



Research article

Effects of pelvic clock exercise on pelvic alignment in females with primary dysmenorrhoea

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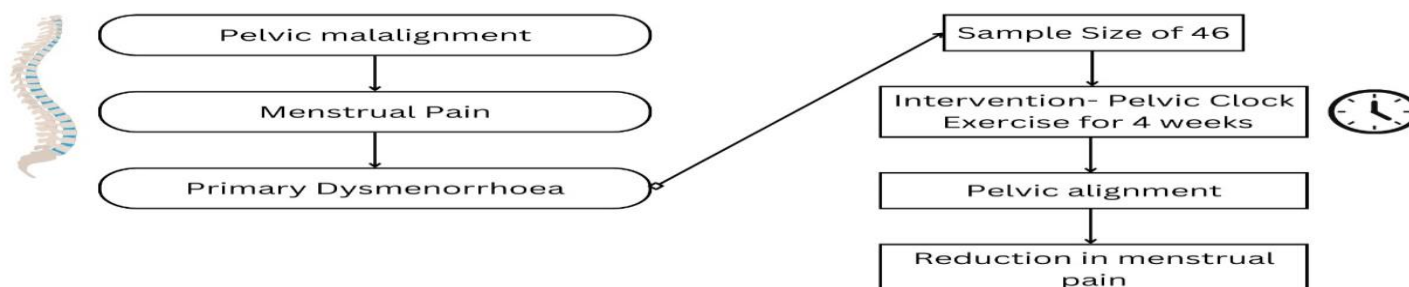
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ABSTRACT

Pelvic changes are prevalent in girls with dysmenorrhoea. Pelvic clock exercise helps in sensorimotor training of pelvis. The purpose of this study was to determine the effects of pelvic clock exercise on pelvic parameters in dysmenorrhoea. 46 females were included in the study to perform pelvic clock exercise for 4 weeks. The baseline data was recorded before and after 4 weeks. The pelvic parameters were checked with pelvic inclinometer and pain using VAS. The Wilcoxon signed rank test was used to compare pelvic tilt, pelvic torsion, and pain. Comparison of pelvic parameters before and after 4 weeks showed that pelvic clock exercise reduced pelvic tilt and pelvic torsion. Current study concluded pelvic clock exercise to be beneficial in improving the pelvic alignment and thus reducing pain in females with dysmenorrhoea.



Keywords: Dysmenorrhea, Pelvic tilt, Pelvic torsion, Pain, Pelvic clock exercise.

INTRODUCTION

Dysmenorrhoea is a cyclic chronic pain following menstrual cycle in fertile age women^[1]. Women with dysmenorrhea may have biomechanical, musculoskeletal, and postural alterations^[2]. The limited spinal motion results from mechanical dysfunction in the vertebrae. Thoracolumbar outflow to arteries feeding the pelvic organ may be impacted, which could cause vasoconstriction and cause dysmenorrhea^[3]. The tension in nerves and ligaments connecting to sacral vertebrae and uterus is the root of nociception^[4]. The primary dysmenorrhea may be caused due to incongruity amongst pelvic muscles and soft tissue^[5].

This musculoskeletal incongruity might lead to alter the structure and function in the bodily framework as well as shift of uterine position, which would cause painful menses. Kim hypothesized that pelvic and spinal malalignment induces anatomical and functional adjustments, particularly uterus, which might raise cyclic chronic pain^[6]. Kim et al. confirmed a positive relationship between pelvic malalignment and dysmenorrhea, that the motions of lumbo-sacral vertebrae is abnormally insufficient in females having dysmenorrhea, the fluid in pelvis surges and uterus contraction advances to intensification of menstrual pain^[4].

The mismatch lumbar-pelvic parameters may affect the musculoskeletal chain of the pelvic cavity, which adverse uterine position, and may be one of the causes of dysmenorrhea in some women [5]. The probable physiological explanation is that the modifications found in females having chronic pelvic pain due to a vicious pain cycle occur due to defensive motion model caused by pain perception and antalgic postures established over time [6].

Due to posture deficit, there might be a significant reduction in blood flow and lymphatic drainage of tissue fluids, which in turn causes pelvic floor muscle tension and rotation of lower spine [7]. Pelvic clock exercise was invented by Feldenkrais, used for pelvic motion training as they improve proprioceptive awareness and hip joint, lumbar area, and pelvis mobility [8]. Pelvic clock improves pelvic control and can be used for neuromuscular education of pelvic and lumbar musculature [9]. Dysmenorrhoeic women experience menstrual pain which might be due to pelvic misalignment causing uterine retroversion and hence the menstrual pain. So pelvic clock exercise might correct the malalignment and thus cause pain relief.

MATERIALS AND METHODS

The study was approved by the IECBH, DY Patil Medical College, Navi Mumbai. Subjects were screened for inclusion and exclusion criteria. Informed consent was taken before inclusion of the patients in the study.

Participants were included based on the inclusion criteria. Demographic details and written consent were collected from the participants. All the participants were asked to fill the demographic details and VAS score was taken. Pelvic tilt and pelvic torsion were checked with inclinometer.

Participants had to perform pelvic clock protocol for 4 weeks. After 4 weeks, VAS score was taken from the participants. Pelvic tilt and pelvic torsion were checked with pelvic inclinometer. The difference in the pre and post intervention scores were compared to check the effects of pelvic clock exercise in females with primary dysmenorrhea.

Pelvic tilt angle: Right and left pelvic tilt was measured using a pelvic inclinometer. It consists of two freely move- able arms. One end of the arm is placed on ASIS and other end is placed on PSIS and the angle is measured.

Pelvic torsion: Pelvic torsion is measured as the difference between right and left pelvic tilt.

Pelvic Clock exercise

Subject in crook lying position, ask her to imagine clock face on abdomen. 12 o' clock is pointed towards umbilicus and 6 o'clock is pointed towards pubic symphysis.

Clockwise and Counter-clockwise

Movement in a clockwise direction from 12 to 3 to 6 to 9 and then back to 12 o' clock. Perform 25 times.

Exercise 12-6 with knees flexed

Gentle movements back and forth between 12 o' and 6 o' clock. Perform 25 times.

Exercise 3-9 with knees flexed

Gentle movement s back and forth between 3 0' and 9 o' clock. Perform 25 times.

RESULTS AND DISCUSSION

Table 1: Descriptive analysis of demographic details

	Sample Size (N)	Mean	Standard Deviation
Age	46	22.70	1.965
Height		156.54878	24.221650
Weight		59.40870	13.398969
BMI		382.23916	2433.609438
Number of days per Cycle		4.54	0.936

Table 2: Mean values of VAS, right pelvic tilt, left pelvic tilt and pelvic torsion.

	Mean + Standard Deviation
VAS	6.48±1.08
Right pelvic tilt	9.76±1.286
Left pelvic tilt	9.59±1.127
Pelvic torsion	1.5±0.499

Table 3: Comparison of pre and post values of VAS, right pelvic tilt, left pelvic tilt and pelvic torsion.

	PRE	POST	p
VAS	6.48±1.08	3.98±1.31	0.000
R Pelvic Tilt	9.76±1.286	8.78±1.26	0.000
L Pelvic Tilt	9.59±1.127	8.76±1.25	0.000
Pelvic Torsion	1.5±0.499	0.25±0.147	0.000

Biomechanical changes are prevalent in females with dysmenorrhea. The study focuses to examine effects of pelvic clock exercise in females on pelvic alignment with primary dysmenorrhea.

Pelvic clock exercises are used by Feldenkrais practitioners, which focuses on functional integration and awareness through movement. Pelvic clock exercises are used for sensorimotor training of pelvic musculature [10].

Sensorimotor training assists in muscle co-ordination and motor programming and maximizes the velocity of muscle activation. Sensorimotor training improves pelvic stability by enhancing gluteal muscle activation and better trunk control. In a study conducted by Ludwig, sensorimotor training proved to be effective to reduce pelvic tilt along with strength training. They stated that the sensorimotor exercises improved the processing of the sensory input and could have enhanced the intermuscular co-ordination [11]. Pelvic clock exercise helps in conscious activation of the targeted muscles thus leading to improvement in position of pelvis.

Lower pelvic incidence and sacral slope may result in a smaller pelvic cavity and uterine retroversion. Excessive retroversion may restrict the flow of uterine fluids and menstrual blood, causing a localized inflammatory response that will drive uterine contraction and result in dysmenorrhea [6]. Proctor et al. hypothesized that the

mechanical dysfunction in the vertebrae, particularly S2 to S4 and T10 to L2 causes decreased spinal mobility. This affects the sympathetic nerve supply to the blood vessels supplying the pelvic organ which causes vasoconstriction leading to dysmenorrhea [3]. Due to the abnormal insufficiency of movement of the lumbar-sacral vertebrae, fluid surges within the pelvis as well as contraction of the uterus leading to the strength of the menstrual pain [4].

Decreased lumbopelvic mobility causes reduction in flexibility of the fascia and ligaments thus causing change in the uterus location [5]. In a case study conducted by Amber Huener, pelvic clock exercise used as muscle energy techniques were proven beneficial in short term relief of sacro-iliac joint dysfunction [12].

Dysmenorrhoea causes weakness of core causing changes in the transverse abdominal muscle thickness [5]. There is facilitation, concentric activation and stabilization of the core muscles occurring due to the pelvic clocks [13]. Pelvic clock exercise strengthens the weak abdominals thus preventing low back pain.

A study conducted by Arien, proved that the Feldenkrais method is effective in reducing pain and in adults experiencing low back pain. Due to the Feldenkrais method's emphasis on performing motions slowly and with little muscular effort, the proprioception and kinesthesia were significantly improved, which led to a reduction in pain perception. Transverse multifidus muscle and external oblique muscle activity was found prominent in Feldenkrais method, thus reducing low back pain [13].

The pelvic tilts performed in pelvic clock exercise could be reducing the strain on the lumbar spine, therefore decreasing the sympathetic activity, and hence causing pain reduction. Interspinous ligaments are less stressed because of the pelvic tilt. It is possible that the erector spinae are relaxing post-isometrically, which would lessen pain. Pelvic tilts cause spinal segment mobility, which stimulates cutaneous sensations and may alter the activity of internal organs, alleviating dysmenorrhea. The reduction in pain during menstruation might be due to changes in pelvic parameters after 4 weeks of protocol.

CONCLUSION

This study aimed to investigate the effects of pelvic clock exercise on pelvic alignment in females with primary dysmenorrhoea. Consequently, pelvic clock exercise positively affects pelvic alignment and is an effective intervention for improving menstrual pain in females with primary dysmenorrhoea.

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