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The effect of specific exercises on back pain during the third trimester in Primigravida population

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Abstract

Background: Back pain is the most common musculoskeletal discomfort among Primigravida females. The back pain tends to increase as the gestational age increases due to the physiological and biomechanical changes that occur to accommodate the growing foetus. Primigravida females compared with multigravida need longer adaptation time for physiological and psychological changes of pregnancy as their body is experiencing it for the first time.

Methods: This research included 30 samples between the ages of 21-35 years with self-reported back pain during the third trimester. Subjects performed a structured exercise program designed for back pain during the third trimester under the supervision of a trained physiotherapist. Pre and post-treatment VAS were reported and compared.

Results: The result demonstrated that there was difference in pre and post-VAS. Exercise plays a significant role in reducing the intensity of back pain in this population.

Conclusion: Exercise plays a crucial role in ameliorating the discomforts of pregnancy during third trimester in primigravida females. So an effort should be made to add the exercises during third trimester to reduce the discomfort of back pain in primigravida females.

Keywords: Pregnancy, back pain, third trimester, primigravida females, exercises

Introduction

Back pain is the most common musculoskeletal discomfort among Primigravida females^[1, 8]. According to studies, 50 to 70 % of Primigravida females experience back pain during the third trimester of pregnancy^[2]. The prevalence of back pain during the first trimester was 16.7%, second trimester was 31.3%, and third trimester was 53%^[3, 4]. Back pain is the pain or unpleasant sensation in the region of back mostly between 12th rib and gluteal line. The back pain tends to increase as the gestational age increases due to the physiological and biomechanical changes that occur to accommodate the growing fetus^[5, 6]. The back pain increases 69% by the end of 28th week^[11]

Factors that contribute to back pain in primigravida females during the third trimester are weight gain, postural changes, hormonal changes, muscle imbalances, stress, and fatigue^[2, 3]. During pregnancy, the body releases hormones such as relaxin, which relaxes the ligaments and joints for preparation of childbirth. However, this hormonal relaxation can also affect the stability of the spine and pelvic joints^[9]. As the pregnancy advances, growing uterus results in increased lordosis and anterior shift in the center of gravity causes strain on back muscles and ligaments which creates constant tension in lower lumbar & pelvis region^[11].

Growing fetus continuously creates pressure on internal structures and neurovascular bundle to accommodate these changes undue shortening and lengthening of soft tissue occurs^[7, 10]. Abdominal muscles elongate, stretch, and become weak whereas back muscles become short and tight resulting in reduced mobility of the pelvis making it difficult for the baby to engage in the pelvis which contributes to complaint of back pain during third trimester^[12]. Lower back pain during pregnancy if not treated can be at risk of becoming chronic back pain that is difficult to cure. Low back pain not only drains the patient physically and mentally but also interferes with the activities of daily living^[13].

Primigravida females compared with multigravida females need longer adaptation time for physiological and psychological changes of pregnancy as their body is experiencing it for the first time.

Due to the limitations and potential risks of pharmacological interventions during pregnancy, exercise plays an important role. The exercise helps the women to adjust with the physical changes throughout the pregnancy [2, 14]. Supervised exercise program consisting of stretching, strengthening and relaxation exercises has been shown to have several benefits during pregnancy including improved mobility, reduced pain, improved overall fitness and reduced risk of complications [9].

Exercises with Swiss ball helps to ease off the load of spine and pelvis, stimulates the postural reflex and strengthen the muscles of back and abdomen [10]. The present study aimed to focus on the effect of exercises on back pain during third trimester in primigravida females.

Materials and Methods

This research was included in a quasi-experimental research type which was by one group pre and post-treatment design approach, which aimed to determine the effect of specific exercises on the intensity of back pain during third trimester in primigravida population.

Sample design: convenient sampling method

Study setting: Pacific Medical College and Hospital, Udaipur Raj.

Materials used: Swiss ball, exercise mat, chair, consent form.

Sample size: It included 30 primigravida females fulfilling all the inclusion criteria.

Ethical Clearance

This study was approved by the Institutional Ethics Committee of Pacific Medical College and Hospital (code of ethics: IEC/244/2022).

Inclusion Criteria

- Primigravida females of age group 21-35 years, with gestation period of 26-36 weeks.
- Females with self-reported back pain during the third trimester of pregnancy.
- Participants who are able to understand the study procedures and provide informed consent.

Exclusion Criteria

- Pregnancy-related complications such as multiple pregnancies (e.g., twins or triplets).
- Participants with pre-existing chronic low back pain.
- Contraindications of exercises during pregnancy such as incompetent cervix, preeclampsia, persistent second-

trimester bleeding, placental abruption, foetal distress, placenta previa, threatened pre-term labour, abnormal foetal presentation, recurrent miscarriage, intrauterine growth retardation, dilated cervix.

- Extreme obesity.
- Weight gain during pregnancy > 25kg.
- Participants who do not have sufficient language proficiency to understand and respond to the study assessments and interventions will be excluded.

Informed consent was obtained from each participant. The demographic assessment included age, weight, lifestyle, etc. Subjects performed the exercises 3 times a week for 45 minutes, including 5-10 minutes of warm and cool-down sessions.

The exercises included diaphragmatic breathing, seated pelvic circles, side-to-side rocking, pelvic tilts on the ball, seated groin stretch, and modified squats. 8-10 repetitions of each exercise were performed.

All subjects Performed structured exercise program designed for back pain during third trimester under the supervision of a trained physiotherapist. The pre and post-VAS were reported. The statistical tests used were mean, SD, and t-test

Results

Table 1 represents the distribution of Age groups among the study population. 26-30 years of age is most common which includes 60% study population.

The intensity of Back pain reduces significantly after exercise. Pew test mean VAS was 7.53 ± 1.46 which reduces to 2.00 ± 1.44 post-treatment (Table 2). The treatment duration varies between 4 to 12 weeks according to the initiation of pain during third trimester.

Table 3 compared the pre and post-VAS between age groups, which indicated that exercise showed better results for 21-30 years of age as compared to 31-35 years. (fig.1)

Table 4 indicates that 9-12 weeks of treatment had a more prominent result when compared with 1-4 weeks of treatment, which proves that the longer the duration, the better the prognosis. (Figure 2).

Table 1: Distribution of age group

Age (yrs.)	N	%
21-25	4	13.33%
26-30	18	60.00%
31-35	8	26.67%
Total	30	100.00%

Table: 2 Comparison of pre and post treatment vas

VAS	N	Mean	SD	Std. Error	Mean Diff	T	P	Sig.
Pre-test	30	7.53	1.46	0.27	5.53	21.07	< 0.001	HS
Post-test	30	2.00	1.44	0.26				

Table 3: Comparison of vas scores with respect to age

Age group	Pre		Post		Mean Diff.	T	P	Sig.
	Mean	SD	Mean	SD				
21-25 yrs	7.00	0.82	1.50	1.29	5.50	19.71	< 0.001	HS
26-30 yrs	7.61	1.69	1.83	1.20	5.78	15.27	< 0.001	HS
31-35 yrs	7.63	1.19	2.63	1.92	5.00	12.12	< 0.001	HS

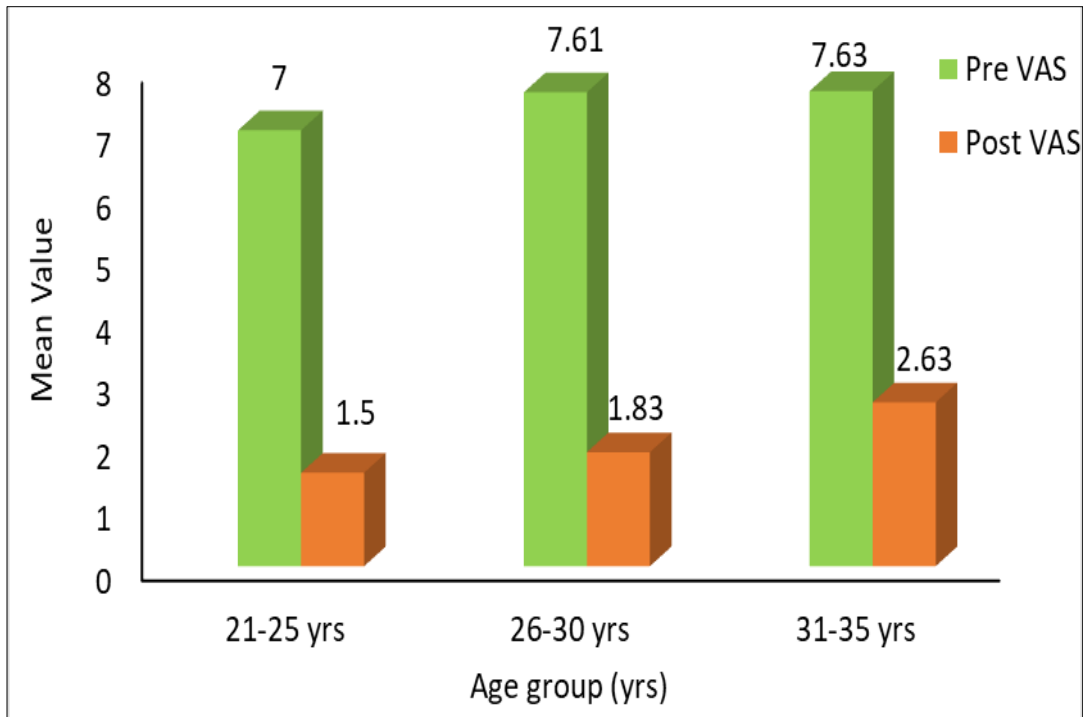


Fig 1: Pre and post VAS

Table 4: Comparison of VAS scores with respect to duration of treatment

DOT (weeks)	Pre		Post		Mean Diff.	T	P
	Mean	SD	Mean	SD			
1-4 weeks	6.00	1.63	2.75	2.22	3.25	6.46	< 0.001
5-8 weeks	7.62	1.45	1.92	1.66	5.70	14.16	< 0.001
9-12 weeks	7.92	1.19	1.85	0.90	6.07	22.28	< 0.001

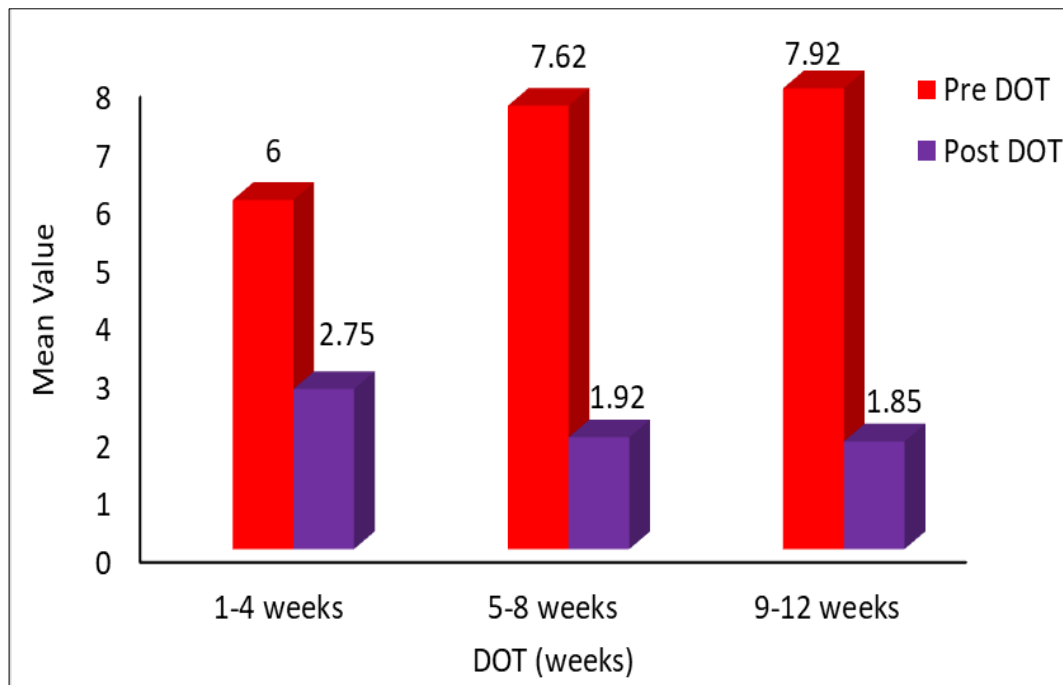


Fig 2: Pre and post vas with duration of treatment

Conclusions

Back pain is a prevalent issue among primigravida females, especially during the third trimester, due to physiological and biomechanical changes. This study demonstrated that specific exercises, such as those involving a Swiss ball, significantly reduce back pain intensity. The exercise

program proved beneficial, with longer treatment durations yielding better outcomes. These findings emphasize the importance of exercise in managing back pain during pregnancy, offering a safe and effective alternative to pharmacological interventions. As a result, pregnant women

are encouraged to engage in supervised exercise routines to alleviate discomfort and enhance overall well-being.

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