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EFFECT OF THIELE MASSAGE AND TRANSCUTANEOUS ELECTRICAL STIMULATION ON QUALITY OF LIFE AND PHYSICAL SYMPTOMS IN WOMEN WITH ENDOMETRIOSIS: A RANDOMIZED CLINICAL TRIAL

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Abstract: Introduction: Endometriosis is a chronic disease capable of drastically interfering with women's quality of life. Available treatments fail to manage pain and improve patients' quality of life. Despite being a growing variable in studies, there is a shortage of alternative techniques for managing pain and improving quality of life. Objective: To evaluate the effect of Thiele massage and transcutaneous electrical stimulation on quality of life and physical symptoms in women with endometriosis through a randomized clinical trial. **Methodology:** a total of 21 volunteers participated in 3 intervention groups. In G1 there was application of Thiele massage, in G2 there was application of transcutaneous electrical stimulation and in G3 there was a combination of both techniques. Assessments were measured using the Visual Analogue Pain Scale and the questionnaire: *Endometriosis Health Profile Questionnaire-30*. **Results:** For quality of life there was a significant improvement ($p \leq 0.05$) in the 3 intervention groups; diffuse abdominal pain, pain on vaginal palpation and the presence of trigger points, a statistical improvement was found only in G1 and G3; pain during sexual intercourse achieved a statistical improvement of 100% in G1 and G2. Conclusion: Electrical stimulation and Thiele massage resulted in a better assessment of quality of life in patients with endometriosis, with no difference between the techniques. Thiele's massage improved physical symptoms related to endometriosis. Electrostimulation was not able to obtain statistical improvement in physical symptoms, only in pain during sexual intercourse. The combination of the two techniques improved abdominal and vaginal pain, but did not improve strength or pain during sexual intercourse.

Keywords: Endometriosis, Chronic pelvic pain, Physiotherapy, Thiele massage, Electrostimulation.

INTRODUCTION

Endometriosis is characterized by a chronic inflammatory disease [1], and presents as a painful disorder[2] accompanied by adhesions and anatomical deformities which are related to chronic pelvic pain (CPP) and infertility.[1] It affects approximately 10% of women, who are diagnosed at reproductive age.[2] The main manifestations are dysmenorrhea, chronic pelvic pain, profound dyspareunia, dyschezia and dysuria.[3,4]

CPP is characterized by non-cyclical and non-menstrual pain, located in the lower portion of the abdomen and lasting at least 6 months, with continuous or intermittent symptoms, which is not related to sexual pain.[5] In addition to the clinical manifestations already mentioned, psychological symptoms such as anxiety and depression are prevalent in women with endometriosis. Problems related to relationships are also recurrent, since, due to pelvic pain, there is a decrease in the frequency of sexual intercourse, which in many cases ends up leading to divorce due to the partner's misunderstanding. Given the countless repercussions in the life context of this population, there has been a growing interest in discovering new tools to combine with the medical treatment of this condition.[3]

In addition to clinical diagnosis, laparoscopy is indicated as the gold standard for diagnosing Endometriosis, however it is known that around 60% of women with CPP have never received a correct diagnosis, and around 20% are even subjected to an investigation for the pain picture presented [5]. In this context, women experience a delay of 7 to 12 years from the onset of pain symptoms to surgical diagnosis and this delay is even greater for patients seeking concomitant treatment for infertility and CPP. All this difficulty in accessing the correct diagnosis not only leads to ineffective treatments for this condition, but also affects the quality of life of these women in their social and personal aspects. Partially, this is due to the requirement for a surgical laparoscopy exam to confirm the diagnosis 5 and untrained health professionals, who in many cases trivialize and normalize self-reported pain and severity in women. [6]

There are currently no curative treatments for DPC [6], therefore, first-line treatment options are restricted to surgical incisions and hormonal therapies, which can offer positive results in controlling the extent of the disease, but are still ineffective in controlling pain.4 All of these approaches focus on the treatment of ectopic lesions of the endometrium, in turn not intervening in the mechanisms of central sensitization and myofascial pain secondary to active myofascial trigger points (i.e., spontaneously painful) which are probably a source of initiation, amplification and perpetuation of the pain even after surgery. [7]

Furthermore, it is important to highlight that endometriosis itself is also refractory to these conventional treatments, causing many frustrations for patients who resort to these resources in an attempt to minimize their pain. It is noteworthy that the rate of recurrent pain after surgical intervention reaches 30%, corresponding to a total of 2 million women worldwide who do not have access to specialized treatment centers, highlighting the urgent need for new methods, techniques and alternative practices that help control and reduce pain.

Although endometriosis is a relevant and extremely current topic in the women's health scenario, we know that the literature is still very scarce regarding the physiotherapeutic approach to this condition, which makes it necessary and urgent to expand our knowledge regarding the applicability of non-invasive resources, such as Thiele massage and transcutaneous electrical stimulation as allies in the treatment of this condition.

Thus, the present study aimed to

evaluate the effect of Thiele massage and transcutaneous electrical stimulation on quality of life and physical symptoms in women with endometriosis.

MATERIALS AND METHODS

This is a randomized, experimental, explanatory, prospective longitudinal clinical trial, approved by the local institutional Ethics Committee.

First, an invitation to women to respond to an online questionnaire (Appendix 1) was widely publicized on social media, which collected data on age, body mass index, history of pathologies and medical diagnosis, current hormonal therapies, previous surgeries, frequency and satisfaction. of sexual activity. Based on the responses, women with an active menstrual period between 18 and 50 years of age, with a confirmed diagnosis of endometriosis and symptoms of chronic pelvic pain were included, for convenience. Those who had undergone previous physiotherapy treatment for the same purpose, those who had a history of genital malignancy, a history of pelvic organ prolapses, a history of previous surgery in the abdominopelvic region and those who did not agree to sign the Informed Consent form were excluded. according to resolution 466/2012 of the National Health Council (Annex 2).

A total of 21 women with endometriosis were eligible for the study and were evaluated and treated at ``Clínica Escola Doutor Cícero Brandão`` in Ubá – MG or at the patient's home, preserving the guarantee of no changes in the results in any of the research environments.

In the first consultation, the Endometriosis Health Profile Questionnaire-30 (EHP-30)8 questionnaire (Appendix 3) was administered to assess quality of life. The questionnaire consists of two parts, the first of which is divided into 5 domains (pain, control and impotence, emotional well-being, social support and self-image) containing 30 questions applied to all women. The second part is modular and contains 6 domains (work, relationship with children, sexual relations, medical relationship, treatment and infertility), made up of 23 questions which do not necessarily apply to all women. Each question ranges from 0 (never) to 4 (always), so that the minimum number of points achieved would be zero (indicating the best state of health) to 212 (indicating the worst state of health). Next, there was a physical assessment (Appendix 4) through vaginal and abdominal palpation to quantify pain, trigger points and muscle strength. Palpation was performed by dividing the abdomen into 4 quadrants and palpating the regions to identify painful discomfort. During vaginal palpation, we divide the 4 quadrants by viewing the clock and applying pressure to the vaginal wall to identify pain points. To quantify pain, we use the Visual Analogue Scale (VAS), which varies from 0 to 10, where 0 means no pain and 10 refers to maximum pain; The trigger points were evaluated using the deep sliding technique during vaginal palpation and quantified according to their presence in the vaginal wall (0-10), and finally the muscular strength of the pelvic floor using the Modified Oxford Scale, which ranges from 0 to 5, where 0 means no contraction and 5 means strong contraction. The evaluations were carried out by a single evaluator to avoid bias in the work.

After the evaluation, the patients were randomly divided into three groups: In G1, they underwent Thiele massage, lasting 10 minutes, which consists of posterior digital pressure with stretching of the muscles [1]. In G2, they underwent transcutaneous electrical stimulation in the sacral region (S4-S5), frequency of 85Hz, pulse duration of 75μs, intensity adjustable to "comfortable strong" and duration of 30 min[1]. In G3,

they underwent a combination of the two interventions simultaneously. All participants underwent 15 consultations, twice a week. At the end, the participants were re-evaluated by the same initial evaluator.

For statistical analysis, data were entered into Microsoft Excel (2010) and analyzed using STATA software (version 13.0). Initially, all variables were tested for normality using the Shapiro Wilk test and homogeneity using the Levene test. For data analysis, descriptive analysis was used with mean and standard deviation for quantitative variables and absolute and relative frequency for qualitative variables.

To compare proportions between qualitative variables, Fisher's Exact Test was used. The Kruskall Wallis test was used to compare means between groups and the Wilcoxon test was used to evaluate the effectiveness of the protocol, before and after treatment. The level of significance adopted was $\alpha = 0,05$.

RESULTS

When characterizing the sample, most participants were married, used a hormonal contraceptive method to control symptoms, did not have nutritional monitoring, were not diagnosed with infertility and the symptoms began more than 18 months ago. There was no statistical difference in the sample characterization between the groups. (Table 1)

When we assessed quality of life according to the EHP-30 questionnaire, we observed that there was a significant improvement ($p \leq 0.05$) in the 3 intervention groups, but with no difference between them. (Table 2)

In table 3, when evaluating the physical symptoms related to diffuse abdominal pain, pain on vaginal palpation and the presence of trigger points, there was a statistical improvement only in G1 and G3 with the treatment; muscle strength statistically improved only in G1 and pain during sexual intercourse achieved a statistical improvement of 100% in G1 and G2. However, there was no statistically significant difference between the groups.

DISCUSSION

The present study aimed to evaluate the effect of Thiele massage and transcutaneous electrical stimulation on quality of life and physical symptoms in women with endometriosis.

The general characterization of the sample proved to be homogeneous since the majority of participants had an average age of 32.1 years, were married, used hormonal contraceptives to control symptoms and diagnose infertility, were sedentary, did not have nutritional support and they had a prolonged period of time between the onset of symptoms and pain. Although not the subject of our research, the profile of women with endometriosis in this study portrays the social barriers to be overcome, as many of them tend to endure the pain for more or less 2 years before seeking treatment, plus there is still the barriers related to the lack of training of health professionals in diagnosis and therapy, thus perpetuating the patient's painful symptoms for a long time through ineffective treatments.

When we evaluate quality of life, we see improvements in all groups.

Mira *et al.*[4] in a study with 22 women with endometriosis showed a significant improvement in general symptoms and quality of life through the application of transcutaneous electrical nerve stimulation alone, corroborating our findings. Nonetheless, Del Forno *et al.*[1] in a study carried out with 10 women diagnosed with endometriosis and monitored by Transperineal ultrasound, they did not observe any improvement in quality of life with Thiele's massage. This finding

Variables	Group 1	Group 2	Group 3	p-value
Age (years), Average (DP)	37,4 (± 5,3)	29,1 (± 6,9)	29,8 (± 6,2)	0,79*
Marital status, N (%)				
Single	1 (14,3%)	2 (28,6%)	3 (42,8%)	0,67#
Married	6 (85,7%)	5 (71,4%)	4 (57, 2%)	
Hormonal method, N (%)				
The patient does not use it	3 (42,8%)	1 (14,3%)	1 (14,3%)	0,37#
The patient uses it	4 (57,2%)	6 (85,7%)	6 (85,7%)	
Nutrition, N (%)				
No	6 (85,7%)	5 (71,4%)	4 (57,2%)	0,19#
Yes	1 (14,3%)	2 (28,6%)	3 (42,8%)	
Physical exercise, N (%)				
No	4 (57,2%)	3 (42,8%)	5 (71,4%)	0,22#
Yes	3 (42,8%)	4 (57,2%)	2 (28,6%)	
Infertility, N (%)				
No	4 (57,2%)	6 (85,7%)	6 (85,7%)	0,13#
Yes	3 (42,8%)	1 (14,3%)	1 (14,3%)	
Pain realized, Average (DP)	7,4 (± 2,7)	6,7 (± 2,7)	7,3 (±3,1)	0,59*
Period of pain (months), Average (DP)	89,4 (±104,3)	89,7 (±116,0)	134,6 (±92,8)	0,09*
Onset of symptoms, N (%)				
0 – 6 months	--	1 (14,3%)	--	0,27#
6 – 18 months	1 (14,3%)	--	--	
18 – 24 months	6 (85,7%)	6 (85,7%)	7 (100%)	

Table 1: Characterization of the sample profile of women with endometriosis, according to treatment groups. Ubá, 2022.

It means p-value in Fisher's Exact test; * means p-value in the Wilcoxon test; SD: Standard deviation; N: sample number

Variables	Group 1	Group 2	Group 3
Quality of life, average (DP)			
Before	96,6 (± 50,4)	102,4 (± 30,4)	99 (± 50,1)
After	19,4 (± 20,1) *	39,8 (± 25,3) *	23,1 (± 22,5) *

Table 2: Quality of life assessment according to the EHP-30 questionnaire before and after treatment. Ubá, 2022.

* it means p-value ≤ 0.05, in the Wilcoxon test | SD: Standard deviation

Variables	Group 1	Group 2	Group 3
Diffuse abdominal pain, Average (DP)			
Before	12,1 (±10,3)	10,7 (± 11,8)	12 (± 7,0)
After	2,0 (± 2,1) *	2,6 (± 2,6)	3,7 (± 2,9) *
Pain on vaginal palpation, average (DP)			
Before	16,8 (± 10,7)	7,3 (± 8,2)	17,7 (± 10,8)
After	1,3 (± 1,9) *	0,7 (± 1,2)	2,7 (± 1,9) *
Presence of *trigger point*, average (DP)			
Before	1,0 (± 0,8)	0,8 (± 0,9)	1,8 (± 1,7)

After	0,0*	0,4 (± 0,8)	0,5 (± 1,1) *
Muscle strength, average (DP)			
Before	2,1 (± 1,8)	1,7 (± 0,7)	2,7 (± 1,1)
After	2,8 (± 1,7) *	2,1 (± 0,9)	3,1 (± 0,9)
Pain during sexual intercourse, N (%)			
Before	6 (85,7%)	4 (57,2%)	2 (28,6%)
After	--	--	1 (14,3%)

Table 3: Assessment of physical symptoms of endometriosis before and after treatment. Ubá, 2022.

* it means p-value ≤ 0.05, in the Wilcoxon test; SD: Standard deviation; N: sample number

can be justified by the use of a self-reported questionnaire to assess QoL in this population, unlike our study, which chose to apply a validated instrument for this condition, the EHP-30.[8]

When analyzing the physical symptoms reported by patients in the study results, we noticed a statistical improvement in diffuse abdominal pain and vaginal pain only in the groups that received Thiele's massage and no difference in the group that underwent only transcutaneous electrical stimulation. Although Mira et al.4 pointed out a significant improvement in pain after the application of electrical stimulation in endometriosis, our study did not observe an improvement in the symptoms evaluated. Klotz et al.9 and Aredo et al.7 concluded that trigger point therapy and Thiele massage showed superior results to other techniques by demonstrating positive results in the patient's painful myofascial syndrome. These data support our findings in that myofascial syndrome may not necessarily cause latent pain, but may limit movement and develop muscle weakness. Therefore, inhibiting this painful reflex resulting from myofascial syndrome is important to obtain significant improvement in pain symptoms and trigger points in the abdominopelvic muscles.5

When we evaluate the variable muscle strength, we observed an improvement only in the Thiele massage group, a fact that can be justified by the indirect effect of the massage that acts on myofascial dysfunctions, by reducing muscle tension and promoting the release of trigger points, in turn normalizing the length. and stretching the fiber, thus favoring better contractile capacity. Based on this assumption, the improvement in strength in group 1 is justified, in which the recovery of myofascial function corresponded to the recovery of tissue contractility and consequent improvement in muscle strength.7

Pain during sexual intercourse can be present before, during or after sexual intercourse, negatively influencing women's physical and mental health, with important repercussions on their personal and interpersonal relationships. In our study, we obtained a 100% improvement in pain in groups 1 and 2. The study by Del Forno et al.1 mentioned above shows that Thiele's massage improved sexual function and dyspareunia after 5 sessions of 30 minutes each. In a systematic review of complementary interventions to treat pain in women with endometriosis, acupuncture was identified as an effective method for improving pain. However, the review presents a set of approaches that showed a tendency to improve pain during sexual intercourse, including Thiele's massage.3 A narrative review demonstrated satisfactory results for female painful sexual disorders with the application of various methods, including transcutaneous electrical stimulation. The analgesic effects of electrical stimulation are related to a mechanism of "closing the entrance" in the

dorsal columns of the spinal cord and may also be associated with the release of endogenous opioids, since when using a strong intensity level of electrical stimulation, there will be induction of the release of these substances at the brain and spinal level determined the sedative effect on peripheral nerves, data that confirm and support the effect of this resource as an adjuvant in the treatment of pain.10

Group 3, despite having been subjected to both resources, did not show an improvement in strength and pain during sexual intercourse as expected, just as Group 2, in turn, only improved pain during sexual intercourse, these inconsistencies in the findings suggest a limitation of the study with regard not only to the sample size, but the heterogeneity of the groups and the lack of control for the pain time variable in the assessment between groups for greater reliability of the results.

CONCLUSION

Electrostimulation and perineal massage resulted in a better assessment of quality of life in patients with endometriosis, with no difference between the techniques. Thiele's massage improved physical symptoms related to endometriosis. Electrostimulation was not able to obtain statistical improvement in physical symptoms, only in pain during sexual intercourse. The combination of the two techniques improved abdominal and vaginal pain, but did not improve strength or pain during sexual intercourse.

It is hoped that this preliminary study can guide new future research on endometriosis in the area of Pelvic Physiotherapy, based on the premise of a more significant sample value and greater rigor regarding the control variable, time of pain in this condition, in order to offer the possibility of an effective and safe that results in effective control of symptoms and improvements in the quality of life of this population.

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