FREQUENCY OF ANTERO POSTERIOR PELVIC TILT IN POSTPARTUM PATIENT OF CHRONIC LOW BACK PAIN

Hiba Saif[1]

[1]Rehab Care (Physiotherapy Rehabilitation Center & School for Special Children)

HIGHLIGHTS

- A cross-sectional study was conducted to find the frequency of anteroposterior pelvic tilt in postpartum patients with chronic low back pain.
- Oswestry low back pain disability questionnaire, Numeric Pain Rating Scale, and goniometer were study tools for data collection of 190 postpartum females with chronic low back pain.
- Anterior pelvic tilt was more common than posterior pelvic tilt among postpartum patients with chronic low back pain.

ABSTRACT

Background: In postpartum patients with low back aches, postural changes have been visible to keep them away from pain. In case of continual low back ache, those modifications adaptively might also adjust muscles strength and body mechanics, which lead to adaptations in the role of pelvic anterior superior and posterior superior iliac spines. It may cause an exaggerated or decreased attitude of pelvic inclination. However, the frequency of this phenomenon is not acknowledged. **Material and Methods**: A cross-sectional survey was conducted to collect data using the Oswestry low back pain disability questionnaire, Numeric Pain Rating Scale, and goniometer from a conveniently selected sample of 190 postpartum females with low back pain visiting Sir Gangaram Hospital, LGH, and Mayo Hospital in Lahore. After collection, data were entered and analyzed using SPSS version 21. **Results:** Mean age of participants was 31.29±5.4, with a mean BMI of 24.29±3.4. On average, the pain score was 3.98 ±3.1. About 41.1% had anterior pelvic tilt, 25.8% had posterior pelvic tilt, and 33.2% were neutral. The angle of inclination had a mean of 29.68 ±10.23 degrees. **Conclusion:** Pelvic tilt was frequent (41.1%) in postpartum patients with chronic lower backache. There was a substantial correlation between pain and pelvic tilt for the postpartum low back pain patient.
Keywords: Anteroposterior tilting, Low back pain, Pelvic inclination, Postpartum, Pelvic tilt

INTRODUCTION

Low back pain (LBP) is not a disorder, and it is not a diagnostic category.[1] The cause of LBP is multi-factorial. There are three crucial factors for the chronicity of LBP: 1. history of LBP with related confinements and covers, 2. discontentedness at work, and 3. poor general therapeutic situation. [2] Low back pain or distress is classed by length as intense if torment lasts;6 weeks, sub-constant if torment is going on for 6-12 weeks, or endless if torment is going on for very twelve weeks.[1] Due to hormonal changes associated with pregnancy and physiological stressors including pregnancy related abdominal swelling, the pelvic joints change during pregnancy and child-birth.[3] The forward pelvic tilt is a postural malformation brought on by prolonged sitting, which tightens the hip flexors and drags the pelvis downward, putting strain and pain on the body. Foremost support tilt is caused by expanded body part spinal curve, body part hunchback, extended

abdominal muscles, and fixed hip flexors. The regular support plot for the anterior superior iliac spine than back prevalent bone spine 0-23 degrees with a mean of thirteen and fluctuation of 5°.[1,4-7] An anterior girdle tilt is usually caused by the spasm in muscles around the lumbar and pelvic areas.[1,6] Posterior tilting of the pelvis moreover includes compression of the abdominal muscles. It has, in this way, ordinarily been identified with core strength in the external and internal obliques and rectus abdominis muscles to grant dynamic stability to the spine through their connections to the thoracolumbar facia.[8,9] Pregnancy-related hormones impact the ligaments and bone in the pelvic region and have anti-fibrotic effects, causing the pelvic joints to become looser. A former study discovered that postpartum women's interpubic gaps were broader than those of nulliparous women. As a result, during delivery, the pelvis' frontal plane position shifts.

Various past examination contemplates utilizing the ASIS-PSIS edge to inquire about varieties in support introduction between pregnant individuals and postpartum patients with low back pain. It is indispensable to search out recurrence of the predominance of sagittal plane pelvic tilt in postpartum patients with LBP as an assortment of physical advisors regularly trust that postpartum patient who has LBP even have unreasonable body part low back and overstated anterior pelvic tilt. In postpartum patients with low back pain, recently, the focus has been placed on the native systems for dominant segmental spinal stability, not on the worldwide spinal muscles.[10] Some researchers have shown no essential changes in pelvic tilt, thoracic, and lumber curvature throughout maternity. Low back pain because of postural changes is the second most vital neurological disease seen in 50-90% of pregnant ladies in the USA. Those ladies, United Nations agency have back pain throughout maternity, additionally expertise postpartum low back pain.[14]

There have been many studies about the pelvic alignment of women during pregnancy and delivery, never-pregnant women, and females with chronic low back pain. However, there are few studies about the pelvic alignment of postpartum women. Therefore, the purpose of this study was to find the frequency of pelvic tilt in postpartum women with low back pain in a cross-sectional observational study.

METHODOLOGY

It was a cross-sectional study that conveniently assembled 190 postpartum patients with chronic LBP aged between 20 and 40.[11] This study excluded ladies with any diagnosed spine pathology, history of low back pain before pregnancy, arthritic conditions, or any systematic illnesses. The authors calculated the sample size of 165 through the single proportion method by Epitool software [12] with the following formula.

$$n = \frac{Z^2_{1-\alpha/2} P(1-P)}{d^2}$$

Where: Z= 1.96
d= 0.07
P= 0.30[13]
CI=95%
Written consent was taken from the respective hospitals and the patients before proceeding with any medical procedures. For data collection, the Oswestry low back pain disability Questionnaire[14] for functional disability related to postpartum low back pain, the Numeric Pain Rating Scale[15] for low back pain, and the Pelvic Inclinometer[16] for the attitude of pelvic inclination were used. This patient stood on a flat surface with their feet

and arms at shoulder height and their palms facing forward. The authors placed one arm of the instrument on the anterior superior iliac spine (ASIS) and the second on the posterior superior posterior spine (PSIS) of the same face. The attitude demonstrated on the goniometer could be said as the anterior/posterior pelvic inclination perspective.[17,18]

RESULTS

Out of 190 participants, all were postpartum females. The mean age of participants was 31.29±5.4, with a mean BMI of 24.29±3.4. On Average mean pain, the score was 3.98 ±3.1. 41.1% had anterior pelvic tilt, 25.8% had posterior pelvic tilt, and 33.2% were neutral. The angle of inclination has a mean of 29.68 ±10.23. (Table I)

Table I: Descriptive Statistics of BMI, NPSR, Age, Angle of Inclination of participants

Variables	Minimum	Maximum	Mean	SD
BMIN	15.5	33.7	24.296	3.376
umeric Pain Rating Scale	0	10	3.98	33.05
Age	25	40	31.29	25.350
Angle of Inclination of pelvis	10.00	50.00	29.684	10.239

Out of 190, 34 participants were those who had no pain, 55 were with mild pain, 73 were with moderate pain, and 28 were with severe pain. Out of 190 participants, 42 rapidly improved, 43 responded that their pain fluctuates but overall is getting better, and 44 responded that their pain seems to be getting better, but improvement is slow. Forty-three responded that their pain is neither getting better nor worse, 4 participants responded that their pain is gradually worsening, and 5 participants responded that their pain is rapidly worsening. (Table II)

Table II: Frequency (%) of Changing Degree of Pain

Variables	Frequency	Percentage
My pain is rapidly getting better.	42	22.1%
My pain fluctuates but overall is definitely getting better.	43	22.6%
My pain seems to be getting better but improvement is slow at the present.	44	23.2%
My pain is neither getting better nor worse.	4	22.6%
My pain is gradually worsening.	34	2.1%
My pain is rapidly worsening.	14	7.4%

Results portrayed that out of 190 participants, 41.1% had anterior pelvic tilt, 25.8% had posterior pelvic tilt, and 33.2% were neutral. (Table III)

Table III: Type of pelvic tilt

Pelvic Tilt	Frequency	Percentage
Anterior Tilt	78	41.1%
Neutral	63	33.2%
Posterior Tilt	49	25.8%

DISCUSSION

This study aimed to search for the frequency of pelvic shifting in the sagittal plane in postpartum women with low back pain. For this purpose, 190 participants were selected from Sir Gangaram Hospital, Lahore General Hospital, Mayo Hospital, and Oswestry low back pain disability Questionnaire was handed over to the postpartum patients, and they were asked to fill it honestly about their experiences regarding their satisfaction. The result of this study exhibited that there was an increase in anterior pelvic tilt in a postpartum patient with low back pain. A goniometer measured it. In this study, postpartum low back pain patients had more anterior pelvic tilt. Pregnant women's pelvises have a broader anterior breadth and narrow posterior width. Essential varia-

bles affecting the pelvis's anterior and posterior breadth include pregnancy and childbirth. Postpartum women's anterior and posterior widths did not significantly differ from those of pregnant women. According to A Stolarczyk et al., the pubic symphysis and sacroiliac joints were observed to separate during delivery, and postpartum women had more significant interpubic gaps than nulliparous women. [19]

In contrast to this study, which examined postpartum women 1 to 6 months after delivery, the participants in the earlier study were 2 to 12 days postpartum. 4 and 12 weeks after giving birth, the sacroiliac joints and symphysis pubis return to normal. As a result, postpartum women's pelvic width could increase soon after childbirth. Morino S presented that the asymmetry of the pelvis was significant in postpartum pregnant women. Women who recently gave birth may experience pelvic asymmetry and stiffness.[20]

Youdas JW depicted that ASIS-PSIS angle of investigation is applied in much past research to differentiate pelvic orientation in postpartum patients affected with low back pain and healthy individuals. [21] Present study also shows that anterior shifting of the pelvis is more common in postpartum females with low back pain because most participants have the anterior shifting of the pelvis. Demir-Deviren, Sibel, et al. [22] found that 32% of the chronic low back pain postpartum patients had sagittal plain spinopelvic misalignment; however, in this study ratio of malalignment was 67%. This study directed the association between postpartum females and the angle of inclination. The cause for this can be the wide pelvic cavity to hold the baby during pregnancy. The study also linked that postpartum females have more anterior shifting than posterior.

Research disclosed that some of the relevant factors linked with degeneration of back muscles are Spinopelvic parameters. That is why many studies are essential to order to find clinically significant results of degeneration of the lumbar spine. Pelvic Inclination (PI), a constant anatomical value, is the key to spinopelvic parameters for sagittal balance independent of pelvic positioning. When lumbar lordosis develops, PI increases, but it is not altered after adolescence. Prediction for chronic lower back pain, PI plays an important role. Chaléat-Valayer E says that singular patient information meta-examination and randomized preliminaries should concentrate more on this region to help figure out how to diminish persistent lower back discomfort. [2]

This study has some limitations, it didn't consider other things like radiculopathy, post fractures, and traumatic cases. Additionally, factors leading to changes in a pelvic tilt were not assessed Muscle strength was not measured A study using more advanced digital instruments to measure the angle of pelvic inclination should be done. The study used a small sample size as it should have used a larger one. The most significant barriers include other factors, including the patient's willingness to be interested in the program. We did not observe factors leading to changes in a pelvic tilt. Muscle strength was not measured. The time was limited.

CONCLUSION

Changes in the angle of pelvic inclination are common in low back pain-affected postpartum patients. There was a significant correlation between pain and anterior pelvic tilt for the postpartum low back pain patients. The anterior pelvic tilt is more common than the posterior pelvic tilt, demonstrating a high frequency of increased lumbar lordosis in low

back pain affected postpartum patients, which occurs due to increased anterior pelvic tilt angle.

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