



Effect of knee-to-chest position versus pelvic rocking exercise on primary dysmenorrhea in non-exercising females at the end of 4 weeks: A randomized control trial

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Abstract

Aim: This study aimed to compare the effectiveness of Knee-to-Chest Position versus Pelvic Rocking Exercise on pain in primary dysmenorrhea in non-exercising females at the end of four weeks.

Method: Screening of 60 non-exercising females aged between 18-25 years having primary dysmenorrhea was done for the study based on inclusion and exclusion criteria. They were divided into 2 groups. Group A received Knee-to-Chest Position and Group B received Pelvic Rocking Exercise. Outcome measure was VAS for pain. Measurements were recorded before and after the end of the treatment period on the first day of menstrual cycle.

Statistical Tool: Pre and Post Data Analysis for VAS was done using Paired t-test for both Group A and Group B. Group A and Group B inter group analysis was done using Unpaired t-test.

Results: The comparison between pretreatment and posttreatment outcome measures indicated that both groups had significant improvement on pain. However Knee-to-Chest Position proved to be more effective on pain (p value = <0.001) than Pelvic Rocking Exercise.

Conclusion: This study concludes that Knee-to-Chest Position is more effective than Pelvic Rocking Exercise on pain in primary dysmenorrhea in non-exercising females at the end of four weeks.

Keywords: non-exercising females, primary dysmenorrhea, knee-to-chest position, pelvic rocking exercise

1. Introduction

A severe, painful, cramping sensation in the lower abdomen is defined as painful menstruation or Dysmenorrhea.

Dysmenorrhea is often accompanied by other symptoms such as nausea, headache, sweating, vomiting, and diarrhoea.

Approximately 67-90% of women suffer from dysmenorrhea during their reproductive age.

There are two types of dysmenorrhea:

1. Primary dysmenorrhea
2. Secondary dysmenorrhea.

Primary dysmenorrhea always first occurs in women after their ovulatory cycles become established, it refers to pain with no obvious pathological pelvic disease. The pain is felt over the lower abdomen and sacral region during this. The pain begins few hours before or after the onset of menstruation and lasts for 24-48 hours.

It has a large impact on activities of daily life, as it leads to disability in most of the adolescent girls, such as inability to concentrate on their work or studies, inability to perform in their academic activities like physical training or sports.

Females with dysmenorrhea have higher levels of PGE₂ and PGF₂. The prostaglandins play an important role in the pathogenesis of dysmenorrhea. Massive production of Prostaglandins during menstruation stimulates cervical narrowing and increases vasopressin release leading to ischemia and pain. This may be a significant factor in

inducing uterine hypersensitivity, reducing uterine blood flow, uterine hyper contractility and hyper sensitizing the pain fibres causing primary dysmenorrhea.

Primary dysmenorrhea reportedly stops spontaneously after 1-3 years; however sometimes it is possible to continue until childbirth.

Knee-To-Chest Position is an intervention to relieve pain apart from drugs, improvement is due to increase in blood flow and metabolism of uterus during exercise which may be effective in the reduction of dysmenorrheal symptoms.

Pelvic Rocking Exercise helps in reducing pain, relieving stress, and improving health. Women who exercise shows less severe dysmenorrhea and greater positive effects than women who are sedentary

Need of Study

A greater prevalence of primary dysmenorrhea was generally observed in young women with estimates ranging from 67%-90% for those aged 18-24 years.

Few studies have been done on effects of knee-to-chest position on primary dysmenorrhea among adolescent girls:^[3]

Few studies have been done on effects of pelvic rocking exercise on primary dysmenorrhea among adolescent girls:^[4, 5]

There is lack of evidences and studies which shows comparison between Knee-to-chest position and Pelvic rocking exercise on primary dysmenorrhea among

adolescent girls.

Therefore, the purpose of this study is an effort to compare the effect of Knee-to-chest position and Pelvic rocking exercise on primary dysmenorrhea among adolescent girls.

Aim

To compare the effectiveness of Knee-to-chest position and Pelvic rocking exercise on pain in primary dysmenorrhea in non-exercising female at the end of 4 weeks.

Objectives

1. To study the effect of Knee-to-chest position on pain in primary dysmenorrhea at the end of 4 weeks.
2. To study the effect of Pelvic rocking exercise on pain in primary dysmenorrhea at the end of 4 weeks.
3. To compare the effects of Knee-to-chest position and Pelvic rocking exercise on pain in primary dysmenorrhea at the end of 4 weeks.

Hypothesis

Null hypothesis: There will be no difference between Knee-to-chest position and Pelvic rocking exercise on pain with primary dysmenorrhea.

Alternate hypothesis

H1: Knee-to-chest position will be more effective than Pelvic rocking exercise on pain with primary dysmenorrhea.

H2: Pelvic rocking exercise will be more effective than Knee-to-chest position on pain with primary dysmenorrhea.

Review of literature

1. Hong Ju, Mark Jones, and Gita Mishra. The Prevalance and Risk Factors of Dysmenorrhea. From longitudinal or population data, this review has confirmed the following:
Dysmenorrhea is inversely related to age, parity or number of live births and oral contraception use; Dysmenorrhea is positively associated with stress related to both work and general life, as well as with family history of dysmenorrhea
2. Direkvand - Moghadam A (MSC) and Khosravi A (MSC, PhD). Comparison of Verbal Multidimensional Scoring System (VMS) with Visual Analogue Scale (VAS).
This study suggest that both VAS and VMS are appropriate for evaluating purpose though further clinical trials are recommended to look at in details ability of this two systems in another trials..
3. Darpita Patel, Dr. Anuradh Sutar (PT), Dr Snehal Ghodey (PT). Effect of Knee-to-Chest Position on Primary Dysmenorrhea in School Going Girls
The following is an experimental study carried out by purposive sampling. The study was conducted on students of school going between age group of 12-15 years. The study concluded that the Knee to Chest position is effective in reducing pain and discomforts of primary dysmenorrhea.
4. Anju Verma. A Randomized Control Trial To Assess And Evaluate The Effectiveness Of Pelvic Rocking

Exercises In Reducing Dysmenorrhea Among Girls Of Selected Colleges Of Nursing In New Delhi.

The study concluded that the exercise can decrease the duration and severity of dysmenorrhea and also using of the sedative tablets among adolescent girls.

5. Jyoti Kapoor, Navpreet Kaur, Meenu Sharma, and Sarbjot Kaur.

A study to assess the effectiveness of pelvic rocking exercises on dysmenorrhea among adolescent girls.

Purposive sampling technique was used to select the sample. The comparison of the pre and post-interventional dysmenorrhea was found to be statistically significant. Therefore, it was concluded that the pelvic rocking exercises had significant effect on dysmenorrhea.

Methodology

Sample size: 60

Study design: Comparative

Sampling method: Purposive sampling

Study population: Non-exercising females with Primary dysmenorrhea 18-24 years of age

Study setting: Colleges and hostels in and around Pune

Study duration: 6 months

Treatment duration: 4 weeks

Criteria

▪ Inclusion criteria

1. Females with Primary dysmenorrhea.
2. Non-exercising females.
3. 18-24 years of age.
4. VAS score: 3-7

▪ Exclusion criteria

1. Females with Secondary dysmenorrhea.
2. Females taking analgesics during menstruation.
3. Married women.
4. Gynaecological disorders.
5. Females taking Oral contraceptive pills.
6. Recent fractures
7. Prolapse intervertebral disc

Materials

- Pen
- Paper
- Mat
- Consent form
- Visual analogue scale

Outcome Measures

Visual Analogue Scale (VAS)

The VAS is considered by some to be one of the best measures of pain intensity the VAS is a self-reported measurement consisting of a vertical or horizontal line with extreme anchors of 'no pain' to 'extreme pain'. This line represents a continuum of pain intensity and is most often 10 cm in length. The patient is asked to mark their perceived level of pain intensity (for a specified time frame) on the line. The examiner scores the instrument by measuring the distance, in millimetres, from the 'no pain' anchor to the mark, which the patient identified as their level of pain. Test-retest reliability has been reported to be high for the VAS (ICC=0.71-0.99).

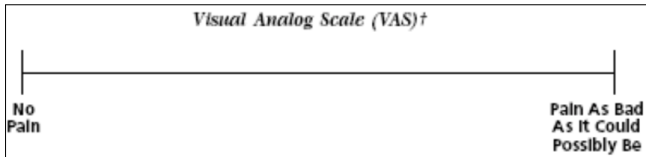


Fig 1

Procedure

- Ethical clearance was taken from P.E.S Modern College of Physiotherapy, Shivajinagar, Pune-05.
- Selection of subjects were based on inclusion and exclusion criteria.
- Detailed instructions were given to the patients about the study.
- Consent was taken from the patients.
- Subjects were divided in two groups-30 each by chit method.
- Group A and Group B were explained about the procedure.
- Pre-intervention VAS score was taken.

Group A: Knee-to-Chest position

Patient position: Supine lying Therapist position: by the side of patient Technique:

1. The patient was in supine position.
2. With one leg extended and the other leg pulled towards the chest while keeping the shoulders relax.
3. The leg can be grabbed through holding at the shin or back of the knee (hamstrings).
4. This was performed for the other leg as well or with both the legs together.
5. The position is to be performed from the second day of menstrual cycle with 10 seconds hold and 10 repetitions

in one session.

6. Number of sessions per week- 5sessions per week.
7. Treatment duration: 4 weeks



Fig 2: Knee-to-Chest Position

Group B: Pelvic Rocking Exercise

Patient position: quadruped position

Therapist position: by the side of the patient

Technique:

1. The patient was in quadruped position
2. And asked to look down, arch the back and hold this for 5 seconds.
3. Then she was asked to look up which gives a hump over the back and hold this for 5 seconds.
4. This has to be repeated 10 times in a session
5. Number of sessions per week: 5 sessions per week
6. Treatment duration: 4 weeks



Fig 3: Pelvic Rocking Exercise

Data Analysis

- Improvement in pain assessed by VAS.
- The data was entered in Excel spread sheet, tabulated and subjected to Statistical Analysis.
- The data was entered and analyzed using Primer of Biostatistics version 7.0 checking effectiveness of Knee-to-Chest position and Pelvic Rocking exercise on pain in non-exercising females with primary

dysmenorrhea at the end of four weeks.

Statistical Analysis

- Data analysis was done for Group A and Group B using outcome measures Visual Analogue Scale (VAS).
- Pre and Post Data Analysis for VAS was done using Paired t-test for both Group A and Group B.
- Group A and Group B inter group analysis was done using Unpaired t-test.

Table 1: Intra Group Vas, (Group A and Group B)

Outcome Measure/ Group	Pre Treatment Mean/Sd	Post Treatment Mean/Sd	P value	T value	Result
Vas (A)	5.23 ± 1.13	2.66 ± 1.70	<0.0001	14.19	Highly Significant
Vas (B)	4.94 ± 1.39	4.13 ± 1.34	<0.0001	8.33	Highly Significant

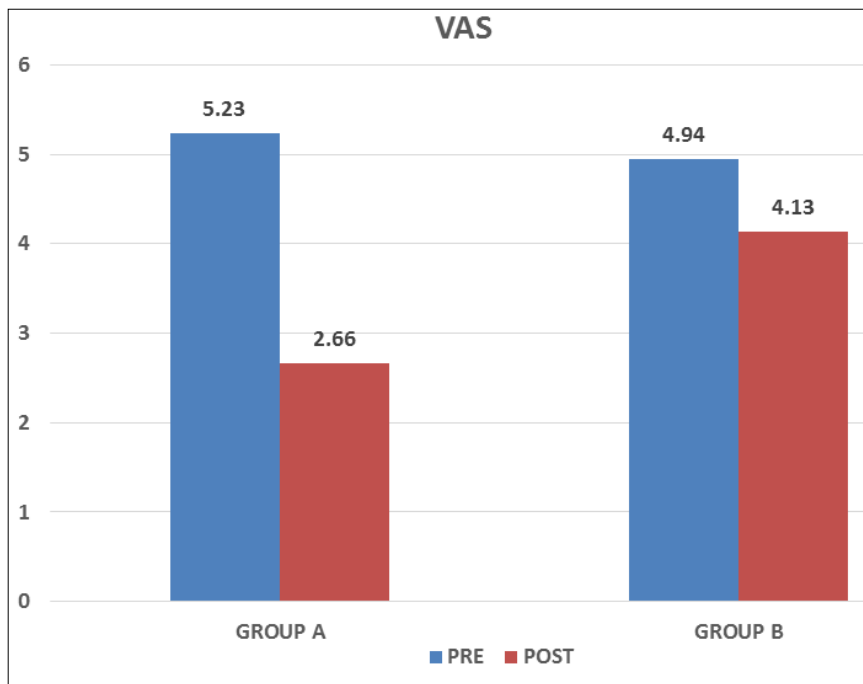


Fig 4

Table 2: Inter Group Vas (Group A and Group B)

Outcome Measure/ Group	Group A Mean/SD	Group B Mean/SD	P Value	T Value	Result
VAS	2.57±1.74	3.99±1.52	<0.0001	-3.31	Highly Significant

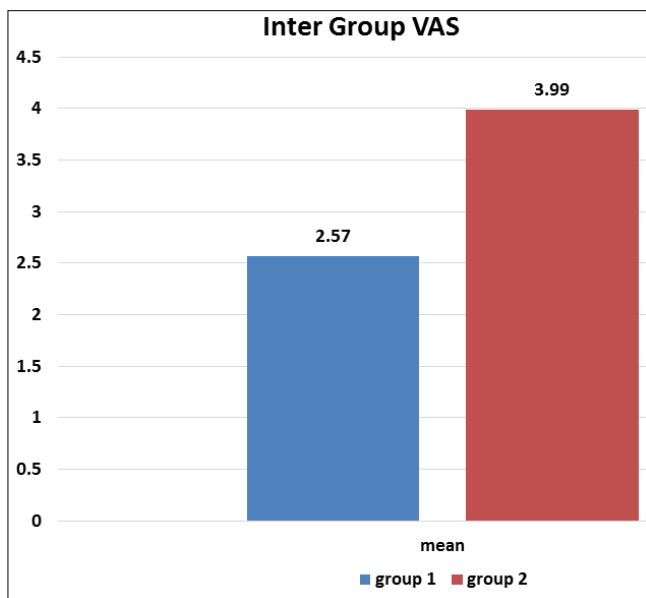


Fig 2

Results

- The exercise techniques used in this study are Knee-to-chest (Group A) and Pelvic Rocking (Group B) for pain in non-exercising females with Primary dysmenorrhea.
- The findings of this study revealed significant difference in reduction of pain (VAS) between Group A and Group B with mean values of 2.56 and 0.85(t value= 8.5 and p value= 0.000) respectively.

Discussion

- Primary dysmenorrhea refers to pain with no obvious pathological pelvic disease and almost always first occurs in women after their ovulatory cycles become established. The prostaglandins plays an important role in the pathogenesis of dysmenorrhea.
- The present study was conducted to study the effect of Knee-to-Chest position and Pelvic Rocking exercise on pain in non-exercising females with primary dysmenorrhea.
- The study included 60 subjects within age group of 18 to 25 years of age the mean ages being 21.54±1.89 and 21.25±1.99 of Group A and Group B respectively, there were four dropouts from the study.
- Groups were divided into half by Chit method. Group A was given Knee-to-Chest position and Group B was given Pelvic Rocking exercise.
- The study duration was four weeks and exercises were given 5 days per week.
- When pre and post analysis was done for Group A for which Knee-to-Chest position was given, data was analyzed using paired t-test for VAS which showed statistical difference in the VAS score which showed the study concluded by K. Renuka, Dr. S. Jeyagowri that Knee-to-Chest position has been found to reduce menstrual discomfort through increase in vasodilatation, and decrease in ischemia, release of endogenous opiates, specially beta endorphins and suppression of prostaglandins and shutting of blood

flow from viscera resulting in less pelvic congestion, also maintains the hormonal balance. This reduces the pain.

- So stretching exercise helps in smoothing an aching back, relieving pain, improving flexibility, restoring mobility increasing circulation in the spinal tissues and joints, relaxing tense uterine muscles and maintaining good abdominal tone
- When pre and post analysis was done for Group B for which Pelvic Rocking exercise, data was analyzed using paired t-test for VAS which showed statistical difference in the VAS score which showed the study concluded by Jyoti Kapoor *et al* 2017 in their study concluded that exercise helps in reducing pain, relieving stress, and improving health. Women who exercise shows less severe dysmenorrhea and greater positive effects than women who are sedentary.
- Knee-to-chest position (stretching exercise) is more effective than the Pelvic Rocking exercise (core-strengthening) which showed the study concluded by Rajalakshmi V *et al*(2016) that the stretching exercise are more effective in reducing the dysmenorrheal pain when compared to core strengthening exercises in female Physiotherapy students with primary dysmenorrhea.
- Inter group analysis was done using unpaired t test for VAS which showed that both treatment were individually effective in improving pain scores.
- Knee-to-Chest position (Group A) was proved to be more effective than Pelvic Rocking exercise (Group B) according to the statistical analysis.
- Thus, the alternate hypothesis (H1) is accepted for improving pain in non-exercising females with primary dysmenorrhea.

Conclusion

- This study concludes that Knee-to-Chest position is more effective than Pelvic rocking exercise in improving pain in non-exercising females with primary dysmenorrhea.

Limitation

- Absence of follow up after the duration of study ended.
- Sample size was less.

Future Scope

- Study can be concluded with larger sample size and duration.
- Study can also be aimed at treating females with dysmenorrhea due to secondary conditions.

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