Original Article

Evaluation of Electromagnetic Therapy in the Treatment of Severe Dysmenorrhea in Young Women of Basrah

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Abstract

Introduction: Primary dysmenorrhea (PD) is a public disease of young female worldwide, it affects their daily performances. Severe recurrent uterine cramps are the main complaints in 90% of adolescents and 50% of reproductive-age females. This study aimed to evaluate the use of magnetic field therapy in the treatment of severe dysmenorrhea grade 3 and provide an encouraging goal to continue daily work without pain. **Methods:** Two hundred and fifty female patients were recruited in this study from gynecological clinics in Basrah, southern Iraq. All had severe dysmenorrhea, patients were subjected to a questionnaire form, Visual Analog Scale, and verbal multidimensional scoring system to determine the pain intensity and grade of dysmenorrhea. Only 38 young females had severe dysmenorrhea grade 3 with ages ranging from 16 to 28 years with a mean age of 22.04 ± 1.43 years and body mass index 23.81 ± 1.94, patients subjected to electromagnetic field therapy (EMFT), two sessions per week for 20 min each for 6 weeks. Three categories were assessed, working ability, associated symptoms, and drugs used. Data were collected and statistically analyzed using SPSS version 22. **Results:** The present study showed statistically significant progress ($P < 0.05$) in reducing pain, rare physical and mental complaints, and improved working ability with no need for drugs in majority of patients. **Conclusion:** EMFT has better results than other methods in relieving pain and symptoms of dysmenorrhea with a settled lifestyle.

Keywords: Electromagnetic therapy, primary severe dysmenorrhea, women

Résumé

Introduction : La dysménorrhée primaire (MP) est une maladie publique touchant les jeunes femmes dans le monde entier, elle affecte leurs performances quotidiennes. Sévère récurrent les crampes utérines constituent la principale plainte chez 90 % des adolescentes et 50 % des femmes en âge de procréer. Cette étude visait à évaluer l'utilisation de la thérapie par champ magnétique dans le traitement de la dysménorrhée sévère de grade 3 et constitue un objectif encourageant pour poursuivre le travail quotidien sans douleur. **Méthodes:** Deux cent cinquante patientes ont été recrutées dans cette étude dans des cliniques gynécologiques de Bassorah, dans le sud de l'Irak. Tous souffraient de dysménorrhée sévère, les patientes ont été soumises à un questionnaire, à une échelle visuelle analogique et à un système de notation verbale multidimensionnelle. pour déterminer l'intensité de la douleur et le degré de dysménorrhée. Seules 38 jeunes femmes souffraient de dysménorrhée sévère de grade 3, avec des âges variés de 16 à 28 ans avec un âge moyen de 22,04 ± 1,43 ans et un indice de masse corporelle de 23,81 ± 1,94, patients soumis à un champ électromagnétique thérapie (EMFT), deux séances par semaine de 20 minutes chacune pendant 6 semaines. Trois catégories ont été évaluées, la capacité de travail, les symptômes associés et les drogues consommées. Les données ont été collectées et analysées statistiquement à l'aide de SPSS version 22. **Résultats:** La présente étude a montré des résultats statistiquement significatifs. progrès ($P < 0,05$) dans la réduction de la douleur, des plaintes physiques et mentales rares et amélioration de la capacité de travail sans recours à des médicaments dans la majorité des cas de malades. **Conclusion:** L'EMFT donne de meilleurs résultats que les autres méthodes pour soulager la douleur et les symptômes de la dysménorrhée avec un mode de vie sédentaire.

Mots-clés: Thérapie électromagnétique, dysménorrhée primaire sévère, femmes

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Access this article online

Quick Response Code:

Website: www.annalsafrmed.org

DOI: 10.4103/aam.aam_46_23

How to cite this article: Al Hassan RM, Abdullah NM, Al Tawry AM. Evaluation of electromagnetic therapy in the treatment of severe dysmenorrhea in young women of Basrah. Ann Afr Med 2024;23:189-93.

Submitted: 30-Mar-2023 **Revised:** 01-Aug-2023
Accepted: 17-Aug-2023 **Published:** 01-May-2024

Introduction

Primary dysmenorrhea (PD) is a painful recurrent spasmodic uterine cramps started shortly before or at the onset of the cycle with normal anatomy of pelvic region and no gynecological diseases.[1-3] It is usually started few months after menarche and probably continues to menopause.[4] PD is not only a common gynecological complaint but also a public health problem among young and adult females, the prevalence is variable in different countries, nearly 90% of young girls and more than 50% of menstruating women are suffering from PD.[5,6] It interferes with the physical, psychological, and social functions resulting in a significant burden on the quality of adolescents' and young females' lives.[7]

Women with PD have varying complaints ranging from mild to severe episodes of frequent cramps in lower abdomen, pain radiates to the back or thigh, Fatigue, constipation or diarrhea, frequent urination, sweating, abdominal distension, nausea, vomiting, headache, tiredness dizziness, emotional and sleep disturbance, anxiety, and depression.[8,9]

A combination of several factors involved in the pathogenesis of dysmenorrhea including overproduction or imbalance secretion of prostaglandin F2a, which originates in the secretory endometrium, the release of prostaglandin caused by high levels of oxytocin and vasopressin which is ultimately lead to uterine ischemia and activation of type C pain fibers, uterine contractions and threshold of pain are related to high levels of Prostaglandin F2α and Prostaglandin E2.[10,11]

The diagnosis of PD initially depends on history and physical examination to eliminate any pelvic diseases. Nonsteroidal anti-inflammatory drugs (NSAIDs) are mandatory in the management of dysmenorrhea by preventing cyclooxygenase enzymes from manufacturing prostaglandins (PGF). Contraceptive pills are also used for the treatment of dysmenorrhea in indicated females.[12] However, none of these can reduce the intensity of pain in majority of cases.

Nonpharmacological mediations are frequently adopted by dysmenorrheaic females such as heat application, pelvic floor aerobic exercises, warm beverages, sleep, massage, acupuncture, and dietary modifications, these interventions were assumed to prevent or minimize menstrual pain by increasing pelvic circulation, decreasing uterine contractions, and activating release of endorphins and serotonin.[13] All have limited effective results.

The new treatment noticed to prevent or reduce remarkably menstrual cramps is magnetic therapy which has been in progress for the last few years. It is safe, noninvasive with no drugs being used.[14] Previous studies deal with pulsated electromagnets of different designs resulting in meaningful pain-related outcomes which have been reported for different pain modalities including chronic pelvic pain in women.[15]

The pulsed electromagnetic fields (PEMF) have been recently considered as one of the most active physical techniques in the treatment of various pathological disorders. Selective neuronal depolarization of resting potential modification of cell membrane enhances blood flow, accelerates tissue repair and eliminates harmful mediators by changing the iron binding mechanism. This, in turn, modifies the release of cytokines and inflammatory mediators.[16]

To the best of our knowledge, studies were nil to investigate the perceived efficiency of different treatments in relieving severe dysmenorrhea pain in young women of Basrah city, therefore this study aimed to evaluate the potential effectiveness of electromagnetic field therapy (EMFT) in the treatment of severe dysmenorrhea grade 3, the outcomes would clarify the strategy of proceeding interferences aiming to educate dysmenorrheaic female on the proper use of electromagnetic therapy with positive impact on their lifestyle later on.

Methods

The present study was conducted on a total 250 female participants attending gynecological clinics in Basrah City southern Iraq from June 1, 2022 to December 1, 2022. A verbal consent was obtained from each woman before participating in the study and all females were given a full explanation about the procedure and aim of the study. They were asked to complete the questionnaire form related to demographic features, pain intensity, accompanying symptoms, and drugs used. The screening process started by subjecting all females to Visual Analog Scale Which is a graphic rating scale having numerical values placed along the line [Figure 1] and verbal multidimensional scoring system to assess the intensity of pain and the grade of dysmenorrhea Figure 2. Forty-three females were diagnosed to have severe dysmenorrhea (Grade 3) and they were within the inclusion criteria of this study, 5 females did not complete the study and were excluded. Only 38 females with ages ranging from 16 to 28 years old, and body mass index (BMI) 23.81 ± 1.94 kg/m^2, were included in the study. BMI is measured by the following equation:[17]

BMI = Weight (kg)/Height (m)^2

Therapy by NOVAMAG NT-60 must not be applied on women who have implantable devices and/or instruments

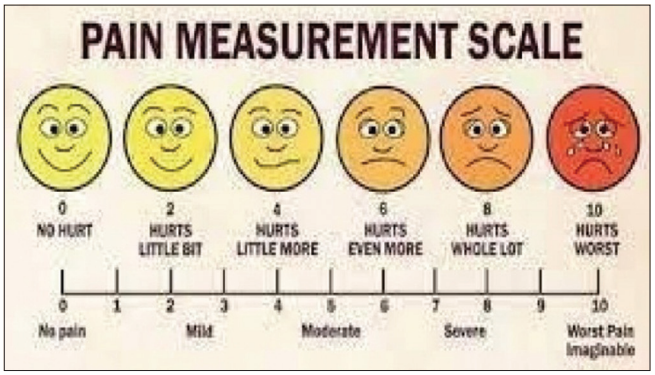

Figure 1: Assessment scales: Visual Analogue Scale, numerical rating scale. VAS = Visual Analogue Scale

Severity grading	Working ability	Systemic symptoms	Analgesics
Grade 0: Menstruation is not painful and daily activity is unaffected.	Unaffected	None	None required
Mild (Grade 1): Menstruation is painful but seldom inhibits normal activity; analgesics are seldom required; mild pain.	Rarely affected	None	Rarely required
Moderate (Grade 2): Daily activity is affected; analgesics required and give sufficient relief so that absence from school is unusual; moderate pain.	Moderately affected	Few	Required
Severe (Grade 3): Activity clearly inhibited; poor effect of analgesics; vegetative symptoms (headache, fatigue, vomiting, and diarrhoea); severe pain.	Clearly inhibited	Apparent	Poor effect

Figure 2: Verbal multidimensional scoring system (VMSS) for assessment of dysmenorrhoea severity

within their body, such as metallic implants, or who had pelvic surgery, menstruation, pregnant or feeling pregnancy, cardiac arrhythmia, pacemaker, chronic infections, perineum operation or malignancy, all should be excluded.

The electromagnetic stimulation occurs in the sitting position, patient is fully clothed after the evacuation of the bladder. It works on the pelvic floor by stimulating pudendal nerve and muscles to contract and relax. The recommended treatment by NOVOMAG NT 60 is 12–15 sessions, each session lasts for 20 min, 2 sessions per week and can be applied for 6 weeks [Figure 3]. Data collected were analyzed using IBM SPSS statistics Ver 22, mean and percentage were determined using descriptive statistics.

Results

Thirty-eight females with severe PD grade 3 enrolled with a mean age 22.04 ± 1.43 years and BMI 23.81 ± 1.94 as shown in Table 1.

Working ability

Thirty-eight female exhibited work-related limitations before treatment. However,after six weeks, the majority of these females (70%) showed a significant improvement ($P < 0.0001$),with a shift from grade 3 to grade 0 or 1 ,indicating a better outcome. In contrast, a minority of female (28%) still experienced work-related disability as indicated in Table 2.

Systemic symptoms

Regarding systemic symptoms associated with PD, 80% of patients improve with no or rarely have associated symptoms with *P* value of high significance (<0.00001). Only 20% of females resist treatment as demonstrated in Table 3.

Need to analgesia

More than 60% of females improve after treatment with no need for drugs with highly significant *P* value, only 15% continue with analgesia and about 20% have no shift of grade and poor effect of treatment as shown in Table 4.

Discussion

PD has different unfavorable effects on women and community. Gynecological problems related to menstruation in the Middle East have acknowledged little attention and PD is frequently ignored. Women facing severe dysmenorrhea with work disability need intervention and management.[18] Many explanations for this disorder are addressed by overproduction of uterine PGF particularly PGF2α5 with low level of progesterone during the luteal phase, high levels reached in first 2 days facilitating contractions, ischemia, and dysrhythmia, all lead to uterine hyper-contractility, reduced uterine blood flow and increased peripheral nerve sensitivity which ultimately activates pain.[19]

Figure 3: NOVAMAG NT-60 chair

Table 1: Demographic characteristics of the participants

Data	Mean±SD
Age (years)	22.04±1.43
Height (cm)	161.08±3.54
Body mass (kg)	66.34±5.43
Body mass index (kg/m^2)	23.81±1.94

SD=Standard deviation

The extent of PGs released after the sloughing process is proportionate to the intensity of the uterine contractions, although analgesics, oral contraceptive pills, and NSAIDs are common treatments for PD but about 20%–25% of cases are not improved and need new strategies such as magnetic therapy to compensate for work disability, this new intervention based on a simple evidence, individuals feel pain when pain impulses in nerves conveyed to the brain by travelling through the body, the magnetic treatments are designed to stop pain impulses from reaching the brain (stop the pain at the source), it is considered the proper choice when electromagnets are placed in the suitable site, the mechanism of action explained as EMFT stimulates the expression of cytokines which is involved in activation of endogenously expressed opioid precursors result in decreasing pain and inflammatory responses.[20]

From the current study, we noticed that using NOVAMAG NT-60 therapy trial is encouraging because of a large number of female who had benefits to continue work, rare symptoms, and minimum drug use as shown in Tables 2-4, working on muscle strengthening increase cortical consciousness, adrenergic activities and decrease cholinergic.[21] There is a significant decrease in pain intensity in grade 3 PD for women treated by electromagnetic field, results come in agreement

Table 2: Working ability before and after treatment

Pretreatment			Posttreatment			*P*
Grade	***n***	**Working ability**	**Grade**	***n* (%)**	**Working ability**	
Grade 3	38	Clearly inhibited	Grade 0	6 (15.78)	Unaffected	<0.00001
			Grade 1	19 (50)	Rarely affected	
			Grade 2	2 (5.26)	Moderately affected	
			Grade 3	11 (28.94)	Clearly inhibited	

Table 3: Systemic symptoms before and after treatment

Pretreatment			Posttreatment			*P*
Grade	***n***	**Systemic symptoms**	**Grade**	***n* (%)**	**Symptoms**	
Grade 3	38	Apparent	Grade 0	9 (23.68)	None	<0.00001
			Grade 1		None	
			Grade 2	21 (55.26)	Few	
			Grade 3	8 (21.05)	Apparent	

Table 4: Need to analgesia before and after treatment

Pretreatment			Posttreatment			*P*
Grade	***n***	**Needanalgesia**	**Grade**	***n* (%)**	**Need analgesia**	
Grade 3	38	Poor effect	Grade 0	4 (10.52)	None required	<0.00001
			Grade 1	20 (52.63)	Rarely required	
			Grade 2	6 (15.78)	Required	
			Grade 3	8 (21.05)	Poor effect	

with many articles dealing with pain control by noninvasive modality such as Maestú *et al*. who carried a study on females with fibromyalgia.[22] Hedén and Pilla who studied the effect of PEMF on postoperative pain in females breast augmentation.[23] Mohammad *et al*. found that EMFT is more effective than aerobic exercise in treating PD.[14] Magnetic stimulation provides a new treatment technique for chronic pelvic pain in patients who do not respond to pharmacotherapy. Furthermore, the results are in line with those of Kim *et al*. who studied the impact of using repetitive magnetic stimulation for both pelvic floor dysfunction and chronic pelvic pain syndrome.[24] Study outcomes would advise the strategy of upcoming interventions aiming to educate females with dysmenorrhea for suitable management protocols.

Conclusion

There is sufficient evidence to make magnetic field therapy an advisable treatment of choice for many sufferers of menstrual pain. If it does not work, nothing happens as it is a harmless, noninvasive, and no drug-used therapy. We have seen almost all our participants declare almost immediate pain relief.

Acknowledgments

The authors appreciate and thank all female patients who collaborate in this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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