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Prevalence of Sacroiliac Joint Dysfunction in Postpartum Women

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ABSTRACT

Background: Pregnancy related biomechanical and hormonal changes predispose women to sacroiliac joint (SIJ) dysfunction, a significant contributor to postpartum low back and pelvic girdle pain.

Objective: To determine the prevalence of sacroiliac joint dysfunction among postpartum women in tertiary care hospitals in Lahore.

Methods: A cross-sectional study was conducted on 202 postpartum women (18–45 years) within 3–7 days after delivery. Data were collected using a structured questionnaire and Visual Analog Scale. SIJ dysfunction was assessed using five provocation tests (P4, FABER, March, Gaenslen's, Compression), with diagnosis confirmed when ≥3 tests were positive. Descriptive analysis was performed using SPSS-25.

Results: The prevalence of SIJ dysfunction was 51.2%. Low back pain was reported before (44.1%), during (75.7%), and after pregnancy (77.7%). The most positive tests were FABER (59.9%), Gaenslen's (56.9%), and March test (52.5%), while Compression test (34.2%) was least positive. Pain was predominantly dull (55.9%), with gradual onset (53.5%), and radiating pain in 35.1%. Cesarean delivery accounted for 76.2% of cases.

Conclusion: Increased SIJ dysfunction is highly prevalent in early postpartum women, emphasizing the need for routine screening and early physiotherapy interventions to prevent chronic disability.

Keywords: Cesarean Section, Low Back Pain, Pelvic Girdle Pain, Postpartum Period, Pregnancy, Prevalence, Sacroiliac Joint Dysfunction, Visual Analog Scale.

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Introduction

Pregnancy induces profound physiological, hormonal, and biomechanical adaptations that are essential for fetal development and parturition, yet these changes substantially affect the lumbopelvic region and may predispose women to musculoskeletal dysfunction (1). Among these conditions, sacroiliac joint (SIJ) dysfunction has emerged as a clinically significant contributor to low back and pelvic girdle pain during both pregnancy and the postpartum period (2). Hormonal influences, particularly increased secretion of relaxin and progesterone, promote ligamentous laxity to facilitate pelvic expansion; however, this adaptive hypermobility may compromise joint stability, especially at the sacroiliac articulation, resulting in abnormal motion, altered load transfer, and pain generation (3,4). Concurrently, progressive anterior displacement of the center of gravity, increased lumbar lordosis, and compensatory pelvic tilt amplify mechanical stress across the sacroiliac joints, thereby increasing susceptibility to dysfunction (5). Additional factors such as gestational weight gain, altered gait biomechanics, and increased shear and compressive forces further burden the pelvic girdle complex (6).

The sacroiliac joint serves as a critical load-transferring structure between the axial skeleton and lower extremities, functioning through a complex interplay of anatomical congruency and neuromuscular stabilization (7). Its stability depends on both passive ligamentous integrity and active muscular support from structures including the gluteus maximus, piriformis, quadratus lumborum, and erector spinae (8). The concept of "form and force closure" describes this biomechanical equilibrium, whereby structural alignment and muscular tension collectively ensure optimal joint stability and efficient force transmission (9). Disruption of either mechanism—whether due to hormonal ligament laxity, repetitive mechanical strain, or trauma during childbirth can precipitate sacroiliac joint dysfunction. Clinically, SIJ pain is typically localized to the posterior pelvis and buttock, occasionally radiating to the posterior thigh without extending below the knee, and is often exacerbated by prolonged standing, sitting, or transitional movements (10). Diagnostic differentiation remains challenging because symptoms frequently mimic nonspecific low back pain or lumbosacral radiculopathy; therefore, clusters of validated provocation tests such as FABER, thigh thrust (P4), Gaenslen's, compression, and sacral thrust tests are recommended to enhance diagnostic accuracy (11,12).

The postpartum period is characterized by persistent ligamentous laxity, residual muscular weakness, and incomplete restoration of pre-pregnancy biomechanics, all of which may prolong or exacerbate sacroiliac instability (13). Epidemiological data indicate that the prevalence of SIJ-related pain among postpartum women ranges widely from 26% to 66%, influenced by parity, occupational demands, physical activity levels, and mode of delivery (14,15). Persistent sacroiliac pain may significantly impair maternal functional capacity, limit childcare activities, disrupt sleep, and negatively affect overall quality of life (16). Despite its frequency, SIJ dysfunction is often under-recognized or misclassified as generalized low back pain, leading to delayed intervention. Distinguishing mechanical SIJ dysfunction from inflammatory sacroiliitis is essential, as management strategies differ considerably (10). Early physiotherapeutic assessment and targeted stabilization programs focusing on core musculature and pelvic alignment have demonstrated potential in reducing symptom chronicity and improving functional outcomes (2,12,14).

Although pregnancy-related pelvic girdle pain has been extensively investigated, fewer studies have specifically quantified the prevalence of sacroiliac joint dysfunction during the immediate postpartum phase, particularly in South Asian populations. Moreover, limited data exist regarding the influence of cesarean versus vaginal delivery on the persistence or onset of SIJ dysfunction after childbirth. Given the substantial biomechanical stress associated with pregnancy and delivery, combined with potential socioeconomic and functional implications, systematic evaluation of postpartum women is warranted. Therefore, this study was designed to determine the prevalence of sacroiliac joint dysfunction among postpartum women in tertiary care hospitals in Lahore, with the aim of contributing epidemiological evidence to guide early screening, targeted rehabilitation, and preventive strategies in this vulnerable population.

Materials and Methods

This cross-sectional study was conducted to determine the prevalence of sacroiliac joint (SIJ) dysfunction among postpartum women. The study was carried out at Gulab Devi Educational Complex and Lady Wallington Hospital, Lahore, Pakistan, over a six-month period from July 2025 to December 2025. The target population comprised postpartum women presenting to the obstetrics and gynecology units of the selected tertiary care hospitals during the early puerperal period.

The sample size was calculated using the Cochran formula ($n_0 = Z^2pq/e^2$), assuming a previously reported prevalence of 66.7%, a 95% confidence level (Z = 1.96), and a margin of error of 6.5% (17). Based on these parameters, the required sample size was estimated to be 202 participants. A non-probability convenience sampling technique was employed to recruit eligible participants based on accessibility and willingness to participate (18). Women aged between 18 and 45 years who were between the third and seventh postpartum day, had delivered either by normal vaginal delivery or cesarean section, and reported low back or pelvic girdle pain were included in the study. Participants were excluded if they had inflammatory or

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infectious joint disease, metabolic bone disorders, pelvic fractures, trauma, rheumatoid arthritis, ankylosing spondylitis, nerve root compression, prior spinal or pelvic surgery for chronic low back pain, or serious postpartum complications such as internal hemorrhage, in order to avoid confounding factors affecting pain assessment (19).

Data collection was carried out after obtaining written informed consent from all participants. Confidentiality and anonymity were strictly maintained throughout the research process. The study protocol adhered to the ethical principles and ethical approval was obtained from the institutional review board of the respective institutions prior to commencement of data collection. Participation was entirely voluntary, and participants were informed of their right to withdraw at any stage without any consequences to their medical care.

Demographic and clinical data were collected using a structured, self-administered questionnaire that included variables such as age, body mass index, occupation, parity, and mode of delivery. Information regarding history of low back pain before, during, and after pregnancy was also documented. Pain intensity was assessed using the Visual Analog Scale (VAS), a validated and widely accepted tool for measuring subjective pain intensity.

A standardized physical examination was performed by trained physiotherapists to assess sacroiliac joint dysfunction. Five validated provocation tests were administered: the P4 (posterior pelvic pain provocation or thigh thrust) test, FABER (Flexion, Abduction, and External Rotation) test, March test, Gaenslen's test, and the Compression test. These tests have demonstrated acceptable reliability and diagnostic validity in identifying SIJ dysfunction, particularly when used in combination (12). The P4 test was performed with the participant in a supine position and the hip flexed to 90 degrees while applying posterior shear force through the femur. The FABER test involved positioning the hip in flexion, abduction, and external rotation to reproduce pain. The March test assessed pelvic motion during single-leg stance with contralateral hip flexion. Gaenslen's test was conducted by flexing one hip while extending the contralateral hip to stress the sacroiliac joint. The Compression test was performed in side-lying by applying downward pressure on the iliac crest to provoke symptoms. A diagnosis of SIJ dysfunction was considered when three or more of the five provocation tests were positive, in accordance with established diagnostic recommendations (12).

All assessments were conducted in private examination rooms within the hospital premises to ensure participant comfort and privacy. Standardized procedures were followed to minimize inter-examiner variability, and all examiners received prior training and supervision. The collected data were coded and entered into the Statistical Package for the Social Sciences (SPSS) version 25 for analysis. Descriptive statistics were computed to summarize demographic and clinical characteristics, including means and standard deviations for continuous variables and frequencies and percentages for categorical variables. The prevalence of sacroiliac joint dysfunction was calculated as the proportion of participants meeting the diagnostic criteria.

Results

A total of 202 patients were included in the study. The majority of participants were aged 26–35 years (57.5%), followed by 21–25 years (35.2%), indicating that most women were within the typical reproductive age group. Only a small proportion belonged to the 18–20 years (5.5%) and 36–45 years (2.0%) categories.

Table 1: Demographic Characteristics of Participants (n = 202)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–20	11	5.5
	21–25	71	35.2
	26–35	116	57.5
	36–45	4	2.0
Body Mass Index (kg/m²)	Mean ± SD	23.95 ± 2.83	
Occupation	Housewife	180	89.1
	Working Woman	22	10.9
Mode of Delivery	Normal Vaginal Delivery	48	23.8
	Cesarean Section	154	76.2
Parity	1 Child	46	22.8
	2 Children	53	26.2
	3 Children	47	23.3
	≥4 Children	56	27.7

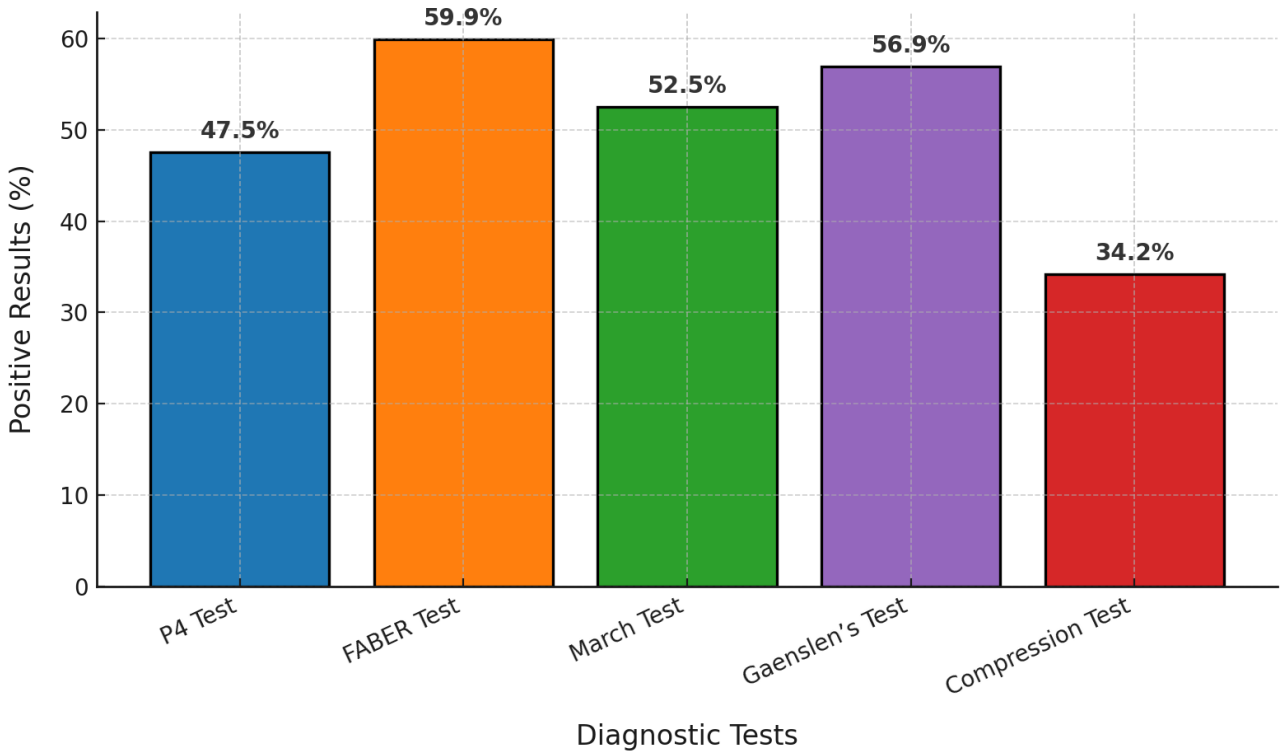

Figure 1: Diagnostic Test Results for Sacroiliac Joint Dysfunction Provocation

The mean body mass index (BMI) of participants was 23.95 ± 2.83 kg/m², which falls within the normal weight range, suggesting that most participants had a relatively healthy body composition. A large proportion of participants were housewives (89.1%), with only 10.9% being employed, reflecting limited occupational diversity in the sample. Regarding delivery mode, cesarean section was highly prevalent (76.2%), compared to normal vaginal delivery (23.8%), indicating a strong inclination toward surgical births in the study population.

The diagnostic test outcomes demonstrated variability in the detection of sacroiliac joint dysfunction among participants. Overall, the findings suggest that provocation tests such as FABER and Gaenslen's are more frequently positive, supporting their clinical utility in identifying sacroiliac joint dysfunction. The lower positivity of the compression test may indicate limited sensitivity when used in isolation, emphasizing the importance of using a cluster of tests rather than relying on a single diagnostic maneuver.

Table 2: Distribution of Pain-Related Characteristics (n = 202)

Parameter	Category	Frequency (n)	Percentage (%)
Low Back Pain Before Pregnancy	Yes	89	44.1
	No	113	55.9
Low Back Pain During Pregnancy	Yes	153	75.7
	No	49	24.3
Low Back Pain After Delivery	Yes	157	77.7
	No	45	22.3
Onset of Pain	Sudden	94	46.5
	Gradual	108	53.5
Nature of Pain	Dull	113	55.9
	Sharp	58	28.7
	Stabbing	31	15.4
Radiating Pain	Yes	71	35.1
	No	131	64.9

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Discussion

In this cross-sectional study, the prevalence of sacroiliac joint dysfunction (SIJD) was studied among postpartum women who were admitted in Gulab Devi Educational Complex and Lady Willingdon Hospital in Lahore. There were 202 participants aged between 18–45 years, evaluated between the third and seventh postpartum day. Five out of five validated diagnostic tests P4, FABER, March, Gaenslen's, and Compression tests were applied, and SIJD was confirmed when three or more tests yielded positive findings. The research found 51.2 % prevalence rate, showing that over half of postpartum women had sacroiliac involvement in the first week following childbirth. These results are relevant clinically since postpartum pelvic and back pain continue to remain underdiagnosed despite their effects on mobility, sleep, and quality of life (1, 20).

Physiological and biomechanical changes during pregnancy are mainly responsible for creating joint instability. 20–40 lb weight gain, anterior pelvic tilt, and ligamentous laxity secondary to the hormone relaxin have all been incriminated in augmenting stress on the sacroiliac articulation (21). Ghodke et al. found that 61.8 % of women who were pregnant had low-back pain and 9 % were totally disabled from it (14). The current results support these findings, with high pain frequencies during pre- (44 %), in-pregnancy (75.7 %), and postpregnancy (77.7 %). This increasing pattern draws attention to the cumulative biomechanical load that continues during the postpartum phase.

The current prevalence of 51.2 % lies between earlier estimates of 26–66 % given in similar South Asian groups (13, 15). In a 2019 study conducted by Haq et al., it was observed that 66.4 % of the women were positive on the test of FABER and reported increased SIJ pain in women with cesarean sections versus vaginal deliveries (76 % vs 58 %) (16). Our results are consistent with this, with 76 % of the sample being delivered by cesarean and having increased pain scores, probably as a result of decreased early mobilization and delayed activation of stabilizing musculature after surgery.

FABER test was the most positive (59.9 %), followed by Gaenslen's test (56.9 %) and March test (52.5 %). These results are consistent with earlier reliability studies which indicated these tests as the most sensitive markers of SIJ dysfunction in the postpartum female (12). The less positive result for the Compression test (34.2 %) is possibly due to its higher reliance on examiner skill and patient tolerance.

Demographically, most of the participants were housewives (89 %) and aged 26–35 years factors found in previous reports that recognized repetitive household and childcare activities as causes of mechanical overload (6). Women with multiple pregnancies showed a stronger tendency toward recurrent pain, reinforcing the relationship between parity and SIJ instability.

In comparison, Zahra et al. reported 46.7 % prevalence of SIJD in 167 women in Lahore, whereas Shete et al. noted 26 % in India (22). The higher percentage in our sample could be due to shorter postpartum evaluation time, during which ligamentous laxity is still maximum. Another study by Naveed Anwar et al. from a different region indicated that maximum pain intensity occurred during late pregnancy and continued to decrease after two months after delivery (23). Our results align with this observation, suggesting that early postpartum screening can capture transient but clinically significant dysfunction.

The most common dull, slowly progressive pain (55.9%) is typical of mechanical SIJ dysfunction, not inflammatory sacroiliitis (9). Radiating pain occurred in 35% of women, usually limited to the posterior thigh, which is consistent with the fact that the sacroiliac joint may simulate lumbosacral radiculopathy without actual nerve-root compression (10). The large percentage of moderate pain on the Visual Analog Scale also indicates the subacute, mechanical character of postpartum symptoms.

However, certain limitations were acknowledged. The use of non-probability convenience sampling may have limited generalizability beyond the selected hospital settings (18). The cross-sectional design precluded causal inference and prevented evaluation of symptom progression beyond the immediate postpartum period. Imaging modalities or diagnostic injections were not utilized to confirm SIJ pathology, which could have improved diagnostic precision. Furthermore, psychosocial factors, occupational workload quantification, and long-term functional outcomes were not assessed, potentially limiting comprehensive risk stratification. The predominance of cesarean deliveries in the sample may also have influenced prevalence estimates.

Together, these findings highlight that postpartum SIJ dysfunction is prevalent under-diagnosed and functionally restrictive. Routine screening of women particularly those with cesarean delivery or multiparity must be incorporated into physiotherapy and obstetric follow-up care. Early therapeutic exercises targeting core stability, pelvic orientation, and ergonomics can minimize chronicity and enhance maternal well-being. Future longitudinal studies must analyze pain trajectories past six months and examine hormonal, biomechanical, and psychosocial correlates in diverse cohorts.

Overall, the present findings reinforced that sacroiliac joint dysfunction represented a substantial and under-recognized contributor to postpartum low back pain. Routine screening within early postpartum care settings was suggested to reduce delayed diagnosis, prevent chronic disability, and improve maternal quality of life.

Conclusion

The present study concluded that sacroiliac joint dysfunction was highly prevalent among postpartum women, affecting 51.2% of participants within the first week after delivery, thereby highlighting its substantial contribution to postpartum low back and pelvic girdle pain. The higher frequency observed among women who underwent cesarean section and those with multiparity underscored the influence of biomechanical stress and delivery-related factors on sacroiliac stability. These findings emphasized the need for routine postpartum screening using validated provocation test clusters to facilitate early diagnosis and targeted rehabilitation.

Authors' Contributions

ICMJE authorship criteria	Detailed contributions	Authors
Substantial Contributions	Conception or Design of the work	1,2,3,5
	Data acquisition	2,3,4,6
	Data analysis or interpretation	1,3,5
Drafting or Reviewing	Draft the work	1
	Review critically	1,2,3,6
Final approval	Final approval of the version to be published.	1,2,3,4,5,6
Accountable	Agreement to be accountable for all aspects of the work.	1,2,3,4,5,6

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