

Research Article

# Association of Cesarean Study with Chronic Low Back Ache in Multiparous Women - A Hospital Based Study

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## ABSTRACT

**Background:** Chronic low back ache is a common musculoskeletal complaint among women after childbirth and can significantly impair quality of life. The increasing rate of cesarean section has raised concerns regarding its long-term effects on maternal musculoskeletal health. This study aimed to evaluate the association between previous cesarean section and chronic low back ache in multiparous women.

**Methods:** A hospital-based observational study was conducted at the Department of Obstetrics and Gynaecology, Kodagu Institute of Medical Sciences, Madikeri, Karnataka, from April 2024 to March 2025. A total of 200 multiparous women were included, comprising 100 women with a history of one or more cesarean sections and 100 women with previous vaginal deliveries. Demographic details, obstetric history, prevalence and severity of chronic low back ache, functional disability, and associated risk factors were assessed using a structured questionnaire, clinical examination, the Visual Analog Scale (VAS), and the Oswestry Disability Index (ODI). Statistical analysis was performed using IBM SPSS Statistics version 25.0, with  $p < 0.05$  considered statistically significant.

**Results:** The baseline demographic and obstetric characteristics were comparable between the two groups. Chronic low back ache was significantly more prevalent among women with previous cesarean section than those with vaginal delivery (61.0% vs. 39.0%,  $p = 0.002$ ). Women in the cesarean group had significantly higher pain severity and greater functional disability scores. Obesity (BMI  $\geq 30$  kg/m<sup>2</sup>) and multiple cesarean sections were significantly associated with chronic low back ache. Women with previous cesarean section had 2.45 times higher odds of developing chronic low back ache compared with women who had only vaginal deliveries.

**Conclusion:** Previous cesarean section is significantly associated with chronic low back ache in multiparous women. Early identification of at-risk women, along with postpartum physiotherapy, core strengthening exercises, and weight management, may help reduce long-term musculoskeletal morbidity and improve maternal quality of life.

**Keywords:** Cesarean Section, Chronic Low Back Ache, Multiparous Women, Visual Analog Scale, Oswestry Disability Index, Postpartum Pain.

## INTRODUCTION

Low back pain (LBP) is one of the most common musculoskeletal disorders affecting women worldwide and is a major cause of disability and reduced quality of life. It is estimated that nearly 60–80% of adults experience low back pain at some point in their lives, with women being disproportionately affected during pregnancy and the postpartum period due to physiological, hormonal, and biomechanical changes (1,2).

Pregnancy induces significant anatomical and functional adaptations, including increased lumbar lordosis, ligamentous laxity mediated by relaxin, weakening of abdominal muscles, weight gain, and altered posture. Although

postpartum recovery occurs in most women, a considerable proportion continue to experience chronic low back pain for months or even years after delivery. Chronic low back ache is generally defined as pain localized between the lower costal margin and gluteal folds persisting for more than 12 weeks (3,4).

Cesarean section (CS) is one of the most frequently performed surgical procedures worldwide, with a continuously rising incidence. According to the World Health Organization, cesarean section rates have increased substantially over the past two decades, exceeding the recommended level of 10–15% in many countries, including India (5). While cesarean delivery is often lifesaving for both mother and fetus, increasing concern

has arisen regarding its long-term maternal consequences.

Several mechanisms have been proposed to explain the association between cesarean delivery and chronic low back pain. Surgical incision through the abdominal wall may weaken the core musculature, alter fascial integrity, produce scar tissue formation, and impair trunk stability. Additionally, postoperative pain, reduced physical activity, delayed rehabilitation, and altered biomechanics may contribute to persistent lumbar discomfort. However, the exact relationship between cesarean delivery and chronic low back ache remains controversial, with studies reporting conflicting findings (6–8).

Multiparous women may be particularly susceptible to chronic low back pain because repeated pregnancies place cumulative mechanical stress on the lumbar spine and pelvic supporting structures. Other contributing factors include obesity, increasing maternal age, parity, occupational workload, poor posture, and reduced physical activity (9,10).

Assessment of chronic low back pain commonly involves standardized tools such as the Visual Analog Scale (VAS) for pain intensity and the Oswestry Disability Index (ODI) for functional impairment. These validated instruments help quantify pain severity and its impact on daily activities, enabling objective comparison between different patient groups (11).

Although several international studies have explored postpartum low back pain, limited data are available from Indian populations evaluating its association with cesarean section, particularly among multiparous women. Understanding this relationship may help identify women at increased risk and facilitate early preventive interventions such as physiotherapy, core muscle strengthening, weight management, and ergonomic counseling.

Therefore, the present hospital-based study was undertaken to evaluate the association between previous cesarean section and chronic low back ache in multiparous women attending Kodagu Institute of Medical Sciences, Madikeri, and to compare the prevalence, severity, and functional disability associated with low back pain between women with previous cesarean and vaginal deliveries.

## MATERIALS AND METHODS

### Study Design and Setting

This hospital-based observational cross-sectional study was conducted in the Department of Obstetrics and Gynaecology in collaboration with the Department of Orthopaedics and Physical Medicine, Kodagu Institute of Medical Sciences, Madikeri and Karnataka, India. The study was carried out over a period of one year from April 2024 to March 2025. The study aimed to evaluate the association between previous cesarean section and chronic low back ache among multiparous women attending the outpatient departments. Ethical clearance was obtained from the Institutional Ethics Committee before commencement of the study. Written informed consent was obtained from all participants prior to enrolment.

### Study Population

A total of 200 multiparous women attending the Obstetrics and Gynaecology and Orthopaedics outpatient departments during the study period were included.

Participants were divided into two groups:

- **Cases:** 100 multiparous women with a history of one or more cesarean sections.
- **Controls:** 100 multiparous women with a history of only vaginal deliveries.

### Inclusion Criteria

Women fulfilling the following criteria were included:

- Multiparous women aged 25–45 years.
- History of at least two completed pregnancies.
- Delivery occurring at least one year prior to enrolment.
- Women willing to participate and provide informed consent.
- Availability of obstetric records or reliable obstetric history.

### Exclusion Criteria

Women with any of the following were excluded:

- Previous history of chronic low back pain before the first pregnancy.
- History of spinal trauma or vertebral fractures.
- Congenital spinal deformities.
- Lumbar disc prolapse diagnosed before pregnancy.
- Rheumatoid arthritis or ankylosing spondylitis.
- Osteoporosis with vertebral fractures.
- Neurological disorders affecting the spine.
- Previous spinal surgery.
- Current pregnancy.
- Malignancy involving the spine.

- Incomplete clinical records or inability to complete assessment.

#### Sample Size

The study included a total of 200 participants, comprising 100 women with previous cesarean section and 100 women with previous vaginal deliveries, selected by consecutive sampling during the study period.

#### Data Collection

Data were collected using a structured predesigned questionnaire and review of hospital records.

The following information was recorded:

- Age
- Body Mass Index (BMI)
- Occupation
- Educational status
- Parity
- Number of cesarean sections
- Number of vaginal deliveries
- Time since last delivery
- Mode of delivery
- Duration of low back pain
- Pain characteristics
- Radiation of pain
- Aggravating and relieving factors
- Physical activity level
- Smoking history
- Comorbid illnesses
- Analgesic use
- Physiotherapy history

#### Clinical Evaluation

All participants underwent detailed clinical examination including:

- General physical examination
- Body Mass Index assessment
- Lumbar spine examination
- Posture assessment
- Tenderness over lumbar spine
- Range of motion of lumbar spine
- Straight Leg Raising (SLR) test
- Neurological examination of lower limbs
- Assessment for muscle spasm
- Functional disability evaluation

#### Assessment of Low Back Pain

Chronic low back ache was defined as pain localized between the lower rib margin and gluteal folds persisting for more than 12 weeks.

Pain severity was assessed using the Visual Analog Scale (VAS) ranging from 0 to 10.

Pain severity was categorized as:

- Mild (VAS 1–3)
- Moderate (VAS 4–6)
- Severe (VAS 7–10)

Functional disability was evaluated using the Oswestry Disability Index (ODI).

#### Outcome Measures

##### Primary Outcome

- Association between previous cesarean section and chronic low back ache in multiparous women.

##### Secondary Outcomes

- Severity of low back pain (VAS score).
- Functional disability (ODI score).
- Duration of pain.
- Frequency of analgesic use.
- Association of BMI, parity, occupation, and number of cesarean sections with chronic low back pain.

#### Statistical Analysis

Data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics version 25.0.

- Continuous variables were expressed as mean  $\pm$  standard deviation (SD).
- Categorical variables were presented as frequency and percentage.
- Student's independent t-test was used for comparison of continuous variables.
- Chi-square test or Fisher's exact test was used for categorical variables.
- Odds ratio (OR) with 95% confidence interval (CI) was calculated to determine the association between cesarean section and chronic low back ache.
- A p-value  $<0.05$  was considered statistically significant.
- Results were presented in tables and charts wherever appropriate.

#### RESULTS AND OBSERVATIONS

A total of 200 multiparous women were included in this hospital-based study. Among them, 100 women had a history of one or more cesarean sections (Cases) and 100 women had a history of only vaginal deliveries (Controls). The prevalence and severity of chronic low back ache, associated risk factors, and functional disability were compared between the two groups.

Table 1. Baseline Demographic Characteristics

| Variable                      | Cesarean Group (N=100) | Vaginal Delivery Group (N=100) | P-Value |
|-------------------------------|------------------------|--------------------------------|---------|
| Mean Age (Years)              | 33.8 $\pm$ 5.4         | 34.1 $\pm$ 5.7                 | 0.694   |
| Mean BMI (Kg/M <sup>2</sup> ) | 26.8 $\pm$ 3.4         | 26.2 $\pm$ 3.2                 | 0.218   |
| Homemakers                    | 69 (69.0%)             | 72 (72.0%)                     | 0.639   |

|               |            |            |  |
|---------------|------------|------------|--|
| Working Women | 31 (31.0%) | 28 (28.0%) |  |
|---------------|------------|------------|--|

**Observation:** The two groups were comparable with respect to age, BMI, and occupation.

Table 2. Obstetric Characteristics

| Variable          | Cesarean Group (N=100) | Vaginal Delivery Group (N=100) | P-Value |
|-------------------|------------------------|--------------------------------|---------|
| Mean Parity       | 2.5 ± 0.8              | 2.6 ± 0.9                      | 0.441   |
| Two Deliveries    | 58 (58.0%)             | 61 (61.0%)                     |         |
| Three Deliveries  | 30 (30.0%)             | 27 (27.0%)                     |         |
| ≥ Four Deliveries | 12 (12.0%)             | 12 (12.0%)                     | 0.931   |

**Observation:** Obstetric characteristics were similar in both study groups.

Table 3. Prevalence of Chronic Low Back Ache

| Variable                      | Cesarean Group (N=100) | Vaginal Delivery Group (N=100) | P-Value      |
|-------------------------------|------------------------|--------------------------------|--------------|
| Chronic Low Back Ache Present | 61 (61.0%)             | 39 (39.0%)                     | <b>0.002</b> |
| Chronic Low Back Ache Absent  | 39 (39.0%)             | 61 (61.0%)                     |              |

**Observation:** Chronic low back ache was significantly more common among women with previous cesarean section.

Table 4. Duration of Low Back Pain

| Duration    | Cesarean Group (N=61) | Vaginal Delivery Group (N=39) | P-Value |
|-------------|-----------------------|-------------------------------|---------|
| 3–6 Months  | 13 (21.3%)            | 12 (30.8%)                    |         |
| 6–12 Months | 24 (39.3%)            | 15 (38.5%)                    |         |
| >12 Months  | 24 (39.3%)            | 12 (30.8%)                    | 0.487   |

**Observation:** Persistent pain lasting more than one year was more frequently observed in women with previous cesarean section.

Table 5. Severity of Low Back Pain (VAS Score)

| Pain Severity      | Cesarean Group (N=61) | Vaginal Delivery Group (N=39) | P-Value      |
|--------------------|-----------------------|-------------------------------|--------------|
| Mild (Vas 1–3)     | 12 (19.7%)            | 14 (35.9%)                    |              |
| Moderate (Vas 4–6) | 31 (50.8%)            | 18 (46.2%)                    |              |
| Severe (Vas 7–10)  | 18 (29.5%)            | 7 (17.9%)                     | <b>0.041</b> |

**Observation:** Moderate to severe low back pain was significantly more common among women with previous cesarean section.

Table 6. Oswestry Disability Index (Odi)

| Odi Category        | Cesarean Group (N=61) | Vaginal Delivery Group (N=39) | P-Value      |
|---------------------|-----------------------|-------------------------------|--------------|
| Minimal Disability  | 16 (26.2%)            | 18 (46.2%)                    |              |
| Moderate Disability | 31 (50.8%)            | 16 (41.0%)                    |              |
| Severe Disability   | 14 (23.0%)            | 5 (12.8%)                     | <b>0.036</b> |

**Observation:** Functional disability was significantly greater in women with previous cesarean section.

Table 7. Clinical Features of Low Back Pain

| Clinical Feature             | Cesarean Group (N=61) | Vaginal Delivery Group (N=39) | P-Value |
|------------------------------|-----------------------|-------------------------------|---------|
| Pain Radiating To Lower Limb | 20 (32.8%)            | 9 (23.1%)                     | 0.296   |
| Lumbar Muscle Spasm          | 28 (45.9%)            | 13 (33.3%)                    | 0.214   |
| Restricted Lumbar Movements  | 24 (39.3%)            | 11 (28.2%)                    | 0.258   |
| Positive Slr Test            | 9 (14.8%)             | 5 (12.8%)                     | 0.781   |

**Observation:** Clinical manifestations were more frequent in the cesarean group but without statistically significant differences.

Table 8. Risk Factors Associated With Chronic Low Back Ache

| Risk Factor                     | Low Back Ache Present (N=100) | No Low Back Ache (N=100) | P-Value      |
|---------------------------------|-------------------------------|--------------------------|--------------|
| Bmi $\geq 30$ Kg/M <sup>2</sup> | 34 (34.0%)                    | 19 (19.0%)               | <b>0.017</b> |
| $\geq 2$ Cesarean Sections      | 27 (27.0%)                    | 12 (12.0%)               | <b>0.008</b> |
| Heavy Physical Activity         | 41 (41.0%)                    | 29 (29.0%)               | 0.076        |
| Age >35 Years                   | 46 (46.0%)                    | 39 (39.0%)               | 0.318        |

**Observation:** Obesity and multiple cesarean sections were significantly associated with chronic low back ache.

Table 9. Treatment Received For Low Back Ache

| Treatment        | Cesarean Group (N=61) | Vaginal Delivery Group (N=39) | P-Value |
|------------------|-----------------------|-------------------------------|---------|
| Analgesics Only  | 22 (36.1%)            | 17 (43.6%)                    |         |
| Physiotherapy    | 27 (44.3%)            | 14 (35.9%)                    |         |
| Combined Therapy | 12 (19.6%)            | 8 (20.5%)                     | 0.701   |

**Observation:** Physiotherapy was more frequently required among women with previous cesarean section.

Table 10. Overall Association between Cesarean Section and Chronic Low Back Ache

| Variable                  | Odds Ratio (95% CI) | P-Value      |
|---------------------------|---------------------|--------------|
| Previous Cesarean Section | 2.45 (1.37–4.39)    | <b>0.002</b> |

**Observation:** Women with a history of cesarean section had 2.45 times higher odds of developing chronic low back ache compared with women who had only vaginal deliveries.

## DISCUSSION

The present hospital-based study evaluated the association between previous cesarean section and chronic low back ache in multiparous women. The findings demonstrated that chronic low back pain was significantly more prevalent among women with a history of cesarean section compared with women who had only vaginal deliveries. Women in the cesarean group also experienced greater pain severity and higher functional disability scores, suggesting a possible relationship between cesarean delivery and persistent postpartum musculoskeletal symptoms.

The demographic characteristics of both study groups, including age, body mass index, occupation, and parity, were comparable, thereby minimizing potential confounding effects. Similar baseline characteristics have been reported in previous observational studies investigating postpartum low back pain, allowing meaningful comparison of outcomes (6,9).

In the present study, 61% of women with previous cesarean section reported chronic low back ache compared with 39% of women with previous vaginal delivery. This significant difference supports the hypothesis that cesarean delivery may increase the likelihood of persistent low back pain. Surgical disruption

of the abdominal wall, postoperative muscle weakness, scar tissue formation, and delayed restoration of core muscle function may contribute to impaired spinal stability and chronic pain (7,8). Comparable findings have been reported by Eisenach et al., who identified cesarean delivery as a risk factor for persistent postpartum pain (12).

Women with previous cesarean section demonstrated significantly higher Visual Analog Scale (VAS) pain scores and greater Oswestry Disability Index (ODI) scores than women with vaginal deliveries. These findings indicate not only increased pain intensity but also greater limitation in daily activities. Similar observations have been described by Mogren and colleagues, who reported persistent postpartum pelvic and low back pain affecting physical function and quality of life (4,13).

The present study identified obesity and multiple cesarean sections as significant risk factors associated with chronic low back ache. Increased body mass index imposes greater mechanical loading on the lumbar spine, while repeated surgical trauma may further compromise abdominal muscle strength and spinal support. These observations agree with previous reports identifying obesity, repeated pregnancies, and multiple cesarean deliveries as important predictors of chronic postpartum back pain (9,10).

Although clinical features such as radiating pain, lumbar muscle spasm, restricted spinal movements, and positive straight-leg-raising test were more frequent in women with previous cesarean section, these differences did not achieve statistical significance. This suggests that chronic pain following cesarean section is more likely related to musculoskeletal dysfunction rather than overt neurological pathology.

Physiotherapy utilization was higher among women with previous cesarean section, reflecting greater functional impairment and the need for rehabilitation. Early postpartum physiotherapy focusing on abdominal strengthening, posture correction, pelvic stabilization, and lumbar muscle conditioning has been shown to improve recovery and reduce long-term disability (14).

The calculated odds ratio of 2.45 indicates that women with previous cesarean section had more than twice the risk of developing chronic low back ache compared with women who underwent only vaginal delivery. This clinically significant association highlights the importance of identifying high-risk women during postpartum follow-up and implementing preventive rehabilitation strategies.

The present study has several strengths, including a relatively large sample size, inclusion of an appropriate control group, and standardized assessment of pain severity and functional disability. However, certain limitations should be acknowledged. Being a hospital-based cross-sectional study, causal relationships cannot be definitively established. Recall bias regarding pain history and lack of radiological evaluation may have influenced findings. Furthermore, psychological factors, occupational ergonomics, and long-term physical activity were not assessed.

Overall, the findings suggest that previous cesarean section is significantly associated with chronic low back ache in multiparous women. Routine postpartum counseling, weight management, early physiotherapy, and strengthening exercises may help reduce chronic musculoskeletal morbidity and improve long-term maternal quality of life.

## CONCLUSION

The present study demonstrated a significant association between previous cesarean section and chronic low back ache in multiparous women. Women with a history of cesarean delivery had a higher prevalence of chronic low back pain, greater pain severity, and

increased functional disability compared with those who had only vaginal deliveries. Obesity and multiple cesarean sections were identified as additional risk factors. Early postpartum physiotherapy, core strengthening exercises, and appropriate follow-up may help reduce the burden of chronic low back pain and improve long-term maternal quality of life.

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