

## EFFECT OF MICROWAVE DIATHERMY ON PRIMARY DYSMENORRHEA: AN EXPERIMENTAL STUDY

Anand Heggannavar <sup>\*1</sup>, Rohan S. Kalekar <sup>2</sup>, Ronita Ajgaonkar <sup>3</sup>.

<sup>\*1</sup> Associate Professor, KLE University, Institute of Physiotherapy, Belagavi, Karnataka India.

<sup>2,3</sup> BPT, KLE University, Institute of Physiotherapy, Belagavi, Karnataka, India.

### ABSTRACT

**Introduction:** Primary dysmenorrhea is one of the leading causes of school and work absenteeism and reduced quality of life in women. Primary dysmenorrhea is characterized as cramp like pain in the lower abdomen or low back during the menstrual period in the absence of disease such as endometrioses. Primary dysmenorrhea occurs due to increased myometrial contractility and uterine ischemia. Females of reproductive age group 18-45 years are commonly affected. Microwave diathermy is a deep heating modality. Microwave radio frequency radiations are usually used clinically to heat deeply situated tissues in the body and coincidentally minimize the rise in the skin temperature seen in other forms of therapeutic heating. There are various studies suggesting the effect on microwave diathermy on numerous musculoskeletal conditions. As there is paucity of literature available on the use of microwave diathermy on primary dysmenorrhea, hence the present study is intended to evaluate the effect of microwave diathermy on primary dysmenorrhea.

**Materials and Methods:** 30 subjects between the age group 18-30 (21.50±1.04) years of age with primary dysmenorrhea were recruited from constituent units of KLE University Belagavi. Participants were randomly assigned to one group i.e. Group A (n=30) and were treated with microwave diathermy for 20 minutes. Outcome was measured in terms of pain using NRS (numeric rating scale) and quality of life was assessed using Moos menstrual distress questionnaire pre-treatment and post treatment session on the 1st or the 2nd day of their perimenstrual symptoms. To assess changes within the group before and after intervention period, the data was analyzed with the paired 't' test.

**Results:** NRS scores pre-treatment and post-treatment was 7.07±0.98 and 1.53±1.01 respectively, Moos menstrual distress questionnaire score reduced from 90.03±21.15 to 48.20±10.66 after treatment. Statistical analysis showed significant difference with p value = 0.0001.

**Conclusion:** Microwave diathermy is effective in relieving pain and perimenstrual symptoms in primary dysmenorrhea thereby improving the quality of life in females.

**KEY WORDS:** Primary dysmenorrhea, microwave diathermy, Numeric rating scale (NRS), Moos menstrual distress questionnaire (MMDQ).

**Address for correspondence:** Dr. Anand Heggannavar, Associate Professor, KLES University, Institute Of Physiotherapy, JNMC campus, Nehru nagar, Belgaum 590010, Karnataka, India. Phone no.: +919945282896 **E-Mail:** [anandhegs@yahoo.co.in](mailto:anandhegs@yahoo.co.in)

### Access this Article online

#### Quick Response code



DOI: 10.16965/ijpr.2016.186

#### International Journal of Physiotherapy and Research

ISSN 2321- 1822

[www.ijmhr.org/ijpr.html](http://www.ijmhr.org/ijpr.html)

Received: 05-10-2016

Accepted: 08-11-2016

Peer Review: 06-10-2016

Published (O): 11-02-2017

Revised: None

Published (P): 11-02-2017

### INTRODUCTION

Dysmenorrhea is one of the leading causes in gynecological problem for which the young women visit the clinical physicians. It is defined

as a condition in which there is pain during menstruation or difficult blood flow during menstruation [1]. etiologically, dysmenorrhea is classified into primary.

Dysmenorrhea and secondary dysmenorrhea [2]. Menstrual pain that is not associated with any anatomical pelvic pathology is defined as primary dysmenorrhea. Secondary dysmenorrhea is a condition in which there is associated anatomical pathology [3]. It is commonly seen in women with chronic pelvic inflammatory disease [4].

About 50% of post-pubertal women are affected by primary dysmenorrhea [5]. Age is one of the determinants of menstrual pain [6]. Symptoms are more commonly seen in young females as compared to older females [6-8]. Some of the other factors associated for severe dysmenorrhea consists of heavy and increased menstrual flow [9-11]. Recent study has suggested that increased exposure to environmental tobacco smoking is associated with primary dysmenorrhea [12].

Females usually complain of aching pain or cramp like pain in the abdomen or lower back before or during the menstrual period. It reaches its peak after 24 hours and the symptoms usually comes down after 2-3 days [13].

There are different measures to treat primary dysmenorrhea conservatively and therapeutically. Physiotherapy treatment involves reduction of pain and perimenstrual symptoms to improve the quality of life. Various therapeutic modalities such as transcutaneous electrical nerve stimulation, interferential current, thermotherapy and cryotherapy are been used for primary dysmenorrhea [14].

Microwave diathermy is a deep heating modality clinically used to heat deeply situated tissues in the body and coincidentally minimize the rise in the skin temperature seen in the other form of therapeutic heating [14]. Microwave diathermy is used in conditions such as localized infections, inflammations, degenerative conditions and musculoskeletal pain relief [15].

A case study was conducted by April R Vance et al on female suffering with primary dysmenorrhea since 18 years. Microwave diathermy was administered for 20 minutes on the symptoms were felt every month. Over a period on 7 months the subject found relief in the intensity of pain. The research therefore concluded postulating that microwave diathermy can be used

in primary dysmenorrhea [16]. A study was conducted by Giombini et al to evaluate the effect of hyperthermia induced by microwave diathermy in the management of muscle and tendon injuries. On the basis of the research, they concluded that microwave diathermy can be effective in the short term management of musculoskeletal injury with the wavelength of 434 and 915 MHz [17]. There are various studies suggesting the effect of microwave diathermy on numerous musculoskeletal conditions. As there is paucity of literature available on the use of microwave diathermy on primary dysmenorrhea, hence the present study is intended for the same.

## MATERIALS AND METHODS

**Participants-** 30 subjects suffering with primary dysmenorrhea were recruited in the study. The inclusion criteria for the above subjects were a) individual between 18-30 years of age, b) onset of pain within 6-12 hours after the onset of menses, c) lower abdominal or pelvic pain associated with onset of menses lasting for 8-72 hours, d) low back pain during menses, e) intensity of pain rating on 0-10 NRS is at least 3. The exclusion criteria were a) secondary dysmenorrhea, b) visual or auditory handicaps, c) parity, d) loss of sensations, e) metal implants.

The study was carried out in KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi. The study was approved by Institutional Ethical Committee of KLES Institute of Physiotherapy, Belagavi.

**Outcome measures:** The outcome measures used were Numeric Rating Scale (NRS) for intensity of pain and Moos Menstrual Distress Questionnaire (MMDQ) was used to assess the quality of life. Pain was measured using NRS by asking the patient to mark a point as per the severity of her pain on a 0-10 cm scale, where 0 symbolized no pain, 5 symbolized moderate pain and 10 symbolized worst pain. Perimenstrual symptoms and quality of life was assessed using Moos questionnaire. The questionnaire consists of 47 items, each describing a 'symptom that women experience'; the subjects were asked to rate their experience of symptom on a 6- point scale, ranging from "no experience of symptom" to "acute or partially disabling."

**Intervention:** The subjects were randomly allocated to one group i.e Group A (n=30). The subjects were positioned either in supine lying (fig.1) or prone lying (fig.2) depending upon the site of pain, the participants received microwave diathermy for 20 minutes on the 1<sup>st</sup> or the 2<sup>nd</sup> day depending on the pain and perimenstrual symptoms.

**Fig. 1:** MWD for lower abdominal pain.



**Fig 2:** MWD for lower back pain.



participants included in the study were 20.00 and 24.00 years respectively. Mean age of the females was 21.50±1.04 years.

**Weight, Height and BMI:** Table no.1 explains about the mean weight, height and BMI of the individuals participated in the study. The mean weight and height of the females recruited in the study was 55.90±7.42kgs and 158.13±6.51cms respectively. In this study the mean BMI was found to be 22.32±2.45 kg/m<sup>2</sup>.

**Numeric Rating Scale:** NRS was used to assess the severity of pain. There was reduction in pain observed in the participants after undergoing a session with microwave diathermy. The NRS scores reduced from 7.07±0.98 (baseline) to 1.53±1.01 (post intervention). The p value by paired "t" test was found to be 0.0001 which is highly significant.

**Moos Menstrual Distress Questionnaire:** Moos menstrual distress questionnaire was used to evaluate the perimenstrual symptom. MMDQ scored were reduced from 90.03±21.15 (baseline) to 48.20±10.66 (post treatment). A mean difference of 41.83±17.42 was observed between the pre-treatment and post-treatment. The p value by paired t test was found to be 0.0001 which is highly significant.

**Table 1:** Demographic Data.

	Age (yrs)	Weight (kgs)	Height (cms)	BMI (kg\m <sup>2</sup> )
Mean	21.5	55.9	158.13	22.32
SD	1.04	7.42	6.51	2.45

**Table. 2:** NRS SCORE.

Time	Mean & SD	Mean Diff. & SD	T	P
Pretest	7.07±0.98	5.53±1.25	24.2047	0.0001*
Posttest	1.53±1.01			

\* highly significant

**Table 3:** MOOS score.

Time	Mean & SD	Mean Diff. & SD	T	P
Pretest	90.3±21.15	41.83±17.42	13.1519	0.0001*
Posttest	48.2±10.66			

\* highly significant

## RESULT

The results were analyzed in terms of pain relief as per NRS and improvement in quality of life by using MMDQ.

**Statistical analysis:** Statistical analysis of the present study was done by using SPSS version. Various statistical measures such as mean, standard deviation and test of significance such as paired "t" test were used to analyze the data. Probability values less than 0.05 were considered statistically significant and probability values less than 0.01 were considered highly significant.

**Age Distribution:** Participants included in the present study were 18-30 years of age group. The minimum and the maximum age of the

## DISCUSSION

The present study was conducted to determine the effect of microwave diathermy on primary

dysmenorrhea in terms of pain relief and improvement in quality of life.

Common treatment, microwave diathermy was administered to all the 30 subjects that were recruited in the subject for 20 minutes on the 1<sup>st</sup> or the 2<sup>nd</sup> day of their perimenstrual symptoms. The outcome measures used were NRS to assess the pain intensity and MMDQ to assess the quality of life.

The result from the statistical analysis of the present study suggests that microwave diathermy is effective in relieving the intensity of pain and perimenstrual symptoms thereby improving the quality of life. There was significant improvement seen in all the recruited subjects for their NRS and MMDQ scores.

The participants received microwave diathermy for 20 minutes. Microwave diathermy is a deep heating modality. Muscle spasm resulting from ischemia can be relieved<sup>18</sup> by the direct inhibitory effect of heat on those elements of muscle spindle active in maintaining spasm [19].

The present study is similar to a case study which was conducted by April R Vance et al in which Microwave diathermy for 20 minutes was applied as a treatment regimen for primary dysmenorrhea and found that microwave diathermy to be effective in reducing pain [16].

According to a study which was conducted in Dhaka Medical College by Shoma FK et al to evaluate the effectiveness of microwave diathermy in patients with chronic low back pain in 50 subjects, the study concluded that microwave diathermy can be an effective modality in the treatment of chronic low back pain [20].

Alessia Rabini et al conducted a study to evaluate the effect of microwave diathermy on shoulder pain and function in patients with rotator-cuff tendinopathy in comparison with sub acromial corticosteroid injection, it was a single blind randomized trail which recruited 92 patients. The patients were allocated randomly to either microwave diathermy or sub acromial corticosteroid injection. The study concluded that the effect of microwave diathermy was equivalent to the sub acromial corticosteroid injection [21].

These may be attributed to microwave diathermy that has effect on pain relieving due to [18]:

Vasodilatation and hyperemia due to release of histamine and bradykinin in tissues, the same can occur in deeper structures by reflex activity.

Hyperthermia stimulates repair process, increased drug activity and allow more efficient relief from pain and helps in removal of toxic wastes.

Hyperthermia induces hyperemia improves local drainage, increases metabolic rate.

Vasodilatation leads to increased rate of enzymatic biological reactions which in turn leads to increased rate of cellular biochemical reaction.

Increased nerve conduction velocity leads to reduced pain perception that occurs in response to increasing tissue temperature.

A comparative study was done by Cristina Larroy in Spain to assess the menstrual pain by using VAS and Numeric rating scale. The data was obtained from the two scales and it was said that numeric rating scale is easier and more convenient to use than VAS [22]. A study was developed by Moos Rudolf M. in the year 1968 on Menstrual Distress Questionnaire in which the symptoms related to menstruation was conducted [23].

In the present study "effect of microwave diathermy on primary dysmenorrhea" parameters used were the NRS (Numeric Rating Scale) and MMDQ (Moos Menstrual Distress Questionnaire), significant reduction in scores of above parameters were been observed which led to an improvement in the functional abilities of the person after the intervention.

Reduction in pain, cramps and associated symptoms will lead to an improvement in the functional abilities of the subjects, which was also seen in the present study. The present study results, does reflect that microwave diathermy does have effect on primary dysmenorrhea which was measured in terms of pain relief, improvement in functional abilities and quality of life.

## CONCLUSION

The results of the present study conclude that, microwave diathermy can be beneficial in the treatment of primary dysmenorrhea to relieve pain and improve the quality of life in terms of

Numeric Rating Scale and Moos Menstrual Distress Questionnaire respectively.

**Conflicts of interest: None**

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### How to cite this article:

Anand Heggannavar, Rohan S. Kalekar, Ronita Ajgaonkar. EFFECT OF MICROWAVE DIATHERMY ON PRIMARY DYSMENORRHEA: AN EXPERIMENTAL STUDY. *Int J Physiother Res* 2017;5(1):1802-1806. DOI: 10.16965/ijpr.2016.186