposto mostrou-se segura e eficaz no tratamento da cefaleia crônica e com resultados que se mantiveram após a intervenção.

Descritores: Cefaleia, Dor crônica, Interdisciplinaridade.

INTRODUCTION

Headaches affect approximately 90% of people throughout their lives[1]. Chronic headache is a persistent headache condition, often accompanied by severe comorbidities such as chronic fatigue, depression, anxiety, and insomnia, conditions that together are difficult to treat[2]. In rare cases, headaches can result in acute injury to micro-vessels and white matter, leading to the formation of gliosis foci[3], a simplified form of the central nervous system

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HIGHLIGHTS

- This is a case of a patient with chronic headache and severe physical disability.
- An interdisciplinary and interprofessional approach was used and resulted in satisfactory pain control.
- The multimodal therapy protocol represented a safe and effective alternative for the treatment of chronic headache in this case.

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healing process in regions of the white matter with axonal damage and glial proliferation[3].

Chronic headache, which affects about 46% of the adult population, can lead to severe disability and cause important psychosocial effects, including absenteeism, low self-esteem, difficulties in relationships with family members, worsening quality of life, maintenance and development of chronic pain syndromes[4,5]. In the World Health Organization's ranking of disability causes, chronic headache is among the five major conditions of disability in women, with great incapacitating power in daily life[5].

In this case study, an intervention protocol was presented based on an interdisciplinary approach and developed in an interprofessional manner, involving professionals from Physical Therapy, Physical Education, Nutrition, and Psychology. The interprofessional work was chosen to approach the high complexity case[6] of a patient with chronic headache, without a clearly identifiable cause, with limitation to treatment, combined with undesired results and frustration of her expectations.

In this sense, the present study sought to show that the proposed protocol, based on an interdisciplinary approach carried out by an interprofessional team, was potentially beneficial in the treatment of chronic headache.

CASE REPORT

The CARE Guidelines (CAse REports) were used for drafting the manuscript, increasing its accuracy, transparency, and usefulness[7].

Female patient, 42 years old, married, mother of two children, with a history of chronic headache, depression and anxiety. In October 2021, the patient contacted a healthcare facility (VCD) for the first time and, in her initial consultation, she reported that her headaches began in adolescence, a period when she lived in the rural area and worked in farming.

Main questions/symptoms and clinical findings

At the time of the consultation, the patient was agitated, distressed, introspective, and had difficulty expressing herself. She reported frequent and excessive use of drugs without consequent improvement of the clinical condition. She also stated that started treating her headache in 2008, when her doctor prescribed aspirin, paracetamol, and anti-inflammatory drugs. This therapy led to an improvement in the clinical scenario, with a reduction of the crises for a period of approximately two months, after which the manifestations returned, even with the use of drugs. Over time, the pain became even more intense, even with the increase of drugs, which included weak opioids prescribed for moderate pain and strong opioids in the most intense crises.

Diagnostic Assessment

From the initial consultation performed by a physical therapist in 2021, data on drug use, eating habits, muscle sensitivity assessment (masseter, occipital, frontal, and temporal), everyday behaviors, and the level of physical activity were collected.

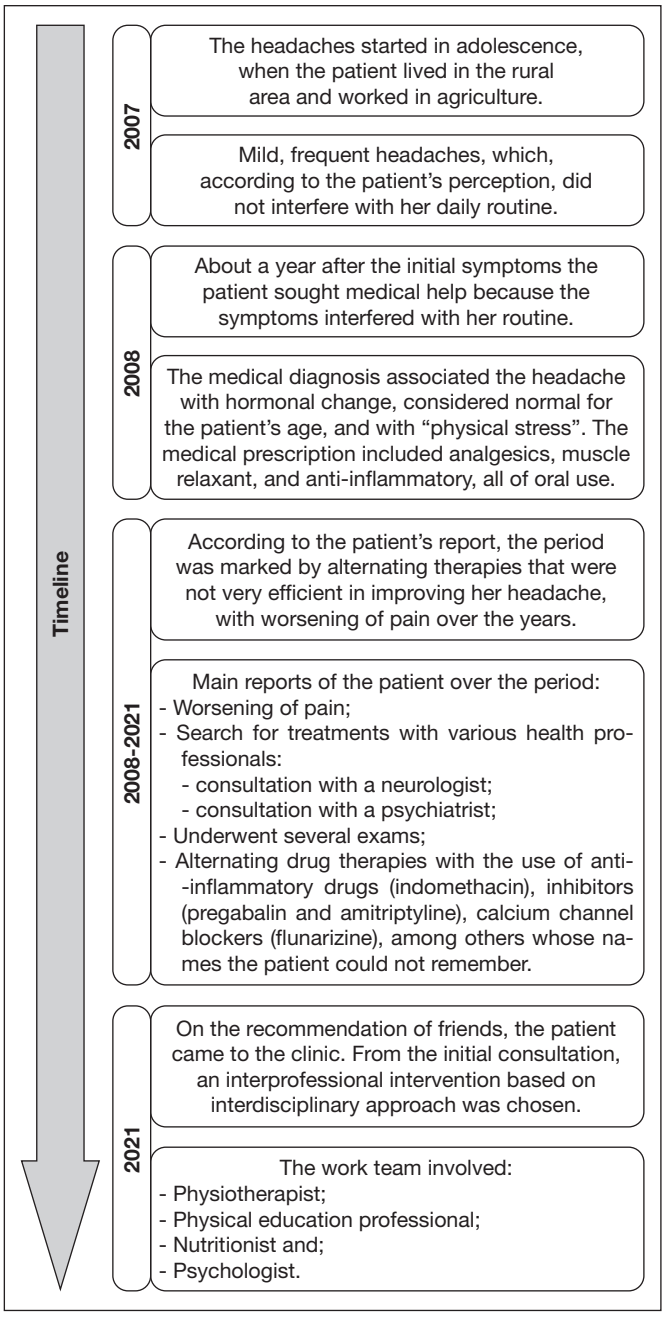

Figure 1. Timeline

Before starting the intervention protocol, the patient confided that this would be her last attempt at treatment. She was quite afraid of the result that was presented in her last MRI scan, which showed rare sparse hypertensive foci in the brain white matter (Figure 2), called gliosis foci.

At the time of the consultation, the patient was using pregabalin 75 mg, flunarizine dihydrochloride, amitriptyline, and varivax. The physical examination included: blood pressure; palpation of the sinuses; palpation of the neck, skull, masseter, occipital, frontal and temporal muscles, observing the structure and function of these muscles and trigger points.

The symptoms reported by the patient included pain radiating down the arm that intensified in the cervical region, more on the left side of the face, and also reported paresis and loss of function in the left upper limb. In addition, the patient was referred for consultation with a psychologist and for nutritional and physical activity level assessment.

During the psychological consultation, it was found that the patient's life history contributed substantially to the condition, with the presentation of data on her environmental context. Family variables pointed to the existence of conflict, suggesting a history of modeling for pain behavior, in addition to possible associated family heritage. Besides the family report, the patient presented aspects of positive social reinforcement for addictive behaviors and pain manifestations.

The data collected in the nutritional consultation pointed to the need to avoid foods that trigger pain (cheese, sausages, soy-based sauces, caffeine, mate, soft drinks, fried food, stuffed cookies, and fatty meats), as well as to replace vitamins and nutrients that were not being properly consumed in the patient's diet, causing deficiency and helping to perpetuate the pain cycles. Another element pointed out in the patient's diet was the fasting time, also corrected in the nutritional performance.

With the physical education professional, evaluation and pre-participation in the exercises were performed, gathering data on personal health history (surgeries, fractures, hospitalizations), current habits, family history, current level of physical activity, and sedentary behavior. The specific tests were of one repetition maximum (1RM) for the lower and upper limbs, involving familiarization with the pain and fatigue scales. During the exercise phase, the pain and fatigue scores could not exceed the pre-intervention condition by more than two points.

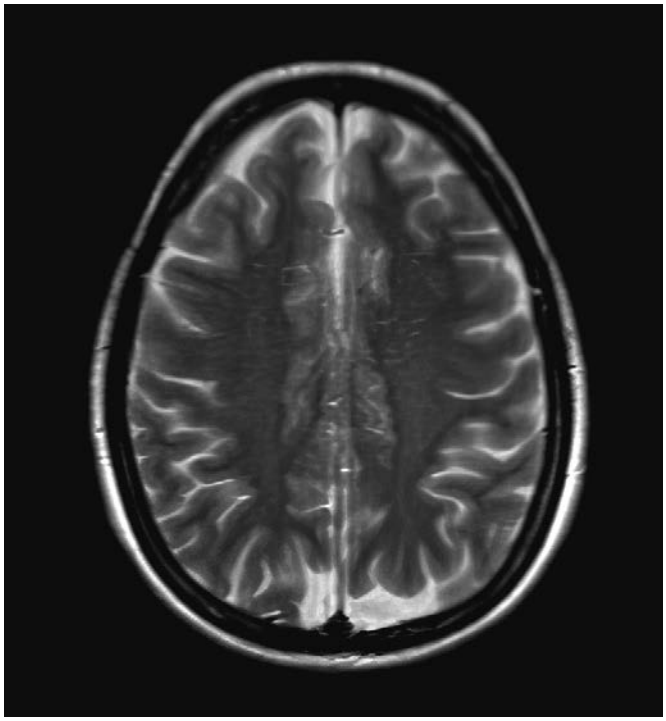

Figure 2. Gliosis foci

Therapeutic intervention

From the initial diagnosis, an interprofessional team developed a work plan based on an interdisciplinary approach. The planning allowed the integration of services, with appointments three times a week for 12 weeks. In the physiotherapeutic approach, the procedures performed consisted of using the dry needling technique on the temporalis, masseter, frontal and corrugator muscles, bilaterally, with more applications on the left hemi face. Additionally, the laser (Therapy XT®, Santo André, São Paulo) was used as photobiostimulator, for not having side effects and not being invasive. A rate of 6J/60 sec/cm^2 was applied in the same muscles that were treated with the dry needling technique.

After the nutritional assessment, which included an anamnesis, with a 24-hour recall, the patient was oriented in relation to the nutritional factors that are most related to chronic headaches, having as reference an academic study[8]. In general, besides the guidance on the correct distribution of macro and micronutrients in the diet, the recommendations aimed at eliminating or considerably reducing the intake of stimulants, especially alcohol, coffee, mate, simple sugars, and industrialized products. In addition, a low-fat diet was prioritized, with increased intake of fruit and water.

During the psychological follow-up, the patient had one appointment a week for 12 weeks, lasting 50 to 60 minutes. The technique used was Cognitive Behavioral Therapy (CBT). Relaxation techniques were taught through diaphragmatic breathing, guided imagery, and meditation on the patient's everyday events. A set of techniques was used to increase the ability of voluntary control of physical responses, called biofeedback. The technique consists in the observation of psychological signals and instructions for certain situations, obtaining control over the organism, aiming at its regulation. According to a scientific study[9], in the context of chronic pain treatment, CBT is a method capable of correcting cognitive beliefs and distortions that can alter and even increase pain perception.

The physical exercise protocol was planned and monitored by a physical education professional with experience in patient follow-up. Before starting each exercise session, the patient wrote down her pain and tiredness with scores between zero and 10. For monitoring pain and tiredness, the Visual Analogue Scale[10] and the Borg Scale[11] were used, respectively.

The pain and fatigue scores assessed at rest (before each exercise session) were used as a reference to control training loads. Exercise was interrupted whenever pain and fatigue scores increased by 2 points in relation to rest. The protocol consisted of 12 weeks of resistance and aerobic exercises, performed three times a week. Each session consisted of a 10-minute warm-up on a horizontal bicycle ergometer (Bike Horizontal H2 Movement®, Pompeia, São Paulo), followed by squatting exercises, "sit/stand" on a bench, leg press flexion and extension, and unilateral elbow flexion and extension in the standing position on the equipment (Cross Over Line TRG®, Blumenau, Santa Catarina). The loads were adjusted to the number of series and repetitions prescribed in each phase and the perception of pain and fatigue was used for monitoring, as already described.

RESULTS

The primary outcome of this study was the pain relief during the 12-week intervention period. The initial pain, which scored 10 out of 10, was reduced by 18% in the first 20 visits, and by an average of 6.8% throughout the treatment, with the final presentation varying between two and three points, as shown in figure 3.

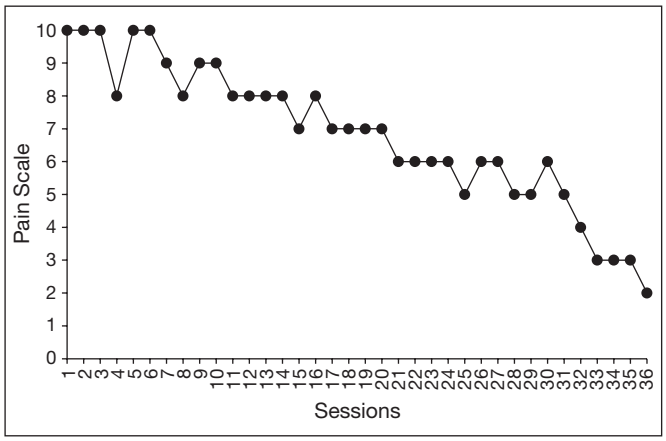

Figure 3. Evolution of pain throughout the 12-week intervention, measured using the Visual Analog Scale

The satisfaction with the treatment from the patient's perspective was evaluated through the Questionnaire of Perceived Changes (QPC), with the options: "worse", "no change" or "better than before". The following items were answered as "better than before": personal problems, mood, stability of emotions, self-confidence, interest in life, ability to endure difficult situations, appetite, sleep, physical health (pain, tremors, etc.), sexuality (sexual satisfaction), living with family, friends and other people, interest in work, leisure activities, homework, ability to fulfill obligations and make decisions. The item "your energy" was the only one that had "no change" as an answer.

DISCUSSION

Based on the results presented in this study, the proposed intervention protocol can be used to reduce pain intensity and improve patient satisfaction in relation to the proposed criteria. The literature shows progress in the management of chronic headache[12]. However, historically, methods have been defined by expert opinions based on limited evidence[13], which, according to the American Headache Society (AHS) guidelines, makes a standardized approach necessary to optimize treatment success[13]. There is no consensus about the best treatment for each type of headache, especially about a treatment that takes into account individual complaints.

The protocol, over the 12 weeks of intervention, showed positive effects on pain reduction. Some factors that hinder the treatment of patients with headache were also identified. Among them stand out self-medication that, according to a study[13], results in little or no effect; and the suspension of the use of drugs prescribed by the doctor for the treatment of pain, such as pregabalin, paracetamol, flunarizine dihydrochloride, and varivax.

In this sense, the main objective of the intervention recommendations for the report in question was pain improvement. The second objective was to demonstrate the achievement of this improvement through the interdisciplinary protocol. The protocol was effective throughout the 12-week intervention, which may have contributed to patient compliance during treatment. Some barriers that hinder the treatment of people with headache were also identified, such as when the patient stopped taking all the drugs directly related to relieving the pain and those associated with pain.

The effects of treatment were observed in the first week and over the following 12 weeks. During the initial phase, dry needling may have helped relieve pain, as described in a recent systematic review on the effectiveness of dry needling in headaches[14]. However, this should not be considered as the only effective action, since it is an intervention based on inter-professionalism. In this sense, dry needling alone is not supported by evidence, which suggests more robust approaches[15].

Although the results of photobiostimulation (laser) in the treatment of pain are still inconclusive[16], the objective of the present study was to use it as an adjuvant, considering its potential anti-inflammatory effect[17]. Another evaluation of the effectiveness of this technique showed clinical results against pain in patients with primary headache, despite the inconclusive evidence[17].

The psychological follow-up was aimed at reducing the frequency of pain episodes, voluntarily controlling the physical responses that can aggravate it, in addition to minimizing the emotional factors, helping the patient to live with the crises in the best possible way. In this sense, CBT explored three related areas: 1) the cognitive part: what is her pain, what is real and what is not; 2) the gradual exposure to the perpetuating stimuli; 3) daily life and behavioral change. According to one study[18], this strategy can also be used to treat other chronic pain conditions such as low back pain, and can lead to significant and lasting improvements in these clinical conditions.

The focus of the nutritional approach was to provide a balanced diet and the elimination of foods that potentially worsen pain. In the case of the patient in question, cheese, chocolate, citrus fruits, alcohol, coffee, bad carbohydrates, and processed products were excluded from her diet.

It is known that the exercises that are potentially beneficial for most clinical conditions are those performed at moderate to high intensities[19]. Considering that exercise, acutely, can also induce hyperalgesia and that fatigue can potentiate this effect[20], the assessment of pain perception and fatigue during each training session is an efficient strategy to adjust the training overload and minimize hyperalgesia induced by exercise. Thus, the proposed protocol could be carried out uneventfully over the 12 weeks of intervention and allowed the patient to maintain a regular practice of physical exercises after discharge, maintaining the results obtained in the intervention for at least 12 weeks, when she was reassessed.

The choice to use strategies based on the control of fatigue and pain had, as a main objective, not to increase the pain scenario

by the potential of fatigue and increased pain during exercise on the sensitization of neurokinin subunits (1) in the N-methyl-D--aspartate (NMDA) receptors, in the ventromedial region of the medulla[20].

CONCLUSION

The multimodal and multidisciplinary approach presented in this case study proved to be safe and effective for the treatment of chronic headache, with positive impacts on the patient's life, thus highlighting the clinical relevance of interdisciplinary and interprofessional work in cases of chronic headache.

AUTHORS' CONTRIBUTIONS

Fernando Schorr Grossl
Statistical Analysis, Data Collection, Resource Management, Project Management, Investigation, Methodology, Writing - Manuscript Preparation, Writing - Proofreading and Editing, Software
Samuel Spiegelberg Zuge
Statistical Analysis, Conceptualization, Methodology, Writing - Preparation of the Original, Writing - Review and Editing, Validation
Sedinei Lopes Copatti
Funding Acquisition, Data Collection, Writing - Preparation of the Original
Clodoaldo Antônio de Sá
Methodology, Writing - Review and Editing, Supervision, Validation, Visualization

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