Effect of dry needling in myofascial trigger points of abdominal muscles in primary dysmenorrhea

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ABSTRACT

Introduction and Aim: Primary dysmenorrhea is the most common gynecological problem among adolescent females, and it is the most common reason of sickness absenteeism from school and work. Emotional and behavioral problems may exacerbate menstrual cycle problems and dysmenorrheal (9). Due to the negative effects of dysmenorrhea on an individual's physiological status, health related quality of life may be disrupted among adolescent females. Managing dysmenorrhea with non-steroidal anti-inflammatory drugs (NSAIDS) and oral contraceptives is reported to be associated with side effects such as nausea, breast tenderness. Dry needling involves disruption of myofascial trigger points (MTrPs) which is the probable cause of primary dysmenorrhea, which decreases the pain and improves quality of life. The pain relief could be instantaneous, and the effects could long last. The objective of the study was to find the effectiveness of dry needling for abdominal muscles in decreasing menstrual cramps.

Methodology: 40 subjects were recruited according to inclusion and exclusion criteria. Group A, 20 subjects were received dry needling for trigger points in rectus abdominal and external oblique along with self-abdominal stretching. The total number of sessions is 2 days per week for 2 weeks and during each session dry needling has to be given for 2 to 3 trigger points. Group B, 20 subjects were advised for conservative method using hot pack and self-stretching exercises were prescribed. The outcome measures used were numerical pain rating scale and Moos menstrual distress questionnaire.

Results: The results of this study were statistically significant in numerical pain rating scale, pretest and posttest with the p values ($p<0.0001$). In Moos menstrual distress questionnaire (MMDQ), also had significant difference among the values of ($p<0.0001$). Between the posttest mean and standard deviation of MMDQ of both group A and group B are 39.5(9.39) and 49.5(12.6) respectively and there was a significant difference among the values ($p<0.0071$).

Conclusion: This study shows the significant improvement by giving dry needling along self-stretching exercise comparing to conservative management like heat application and self-stretching exercises in primary dysmenorrheal subjects.

Keywords: Dysmenorrhea; dry needling; abdominal pain; trigger points

INTRODUCTION

Dysmenorrhea is the most common problem in women at reproductive age. It can be divided into two broad categories based on pathophysiology; they are primary dysmenorrhea (menstrual pain without organic diseases) and secondary dysmenorrhea (menstrual pain associated with pelvic pathology; 1, 2). Primary dysmenorrhea happens when young girl's first experience the ovulatory cycles at puberty and its prevalence elevates during adolescence and reaches to its highest between 20 and 24 years and decreases progressively thereafter (3). Primary dysmenorrhea is characterized by cramp at lower abdominal pain which may radiate to lower back and is commonly associated with nausea, headache, fatigue and diarrhea (4). Incidence and prevalence of Primary dysmenorrhea were not clearly established in India. Prevalence of Primary dysmenorrhea varies from 33% to 79.67 % (5). There is a wide variation in the estimate of dysmenorrhea of studies around the world reporting range between 28% and 71.1% (6, 7). The responsible cause of primary dysmenorrhea is not well established. However, the causative factor is hyper-production of uterine prostaglandins, particularly of PGF2a and PGF2, which results in increased uterine tone, and high amplitude contractions, which in turn lead to uterine hypoxia and ischemia, which can cause pain and cramps. Women with dysmenorrhea have higher levels of prostaglandins, which are highest during the first two days of menstruation. Prostaglandins production is controlled by progesterone, when progesterone levels drop immediately prior to menstruation; prostaglandins level increases (8-10). The treatments for Primary dysmenorrhea include administration of hormonal treatments such as oral contraceptives or non-steroidal anti-inflammatory drugs (11). Non-pharmacological and minimally

invasive interventions for obtaining relief of dysmenorrhea symptoms are acupuncture, heat treatments, transcutaneous electrical nerve stimulation and relaxation techniques (12). Myofascial trigger points (MTrPs) in the lower abdominal region might cause the pain of primary dysmenorrhea. The myofascial trigger points, which are described as localized hypersensitive spots in a palpable taut band of muscles. These hyperirritable spots can be classified as active MTrPs when they produce spontaneous pain and when palpated and latent MTrPs do not produce spontaneous pain and are painful on palpation (13). Dry needling is a performed by using monofilament needle through the skin without introduction of any drug to stimulate MTrPs and connective tissue for management of Neuro musculoskeletal pain. Dry needling helps in deactivation of the MTrPs, decrease muscle tone and pain with increased range of motion in patients with musculoskeletal conditions (14). Carnets test is the key physical examination for diagnosing abdominal pain that arises from the structures within the abdominal wall. A positive test indicates that the pain is most likely in the abdominal wall and is not visceral in origin (15). Primary dysmenorrhea is the most common gynecological problem among adolescent females, and it is the most common reason of sickness absenteeism from school and work. Emotional and behavioral problems may increase menstrual cycle issues and dysmenorrhea. Due to the negative effects of dysmenorrhea on an individual's physiological status, health related quality of life might be disrupted among adolescent females. Managing dysmenorrhea with non-steroidal anti-inflammatory drugs (NSAIDS) and oral contraceptives is reported to be associated with side effects such as nausea, breast tenderness. Dry needling involves disruption of MTrPs, which is the probable cause of primary dysmenorrhea, which decreases the pain and improves quality of life. The pain relief could be instantaneous, and the effects could last long.

Procedure

Approval was obtained from the scientific research committee and Institutional Ethics Committee of Saveetha Medical College and Hospital, Saveetha University, Chennai. 40 subjects were selected as per inclusion and exclusion criteria. Women aged between 18 and 24 years, dysmenorrhea lasts for more than 6 months, dysmenorrhea for at least 2-3 days, numerical pain rating scale ranges from 3-7, Moos menstrual distress questionnaire with mild, moderate and strong grading's and subjects with regular menstrual cycle were included and patients with secondary dysmenorrhea like endometriosis, patients with other urinary, reproductive and metabolic disorders, patients with needle phobia, history of abnormal reaction to needling and patients who is on other hormone replacement therapies were excluded form study. The informed consent was signed by participants. The time taken for completion of the questionnaire was approximately 20 minutes. For this study, a questionnaire was given which was mainly used to evaluate behavioral and affective responses of adolescent girls through Moos Menstrual Distress Questionnaire (MMDQ). Carnet's test was used for after identifying the trigger points in abdominal muscles. Participants were divided into 2 groups (group A and group B) by simple randomization method. In group A, 20 subjects received dry needling for trigger points in rectus abdominal and external oblique along with self-abdominal stretching. The total number of sessions is 2 days per week for 2 weeks and during each session dry needling has to be given for 2 to 3 trigger points. In group B, 20 subjects were advised for conservative method using hot pack and were prescribed self-stretching exercises. Two therapists along with primary researcher were given the intervention and outcome was evaluated by other therapist who was not involved in the treatment session. Patients were followed up through phone calls. The following outcome measures were used for assessing menstrual symptoms; numerical pain rating scale and Moos menstrual distress questionnaire.

Needling procedure for rectus abdominis

The patient was made to comfortably lie down in a supine position on an examination couch and myofascial trigger point was confirmed by flat palpation and marked (16). After disinfecting the area with isopropyl ethyl alcohol, a 0.25 x 50 mm needle was angulated perpendicular to the MTrPs. The needle penetrates into skin and adipose tissue, and face initial resistance by deep fascia that overlies the muscle is penetrated. The needle is further advanced for a few millimeters to reach MTrPs and moved around slightly to elicit local twitch response (LTR).After eliciting the local twitching response, the needles are removed and disposed of using specific protocols for disposal of sharps (17). Other points if present in the rectus abdominis were treated similarly.

Needling procedure for external oblique

The subjects were positioned in lateral decubitus, which offers a benefit of letting the abdominal organs sag down so that the muscle can be easily targeted. Using 0.25 x 50 mm needle, a flat or pincer grasp is used to fix the point before inserting the needle (18). After the treatment, patients were briefed about the possibility of mild soreness that may last for a day.

RESULTS

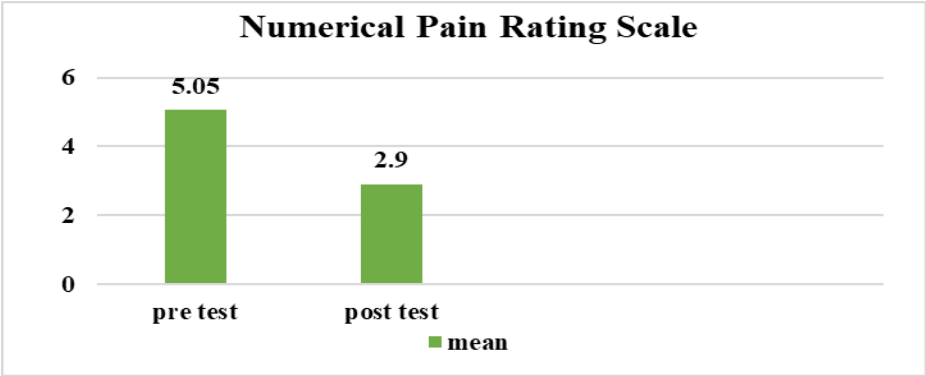

Fig. 1: The pre and post-test values of numerical pain rating scale in group A

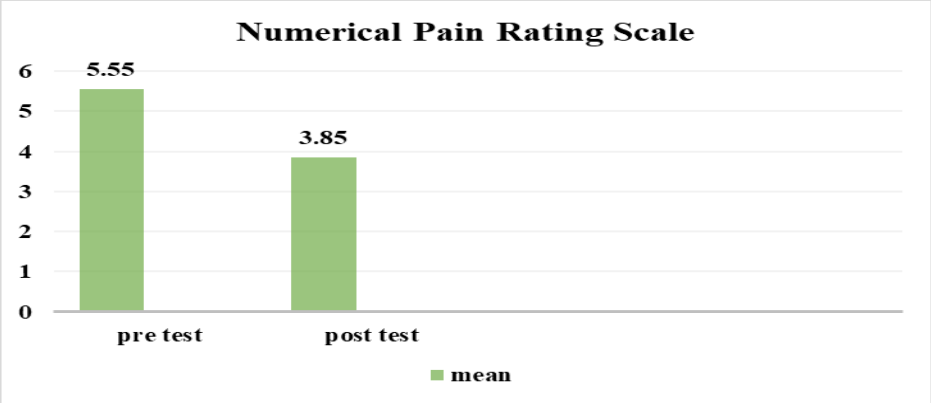

Fig. 2: The pre and post-test values of numerical pain rating scale in group B

Overall, 40 subjects were recruited in this study and twenty subjects were allocated in each group. All subjects completed the physical examination and the procedure. They were assessed by using numerical pain rating scale and moos menstrual distress questionnaire. The data analysis revealed that the results of this study were statistically significant. In numerical pain rating scale, the pretest and post-test mean, and standard deviation of group A was 5.05(1.28) and 2.9(1.13) respectively as shown in fig. 1. The statistical analysis showed that there was significant difference in between pre and posttest among the values ($p<0.0001$), while the pretest and post-test mean, and standard deviation values of group B was 5.55(1.388) and 3.85(1.06) respectively as shown in fig. 2. The statistical analysis shows that there was a significant difference in between the pretest and posttest with the p-values ($p<0.0001$). In between the post-test mean and standard deviation values of NPRS of both group A and group B are 2.19(1.13) and 3.85(1.06) respectively and there was a significant difference among the values of ($p<0.0093$). In Moos menstrual distress questionnaire (MMDQ), the pretest and post-test mean, and standard deviation of group A was 7.2(17.3) and 39.5(9.39) respectively and the statistical analysis showed that there was significant difference among the values of ($p<0.0001$) as shown in fig. 3. While the pretest and post-test mean, and standard deviation of group B was 64.45(15.13) and 49.5(12.6) respectively and the significant difference among the values of ($p<0.0016$) as shown in fig. 4. In between the posttest mean and standard deviation of MMDQ of both group A and group B are 39.5(9.39) and 49.5(12.6) respectively and there was a significant difference among the values of ($p<0.0071$).

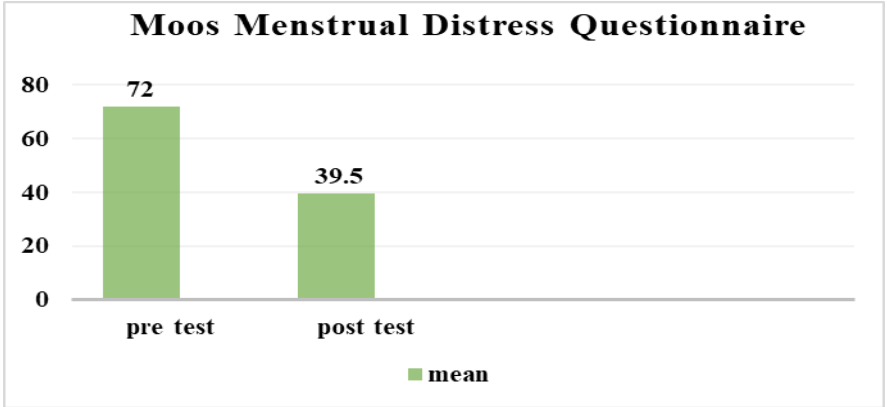

Fig. 3: The pre and post-test values of Moos menstrual distress questionnaire in group A

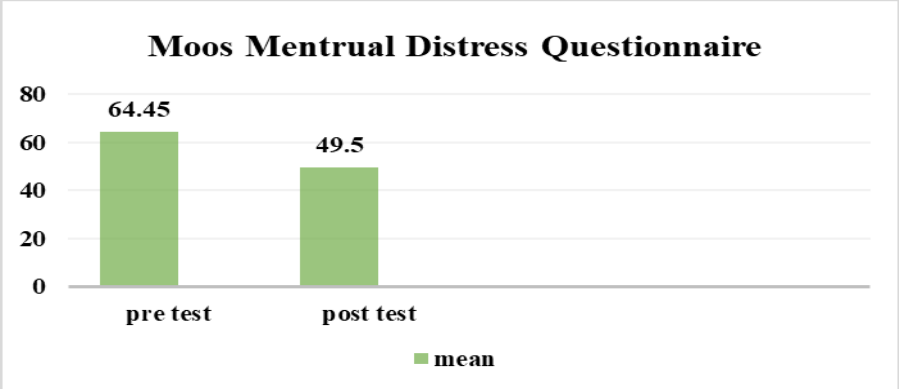

Fig. 4: The Pre and Post-Test values of Moos menstrual distress questionnaire in group B

DISCUSSION

We found that treatment of primary dysmenorrhea with dry needling to MTrPs in abdominal muscles, together with abdominal self-stretching exercises demonstrates 100% effectiveness. Dry needling given for MTrPs, which are a highly sensitive in the lower abdominal muscles, can relieve the menstrual cramps but not associated symptoms such as nausea, vomiting and diarrhea (19). Conventionally the known cause for primary dysmenorrhea is a high plasma level of prostaglandin produced by endometrium during menstrual cycle. Since dry needling treatment can inactivate MTrPs, we speculated that a high level of prostaglandin might trigger activation of latent MTrPs. After menstruation, the concentration of prostaglandin in the blood decreases to normal, the activated MTrPs become latent and pain is relieved. This hypothesis requires further research. Dry needling will decrease pain, spasm, and improving functional outcomes (20). Pereault *et al.*, described that the recovery could be due to reduction of pain substances and biochemical like calcitonin gene related peptide and P substance. The positive biochemical change could be due to local vasodilation after dry needling (21). Studies proven that therapeutic exercise and physical activity can reduced incidence of dysmenorrhea. Increase in blood flow and metabolism of the uterus during exercise maybe effective in reduction of symptoms. Therapeutic exercises can increase the secretion of endorphins from the brain and in turn raise the pain thresh hold of the body (14). Julie brown *et al.* showed that exercise would reduce the Moos menstrual distress questionnaire score during menstrual phase. The result of this study shows a great significant reduction in menstrual symptoms in group A treated with dry needling. Most of the subjects used to self-medicate themselves with either analgesics or anti spasmodic. Only 3.3% subjects were seeking doctor's advice. Some physiotherapy interventions could consider for primary dysmenorrhea includes heat, Yoga, Transcutaneous electrical stimulation (4). Shahr-jerdy suggested that performing 8 weeks of selected stretching exercises reduces pain intensity, diminishes pain duration, and decreases consumption of analgesics in students with moderate to severe primary dysmenorrheal (18).

CONCLUSION

This study shows the significant improvement by giving dry needling along self-stretching exercise comparing to conservative management like heat application and self-stretching exercises in primary dysmenorrhea subjects.

CONFLICT OF INTEREST

This study has no conflict of Interest.

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