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Original Article

A COMPARATIVE STUDY TO ANALYSE THE EFFECT OF EXERCISE VS STANDARD ANTENATAL CARE IN BACK PAIN DURING THE THIRD TRIMESTER IN PRIMIGRAVIDA FEMALES

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ABSTRACT

Objective: This study aims to compare the effect of exercises vs standard antenatal care in back pain during the third trimester in primigravida females.

Methods: The study comprises 60 primigravida females fulfilling the inclusion criteria. The sample was randomly divided into two groups, group A received a specialized exercise program under supervision, and group B received standard antenatal care. The pre-post VAS and Modified ODI were reported for comparison in both groups. Data were analyzed using mean, standard deviation, and t-test.

Results: The results showed that group a over-performed group B.

Conclusion: The study concluded that a specialized exercise program is far better than standard antenatal care in reducing back pain intensity during the third trimester in primigravida females. A supervised exercise program must be included during pregnancy to minimize discomfort and improve the overall functional quality of life.

Keywords: Back pain, Third trimester, Primigravida females, Exercises, Standard antenatal care

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INTRODUCTION

Back pain is the pain in lumbosacral region, which is the most common complaint during third trimester in primigravida females [1]. According to studies, 50-70 % of primigravida females experience back pain during this period. The prevalence of back pain during the first trimester was 16.7%, the second trimester was 31.3%, and third trimester was 53% [2].

The factors that contribute to back pain are weight gain, postural changes, hormonal changes, muscle imbalances, stress, and fatigue. The back pain tends to increase as the gestational age increases due to the biomechanical changes that occur to accommodate the growing foetus [3]. Growing foetus continuously creates pressure on internal structures and neurovascular bundle to accommodate these changes, undue shortening and lengthening of soft tissue occurs [4]. Abdominal muscles elongate, stretch, and become weak, whereas back muscles become short and tight, resulting in reduced natural mobility of the pelvis, making it difficult for the baby to accommodate in the pelvis, which contributes to complaints of back pain during the third trimester [5, 6].

The population of primigravida females is more prone to pain as they are going through the changes of pregnancy for the first time. Sedentary lifestyle, anxiety, and stress in working women make the situation more complicated [7]. As the pregnancy progresses, the center of gravity shifts more anteriorly, which results in increased lordotic curvature, creating more pressure on the back [8, 9].

Due to the limitations and potential risk, pharmacological interventions are discouraged during pregnancy and also as the pain is due to mechanical changes of pregnancy, which cannot be relived permanently through chemical formulations. To break this limitation, various measures are taken to relieve pain during pregnancy, such as hot fermentation, exercises, massage, yoga, etc. [10, 11].

Most studies focused the prevalence of back pain being highest in the third trimester; however, only a few focus on some of the exercises and their effect [12]. This study particularly focuses on the comparison of standard antenatal care vs a specific exercise program in reducing the intensity of back pain during third trimester in primigravida females. Comparison between traditional treatment and specific exercise protocol will provide new insights into the treatment of back pain during pregnancy.

Standard antenatal care includes hot fermentation and maintaining normal physical fitness as advised by their health care provider without any additional exercises. Specific exercise program consist of stretching, strengthening, and mobility exercises to strengthen the muscles of back, improve the mobility of the pelvis, and alleviate back pain [13, 14].

Pregnancy is a life-changing experience for every female, so this study provides evidence-based information for healthcare providers to improve the quality of life during pregnancy.

MATERIALS AND METHODS

Study subjects

The study subjects were composed of 60 primigravida females.

The inclusion and exclusion criteria were as follows:

Inclusion criteria

- Primigravida females of age group 21-35 y, with a gestation period of 26-36 w.
- Females with self-reported back pain during the third trimester of pregnancy.
- Participants who can 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 the incompetent cervix, preeclampsia, persistent second-trimester bleeding, placental abruption, foetal distress, placenta previa, threatened pre-term labor, abnormal foetal presentation, recurrent miscarriage, intrauterine growth retardation, dilated cervix.

Study design

A comparative study to compare the effect of exercises vs standard antenatal care

Study setting

Pacific medical college and hospital, Udaipur.

Ethical clearance

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

Method

Each subject was interviewed for demographic data, age, weight, and lifestyle.

The informed consent was obtained from all the subjects. The objective and procedure of the study were explained.

The study subjects are randomly divided into two groups

Group A (N = 30) EXERCISE GROUP performed a specialized exercise program designed for the treatment of back pain during the third trimester

Group B (N = 30) CONTROL GROUP followed the standard antenatal care without any additional intervention for the treatment of back pain during the third trimester.

Pre-treatment VAS and ODI were recorded to assess the intensity of pain and functional disability.

Intervention

Group A consisted of 30 subjects who performed supervised exercise sessions 3 times a week for 45 min per session, followed by 5-10 min of warm-up and cool-down. The exercise included diaphragmatic breathing, seated pelvic circles, side-to-side rocking, pelvic tilts on ball, seated groin stretch, and modified squats. The group B consisted of 30 subjects who were treated with standard antenatal care without any additional exercises. They were advised to maintain their regular physical activity levels and followed recommendations provided by their health care provider for managing back pain.

Post-treatment VAS and ODI were recorded for pre and post-treatment comparison.

Statistical analysis

The shift in score between pre and post-treatment in VAS and ODI of two groups and continuous demographic variables (Age, weight, duration of treatment, lifestyle) of the two groups was evaluated by comparing using an independent t-test. The mean difference SD was used to represent the whole data. The t-test was performed to analyze the group's pre and post-differences. For a two-tailed (alpha-2) probability (p) value, P<0.05 was ^deemed statistically significant. Data is also calculated individually in both groups. For comparison of VAS and ODI within different age groups and for different duration of treatment.

RESULTS

The study population

The age range of subjects in this study was 21-25 y of age 13.33% and 20% individuals in the exercise group and control group, respectively. There are 60% individuals of 26-30 y of age in both groups. 31-35 y 26.67% and 20% individuals in exercise, control group respectively.

Table 1: Distribution in the Age group

Age (y)	Exercise group		Control group	
	N	%	N	%
21-25	4	13.33%	6	20.00%
26-30	18	60.00%	18	60.00%
31-35	8	26.67%	6	20.00%
Total	30	100.00%	30	100.00%

P=0.7 (NS)

Table 2: Distribution of weight in groups

	Exercise group		Control group	
	Mean	SD	Mean	SD
Weight	65.97	7.25	65.47	8.78

Table 3: Distribution of DOT in weeks between groups

Time (w)	Exercise group		Control group	
DOT (w)	N	%	N	%
1-4 w	4	13.33%	2	6.67%
5-8 w	13	43.33%	15	50.00%
9-12 w	13	43.33%	13	43.33%
Total	30	100.00%	30	100.00%

Table 4: Comparison of VAS in exercise group

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 5: Comparison of VAS in control group

VAS	N	Mean	SD	Std. error	Mean diff	T	P	Sig.
Pre-test	30	7.30	1.49	0.27	2.03	6.55	<0.001	HS
Post-test	30	5.27	1.70	0.31				

Table 6: Comparison of ODI in exercise group

ODI	N	Mean	SD	Std. error	Mean diff	T	P	Sig.
Pre-test	30	66.53	10.79	1.97	38.40	19.78	<0.001	HS
Post-test	30	28.13	10.63	1.94				

Table 7: Comparison of ODI in control group

ODI	N	Mean	SD	Std. error	Mean **diff**	T	P	Sig.
Pre-test	30	69.80	9.98	1.82	11.80	3.92	<0.001	HS
Post-test	30	58.00	16.47	3.01				

Both groups demonstrate changes in VAS and ODI. However, group A showed a significant improvement where the Pre-treatment mean VAS was 7.53 with SD of 1.46±0.27 whereas post-treatment mean VAS was 2.00 with SD OF 1.44±0.26, Pre-treatment mean ODI score was 66.53 with SD of 10.79 ±1.97 and Post-treatment mean ODI score is 28.13 with SD of 10.63±1.94. Group B (control group) showed a Pre-treatment mean VAS is 7.30 with SD of 1.49 ±0.27 whereas a post-treatment mean VAS is 5.27 with SD of 1.70 ±0.31, Pre-treatment mean ODI score is 69.80 with SD of 9.98 ±1.82, Post-treatment mean ODI score is 58.00 with SD of 16.47 ±3.01.

DISCUSSION

According to Martins *et al.*, back pain is the pain located in the lumber and sacroiliac region. Back pain during Third trimester is the most prevailing musculoskeletal discomfort as the size of the uterus continuously increases with the gestational age. Maryam Rabiee and Niloofar Sarchamie (2018) concluded that back pain during pregnancy is common and causes moderate to severe disability in the majority of pregnant women [1].

During third trimester to adjust the growing foetus various biomechanical changes occur in the body. Lumbar lordosis and spinal curvature increase to maintain the COG of the body, and the knees go into hyperextension, which creates pressure on the muscles of the back and results in back pain (Arummega, Rahmawati, and Meiranny, 2022) [16].

According to Buhling, Age is another factor that affects the intensity of back pain in primigravida females. In the present study also, subjects aged 21-25 y reflect a better prognosis in intensity of back pain than subjects aged 31-35 y. In the recent era, the age of females during their first pregnancy is continuously increasing, which makes the body incompatible to go through the physiological changes of pregnancy, resulting in increased pain and disabilities during pregnancy [4].

The study by Garshabi *et al.* indicated that exercise has established effects in reducing back pain during pregnancy. A review study done by Hassanabadia and colleagues showed that the impact of exercises on back pain during pregnancy was not so determined because of diffuse patterns and designs of studies [8].

Siti Mutoharoh, Dyah Puji Astuti et, al (2023) showed that regular exercises balance the muscles and release endorphin, which acts as a natural sedative, creating a sense of comfort and thus reducing back pain. Another study revealed that pelvic tilt changes the angle of lumber lordosis, this exercise was designed to strengthen or increase the flexibility of the muscle needed to compensate for increased abdomen and thereby maintaining normal posture [15]. Pelvic tilts on the Swiss ball would be more appropriate during the third trimester. Breathing exercise is also included in the exercise program to facilitate relaxation of the pelvic floor, easing off the stress from the body [9]. Irawati, susanti, and haryono, 2019 in a study, mentioned that pregnancy exercises on a Swiss ball stimulate the postural reflexes and strengthen the muscles of back, which ultimately helps in reducing the intensity of back pain [14].

The findings of the study were consistent with previous studies that pregnancy exercise 3-5 times a week reduces the risk of back pain. Exercises help to enhance flexibility, strength, and endurance. The exercises prepare the primigravida females both physically and mentally to cope with pain during third trimester [12].

The age, weight, and duration of treatment were not significantly different in both groups. The data suggests that specific exercise protocol during third trimester for the primigravida population helps in reducing the intensity of back pain better than standard antenatal care. Supervised training is important to avoid any excess stretch or injury during the session.

CONCLUSION

The study concluded that both the groups showed changes in outcomes, but group A with a specialized exercise program is more effective than standard antenatal care in reducing back pain and disability among third-trimester primigravida females. From this study, it is very clear that if expert supervision is taken, then prolonged and dipper relief can be provided to the patient. Therefore, a multidisciplinary approach is needed for an hour with increasing antenatal complications.

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AUTHORS CONTRIBUTIONS

All the authors have contributed equally

CONFLICTS OF INTERESTS

Declared none

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