



EFFECT OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION VERSUS INTERFERENTIAL CURRENTS AND YOGIC POSTURES ON PAIN AND QUALITY OF LIFE IN SUBJECTS WITH PRIMARY DYSMENORRHEA

Physiotherapy

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KEYWORDS

INTRODUCTION

Primary dysmenorrhea (PD) is defined as menstrual pain associated with regular ovulatory cycles, with no pelvic pathology and a clear physiological cause. The peak is usually between 24 and 48 hours and the pain normally goes away after 2 or 3 days, as the blood volume drops. (5) Myometrial inflammation is the cause of spasmodic discomfort. Contractions brought on by a rise in PGF2a released under the impact of progesterone.(1)

Secondary dysmenorrhea (SD) is menstrual pain that is connected with an identified condition (endometriosis, fibroids, adenomyosis, pelvic adhesions, endometrial polyps, pelvic inflammatory disease) Secondary dysmenorrhea can cause pain before and after menstruation (8-72 hours).(5)

The exact cause of primary dysmenorrhea is unknown, however the majority of symptoms can be explained by uterine prostaglandins, particularly PGF2-alfa. Women with dysmenorrhea had elevated prostaglandin levels in their endometrial fluid. The increase in prostaglandins in the endometrium following the drop in progesterone in the late luteal phase causes increased myometrial tone and excessive uterine contraction.(2)

Premenstrual syndrome symptoms include irritability, anxiousness, depression, and abdominal distention. Pain normally appears within hours of the start of menstruation and peaks as the flow becomes greatest during the first day or two of the cycle.(3)

Vasopressin and leukotriene levels have also been found to be higher in women with acute menstrual pains than in women who have mild or no pain of menstrual. The posterior pituitary hormone vasopressin may be responsible for myometrial hyper sensitivity, decrease uterine blood flow, and pain in primary dysmenorrhea. Vasopressin role in the endometrium may be related to prostaglandin synthesis and release. Several years after menarche, transient disturbances of progesterone secretion in the luteal phase are commonly observed in adolescents(6) Breast discomfort, nausea, headaches, fatigue, diarrhea, and tenderness are among the physiological signs and symptoms that follow Primary dysmenorrhea (PD). Research indicates that doing asanas improves physical health by reducing sympathetic nervous system activity and the hypothalamo-pituitary-adrenal axis. Asanas provide physiological benefits for the immune system and particular neurotransmitter action.(10)

Relaxation, like exercise, can improve mental stability, lower blood pressure, reduce muscle tension, reduce anxiety and stress, and lessen fatigue. As a result, it aids in lowering the body's oxygen requirements. (4)

Long-term sports can reduce stress, reducing sympathetic nerve activity and reducing menstrual symptoms. Additionally, sports can increase Endorphin Beta levels, which can alleviate pain and reduce menstrual symptoms.(8)

Mind-body interventions (MBI) include practices like yoga, tai-chi, and meditation that promote both physical and mental well-being. MBI not only promotes physiological changes such as

parasympathetic activation, decreased cortisol secretion, reduced inflammation, and delayed aging, but it also induces psychological changes such as decreased anxiety and melancholy.(9)

Yoga is a practice that promotes mental and physical well-being, with roots in ancient Indian philosophy. Yoga has numerous advantages to the mind and body, with a focus on stress management, making one feel more tranquil and at ease. Yoga is a safe, cost-effective, and non-invasive approach for pain management. It includes breathing exercises, meditation, and physical activity to build muscle and relieve stress.(9)

The physiotherapeutic treatments, which are supported by clinical trial data, could be a very useful treatment alternative for women with Primary dysmenorrhea, especially those who are not eligible for pharmacological therapy, because physiotherapy has no side effects, according to the analyzed studies(6,7)

Studies have shown that TENS can effectively reduce the intensity and duration of menstrual pain, offering an alternative to pharmacological treatments like NSAIDs or oral contraceptives (Berman et al., 2017; Harel, 2012). It is generally safe, with minimal side effects, making it an attractive option for women seeking non-medication treatments. TENS is especially useful for those with mild to moderate pain, although its effectiveness can vary from person to person (Hernandez et al., 2017). It can be used conveniently at home, offering flexibility during menstruation. However, further research is needed to fully understand the mechanisms of TENS and its long-term benefits (Vanti et al., 2020). Overall, TENS serves as an effective adjunct or alternative treatment for managing primary dysmenorrhea for some individuals.(11,12,13,14)

AIMS AND OBJECTIVES

- Aim of the study is to find the effect of TENS versus IFT along with yogic postures on pain and quality of life in primary dysmenorrhea subjects.
- To compare the effect of TENS versus IFT and YOGIC POSTURES on pain and quality of life using visual analog scale and menstrual distress questionnaire in primary dysmenorrhea individuals.

METHODOLOGY

Study Design: Experimental study design

Study Population :

Subjects with primary dysmenorrhea with age group of 18-25 years were recruited in this study.

Study Setting: College of physiotherapy, SVIMS.

Treatment Duration: 30 minutes for 3 times in a week.

Study Duration: 3 months

Sampling Design: Randomised control trail.

Inclusion Criteria:

- Age group 18-25 years
- Normal BMI
- Individuals with regular menstrual cycles

Exclusion Criteria:

- Irregular or infrequent menstrual cycle
- PCOD
- Intra uterine contraceptive devices
- Structural Abnormalities
- Any pelvic dysfunctions and Pathologies like endometriosis

Outcome Measures:

1. Visual Analogous Scale
2. Menstrual Distress Questionnaire

Ethical Consideration:

Ethical approval was obtained from the Institutional Ethical Committee (IEC No: 1704), and informed consent was taken from all eligible participants.

Study Sample :

A sample of 30 primary dysmenorrhea individuals , who met inclusion criteria, recruited for the study.

Study Procedure :

All subjects who fulfilled screening were eligible and informed about the study and written informed consent had taken before the starting of the treatment. A sample of 30 individuals were screened. Participants were randomly assigned into two groups GROUP-A and GROUP-B by lottery method.

GROUP-A (15 subjects)- Interferential therapy along with yogic postures are given.

GROUP-B (15 subjects) – Transcutaneous electrical nerve stimulation along with yogic postures are given.

Base line evaluation of pain/quality of life were taken from all subjects by using Visual analogous scale & Menstrual distress questionnaire and recorded as pre-test data. Then after the treatment protocol the evaluation of visual analogous scale and menstrual distress questionnaire were recorded as post test data.

Treatment Protocol:

Protocol given for 12 Weeks

GROUP-A (15 subjects)- Interferential therapy along with yogic postures were given.

Initial 24-72hrs(1-3days) IFT given to subjects, followed by (after 5 days) yogic postures done by the subject Patients were positioned prone, with a thin pillow placed under their abdomen, for the application. IFC with frequencies of 0–100 and 90–100 pulse/seconds was used (10 minutes each), respectively, to increase circulation (0–100 pulse/seconds) and to have a sedative effect. Polar stimulation with four vacuum electrodes was performed by Electronica Pagani ET20 I Rolandserie (Paderno Dugnano, Italy). Two vacuum electrodes (A1, B1) were placed to the proximal margin of low back area, and the others (A2, B2) to the proximal of gluteal region laterally. The intensity of current was increased up to the tolerated level.

Group-b (15 subjects) – Transcutaneous electrical nerve stimulation along with yogic postures were given.

Initial 24-72hrs, TENS given to subjects, followed by (after 5days) yogic postures done by the subjects.

Conventional TENS with a frequency of 120 Hz and pulse duration of 100 µsecond was applied for a total of 20 minutes in the same position to the same regions. The intensity of current was increased up to the tolerated level without leading any contraction.

Yogic postures - 3sessions/week, each session done for 30mins

Yogic postures include-

1. Supta swastikasana
2. Supta Baddhakonasana
3. Adhomukha virasana

4. Adhomukha Swastikasana

5. Paschimottanasana

Each pose should be held for 5 min followed by 3min of shavasana.

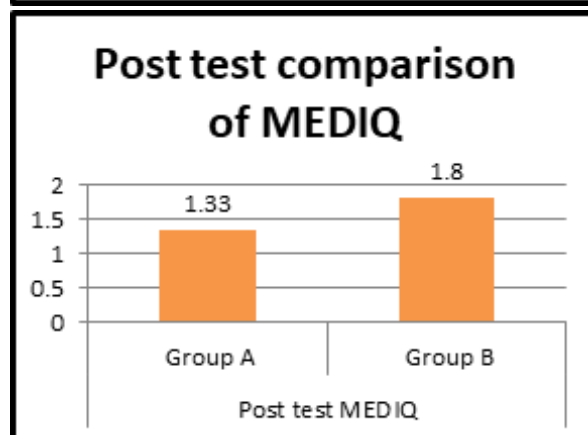
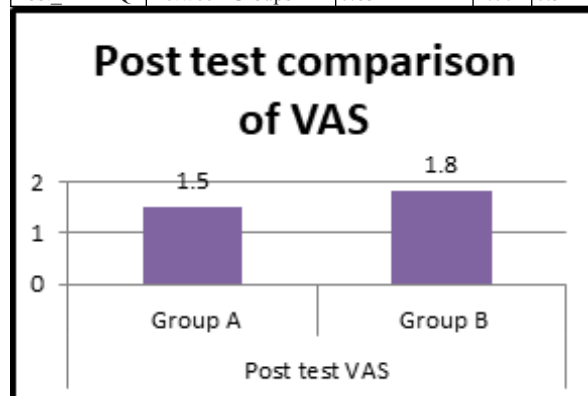
Statistical Analysis:

The results were analyzed using SPSS Software version 23. Individual data was analysed by intension to treat. All continuous data was assessed for normality. Continuous data was described using mean and standard deviation. Dichotomous outcomes were presented as risk ratios with 95% confidence intervals using ANOVA test. Difference in the outcome was compared between the 2 groups. A “p” value 0.05 was considered statistically significant.

RESULTS :

The results indicate that there was no significant difference in the pain Level between group-A which received IFT & yogic posture & Group-B which received TENS & yogic postures.

		Mean Square	F	Sig.
Pre VAS	Between Groups	0.13	0.02	0.86
Post VAS	Between Groups	0.53	0.29	0.59
Pre MEDIQ	Between Groups	0.30	0.52	0.47
Post MEDIQ	Between Groups	0.83	1.00	0.32



Similarly the menstrual distress Score between group-A & group - B did not show any statistical significance and indicating that both intervention were equally effective in relieving the menstrual distress.

DISCUSSION:

The present study was conducted to see the effects of TENS versus IFT along with yogic postures on relieving the pain & improving the quality of life.

The study was conducted with 30 subjects. Subjects were divided into two groups. Group-A (IFT with yogic postures) & Group-B (TENS with yogic postures). Prior consent was taken. The treatment protocol was carried out for 3 days per week for 12 weeks. The outcome measures for this study were visual Analogous scale for evaluating pain and Menstrual distress questionnaire for assessing quality of pain. The results of this study showed that there was significant difference in reducing the intensity of pain and improving quality of life after 12 weeks of intervention in both groups.

Busra Yilmaz MSc et al. taken 80 female nursing students given a 6-

session cognitive-behavioral approach. They concluded that it is cost-effective, reliable, cognitive-behavioral approach based dysmenorrhea support program can be used to relieve symptoms, decrease the use of analgesics, and increase knowledge about primary dysmenorrhea.

Shreeya Dilip Berde et al. studied 50 subjects were divided into 2 groups i.e. Group A subjects were given core strengthening exercises and Group B subjects were given chair aerobic exercises. The interpretation of the study was done on the basis of comparing pre-test and post-test assessment of VAS and VMSS. They concluded that the core strengthening exercises were significantly effective than chair aerobics in reducing the quality of pain and improving the quality of life in females suffering from primary dysmenorrhoea.

Hend S Saleh et al. The randomized controlled study conducted on 150 females and they were randomly assigned to two exercises and one control groups using a computer-generated randomization list. The interference groups were asked to comprehensive either active stretching or core strengthening practice for 8 weeks (4 days per week, 2 times a day, 10 min) at home. Pre-test and two post tests for all the groups were examined for pain intensity using Visual Analog Scale (VAS). They concluded that active stretching or core strengthening exercises seem to be an easy, non-pharmacological method for managing primary dysmenorrhea.

Sara Azima MSc et al. conducted a randomized controlled trial among 102 students with primary dysmenorrheal. The student groups were randomly divided into massage, isometric exercises, and control groups. The first group received 2 consecutive cycles of effleurage massage with lavender oil. The second group had 8 weeks of isometric exercises. No intervention was performed for the control group. Pain intensity was measured and recorded by using a visual analog scale. They concluded that massage therapy and isometric exercises were effective in reducing some symptoms of dysmenorrhea.

Nazan Tugay et al. 34 subjects with primary dysmenorrhea (mean age: 21.35 ± 1.70 years) were included. Statistical analyses were performed in 32 subjects who completed all measures. Interventions. 15 subjects received interferential current application for 20 minutes and 17 subjects received transcutaneous electrical nerve stimulation for 20 minutes. Visual analog scale (VAS) intensities of menstrual pain, referred lower limb pain, and low back pain were recorded before treatment, and immediately, 8 hours, and 24 hours after treatment. They concluded that both transcutaneous electrical nerve stimulation and interferential current appear to be effective in primary dysmenorrhea.

Mike Armour et al. included a total of 12 trials with 854 women in the review, with 10 trials and 754 women in the meta-analysis. Nine of the 10 studies compared exercise with no treatment, and one study compared exercise with NSAIDs. They taken Moos Menstrual Distress Questionnaire to measure the menstrual symptoms. They concluded that the overall health benefits of exercise, and the relatively low risk of side effects reported in the general population, women may consider using exercise, either alone or in conjunction with other modalities, such as NSAIDs, to manage menstrual pain.

Keiko Fukushima et al. checked dysmenorrhea levels and assessed menstrual symptoms according to the presence of premenstrual syndrome (PMS). Dysmenorrhea was evaluated according to quartiles of the sum of the Menstrual Distress Questionnaire (MDQ). PMS was assessed using the Premenstrual Symptoms Questionnaire (PSQ).

Study Limitations

- Sample size is small
- The women in the age group of 17-25 years were chosen; hence, this study may not stand true for women in other age groups.
- Ultrasonography was not performed to rule out other gynecological conditions
- Control group was not formulated to rule out the placebo effect.

Future Recommendations:

- The future study is recommended with large sample size.
- Future studies could look at comparing different programs in these modalities and also in other age groups to better analyze the effectiveness.

The future study is recommended for follow up after the 6 months of study.

CONCLUSION:

The present study concludes that both IFT and TENS along with yogic postures are effective in treating pain from primary dysmenorrhea. Young women tend to tolerate IFT currents better, likely due to their medium frequency. By supporting both the body and mind, yoga provides a holistic approach to managing primary dysmenorrhea. Yoga poses target the pelvic floor and abdominal muscles, releasing accumulated tension in the lower back and pelvic region. As the muscles relax, the intensity of the cramps decreases. Both methods work well for pain relief, with no significant difference in effectiveness. The medium-frequency currents in IFT are particularly well-tolerated by younger women. Overall, both treatments offer equal pain management benefits for primary dysmenorrhea.

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Consent For Publication - Written consent was obtained from all the participants.

REFERENCES:

1. Guruprasad P, Sharma U, Palekar T, Pimpri P. Immediate Effect of Yoga Postures v/s Physiotherapy Exercises Along With K-Taping on Pain in Dysmenorrhea. *International Journal of Scientific Research in Science and Technology*. 2019;6(2):487-94.
2. SANDHIYA DM, KUMARI DP, Arulya A, SELVAM DP, ABRAHAM DM, PALEKAR DT. The effect of pelvic floor muscles exercise on quality of life in females with primary dysmenorrhea. *Annals of the Romanian Society for Cell Biology*. 2021 May 22;25(6):3111-7.
3. Tugay N, Akbayrak T, Demirtürk F, Karakaya İ, Kocaacar Ö, Tugay U, Karakaya MG, Demirtürk F. Effectiveness of transcutaneous electrical nerve stimulation and interferential current in primary dysmenorrhea. *Pain Medicine*. 2007 May 1;8(4):295-300.
4. Sakpal S, Patil C. Efficacy of Chair Aerobics and Progressive Muscle Relaxation in Primary Dysmenorrhea. *Journal of Coastal Life Medicine*. 2023 Jul 14;11:1511-6.
5. Valentine JC, Pigott TD, Rothstein HR. How many studies do you need? A primer on statistical power for meta-analysis. *Journal of Educational and Behavioral Statistics*. 2010 Apr;35(2):215-47.
6. Kannan, P.; Claydon, L.S. Some physiotherapy treatments may relieve menstrual pain in women with primary dysmenorrhea: A systematic review. *J. Physiother*. 2014, 60, 13–21. [CrossRef] [PubMed]
7. Fernández-Martínez, E.; Onieva-Zafra, M.D.; Parra-Fernández, M.L. The impact of dysmenorrhea on quality of life among spanish female university students. *Int. J. Environ. Res. Public Health* 2019, 16, 713. [CrossRef] [PubMed]
8. Parveen N, Alshammari R, Alshammari H, Alshammari T, Alsamaan S, Ali N. Aerobic exercises and its effects on primary dysmenorrhea among women at Hail city, Saudi Arabia. *International Journal of Medicine in Developing Countries*. 2020 May 16;4(5):869-.
9. Chhikara A, Jain M, Vats S, Kashoo FZ, Chahal A, Guliy S, Vajrara KR, Sidiq M, Rai RH. Role of Yoga in Minimizing Stress and Anxiety in Women Experiencing Dysmenorrhea. *Journal of Lifestyle Medicine*. 2023 Aug 8;13(2):90.
10. Franklin RA, Butler MP, Bentley JA. The physical postures of yoga practices may protect against depressive symptoms, even as life stressors increase: A moderation analysis. *Psychol Health Med* 2018;23(7):870-9.
11. Berman, M., et al. (2017). *Effectiveness of transcutaneous electrical nerve stimulation in treating primary dysmenorrhea: A systematic review*. *Journal of Obstetrics and Gynaecology Research*.
12. Harel, Z. (2012). *Dysmenorrhea in adolescents and adults: Pathophysiology, diagnosis, and treatment*. *Journal of Pediatric and Adolescent Gynecology*.
13. Hernandez, A., et al. (2017). *Transcutaneous electrical nerve stimulation (TENS) for pain relief during menstruation: A randomized controlled trial*. *Pain Management Nursing*.
14. Vanti, C., et al. (2020). *Transcutaneous electrical nerve stimulation (TENS) for dysmenorrhea: A comprehensive review*. *European Journal of Pain*.