Vol. 2 No. 3 (2025)
ONLINE ISSN :3007-309X
PRINT ISSN :3007-3081
Journal of Medical & Health Sciences Review

ASSOCIATION OF SHORT PERINEAL BODY LENGTH WITH OBSTETRIC ANAL SPHINCTER INJURIES IN PRIMIGRAVIDA UNDERGOING VAGINAL DELIVERY WITH EPISIOTOMY

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ARTICLE INFO:

Keywords:
Perineal Body Length, Obstetric Anal Sphincter Injuries, Primigravida, Episiotomy, Vaginal Delivery, Perineal Tears.

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Article History:
Received:7 July 2025
Accepted: 31 July 2025
Published: 8 August 2025

ABSTRACT

Background: Obstetric anal sphincter injuries (OASI), remain a major complication of vaginal childbirth. A reduced perineal body length (PBL) suggested as an important risk factor for OASI.
Objective: To determine whether short PBL is associated with a higher likelihood of OASI in primigravida delivering vaginally with episiotomy.
Methods: This study was carried out in the Department of Obstetrics & Gynecology, Sir Ganga Ram Hospital, Lahore,from 1 April 2025 to 3 July 2025 . A total of 60 primigravida were recruited, divided into Group A with short PBL (≤3.0 cm, n=30) and Group B with longer PBL (>3.0 cm, n=30). Incidence of OASI was compared between groups, with additional stratified analyses performed for maternal age, body mass index (BMI), and neonatal birth weight. Data were analyzed using SPSS version 25.
Results: Mean PBL was significantly shorter in Group A (2.8 ± 0.1 cm) than in Group B (3.5 ± 0.2 cm, $p < 0.001$). OASI occurred more frequently in women with short PBL—third-degree tears in 50% and fourth-degree in 23.3%—compared with 16.7% and 0% in Group B ($p < 0.001$). Subgroup analyses indicated that women aged ≤25 years, those with BMI ≥25 kg/m², and those delivering infants >3.5 kg were at greater risk of OASI when PBL was short.
Conclusion: Shorter PBL is significantly associated with a higher incidence of OASI in primigravida women undergoing episiotomy-assisted vaginal delivery. Routine prenatal measurement of PBL, combined with consideration of maternal and fetal factors, could help in planning targeted preventive measures to reduce severe perineal trauma.

INTRODUCTION:

The perineal body serves as a central point of attachment for several pelvic floor muscles, including the posterior fibers of the bulbocavernosus, the superficial and deep transverse perineal muscles, and the anterior part of the external anal sphincter. In women who have not previously given birth, the perineum is typically firm and resistant.[1]

During vaginal delivery, perineal trauma is common, with reported rates ranging from 53% to 79%. Among these, third- and fourth-degree lacerations are grouped as obstetric anal sphincter injuries (OASI). Timely recognition and appropriate management of OASI are crucial to avoid serious complications, such as fecal incontinence, urgency, and rectovaginal fistula.[2,3] These injuries contribute significantly to maternal morbidity, making early detection and intervention essential to limit long-term consequences.[4]

The current trend favors a *restrictive approach*, where episiotomy is reserved for specific high-risk circumstances such as instrumental deliveries, shoulder dystocia, rigid perineum, occiput posterior position, or breech presentation.[5] Perineal body length has been suggested as a factor influencing the likelihood of requiring episiotomy and its related outcomes.[5] In light of evidence linking routine episiotomy with more severe perineal injuries, the World Health Organization (WHO) advocates for a selective practice.[7,8] Furthermore, episiotomy does not eliminate the risk of OASI, and its protective value remains uncertain.[9]

Research has demonstrated an association between perineal body length and risk of severe perineal tears. One study found that a shorter perineal body length (≤3.5 cm) was significantly associated with third- and fourth-degree lacerations, with an odds ratio of 32 (95% CI: 1.3–807, P<0.1).[10] An Indonesian study reported that 76.2% of women with perineal tears had short perineal length compared to 32.8% in those without, indicating a fivefold increase in risk ($p<0.05$).[11] Similarly, another study noted that 80% of cases with perineal tears had short perineal length versus 10% in controls ($p<0.05$).[12]

The research aims to explore the association of short perineal body length with OASI in primigravida women undergoing vaginal delivery with episiotomy. While existing literature supports a strong relationship, very few investigations have been conducted locally. By generating data from our population, this study aims to clarify whether short perineal body length contributes significantly to the occurrence of severe perineal trauma. The outcomes will provide evidence to strengthen clinical practice, improve delivery care, and ultimately help in reducing the risk of OASI.

METHODOLOGY

This case-control study was conducted in the Department of Obstetrics & Gynecology, Sir Ganga Ram Hospital, Lahore, from 1 April 2025 to 3 July 2025 after approval of the synopsis. A total of 60 primigravida females fulfilling the inclusion criteria were enrolled through non-probability consecutive sampling, with 30 patients in each group: Group A (cases) with perineal body length ≤3.0 cm and Group B (controls) with perineal body length >3.0 cm. The sample size was calculated using the WHO calculator at a 5% significance level, 90% power, and an expected prevalence of short perineal body length of 76.2% in cases with perineal tear and 32.8% in controls without perineal tear. Eligible participants were primigravida females aged 18–40 years, at a gestational age >37 weeks, undergoing spontaneous labour in the latent phase, planned for normal vaginal delivery with episiotomy, and with an estimated fetal weight <4 kg on ultrasound. Patients with gestational diabetes, medical disorders (such as anemia, chronic hypertension, or pre-existing diabetes), antepartum hemorrhage, induced labour, instrumental or operative vaginal delivery, or fetal macrosomia (>4 kg) were excluded. After informed consent,

relevant demographic and obstetric data (age, BMI, gestational age, booking status, type of labour) were recorded. Perineal body length was measured from the posterior fourchette to the mid-anus using a ruler and recorded to the nearest tenth of a centimeter; ultrasound was used to confirm estimated fetal weight. All information was documented in a predesigned proforma. Data were analyzed using SPSS version 25.0.

RESULT

A total of 60 primigravida women meeting the inclusion criteria were enrolled in the study, with 30 women in Group A (short perineal body length [PBL] ≤3.0 cm) and 30 women in Group B (longer PBL >3.0 cm). In Group A, 12 women (40.0%) were ≤25 years and 18 (60.0%) were >25 years, whereas in Group B, 10 women (33.3%) were ≤25 years and 20 (66.7%) were >25 years ($\chi^2 = 0.53$, $p = 0.47$). Regarding BMI, 12 women (40.0%) in Group A had BMI <25 kg/m², compared to 14 women (46.7%) in Group B ($\chi^2 = 0.27$, $p = 0.60$). Mean gestational age was similar between the groups (Group A: 39.1 ± 1.2 weeks; Group B: 39.0 ± 1.1 weeks; $t = 0.41$, $p = 0.68$) (Table 1).

The mean PBL was significantly lower in Group A (2.8 ± 0.1 cm) compared to Group B (3.5 ± 0.2 cm), with a statistically significant difference ($t = 14.2$, $p < 0.001$) (Table 2).

The frequency of obstetric anal sphincter injuries (OASI) differed markedly between the two groups. In Group A, 15 women (50.0%) sustained a 3rd-degree tear and 7 women (23.3%) had a 4th-degree tear, while only 8 women (26.7%) had no OASI. In contrast, in Group B, 25 women (83.3%) had no OASI, 5 (16.7%) experienced a 3rd-degree tear, and none had a 4th-degree tear. This difference was highly significant ($\chi^2 = 18.75$, $p < 0.001$) (Table 3).

Stratification by age revealed that among women ≤25 years in Group A, 4 (33.3%) had no OASI, 5 (41.7%) had a 3rd-degree tear, and 3 (25.0%) had a 4th-degree tear, compared to 8 (80%), 2 (20%), and 0 in Group B, respectively ($\chi^2 = 6.21$, $p = 0.045$). Among women >25 years, OASI remained more frequent in Group A than Group B, indicating that shorter PBL increased risk irrespective of age (Table 4).

Analysis by BMI showed that in women with BMI <25 kg/m², 4 (33.3%) in Group A had no OASI, 6 (50.0%) had 3rd-degree tears, and 2 (16.7%) had 4th-degree tears, compared to 12 (85.7%), 2 (14.3%), and 0 in Group B ($\chi^2 = 7.01$, $p = 0.030$). Similar trends were observed in women with BMI ≥25 kg/m², further confirming that shorter PBL is associated with higher OASI risk across BMI categories (Table 5).

Stratification by fetal weight indicated that OASI frequency increased with heavier babies, particularly in Group A. For fetal weight <3.0 kg, 2 women (33.3%) had no OASI, 3 (50.0%) had 3rd-degree tears, and 1 (16.7%) had a 4th-degree tear in Group A, compared to 6 (85.7%), 1 (14.3%), and 0 in Group B ($\chi^2 = 4.98$, $p = 0.082$). Among fetal weights of 3.0–3.5 kg and >3.5 kg, women in Group A consistently had higher rates of 3rd- and 4th-degree tears compared to Group B (Table 6).

Characteristic	Category	Group A: Short PBL ≤3.0 cm (n=30)	Group B: Longer PBL >3.0 cm (n=30)	χ^2 / p-value
Age group (years)	≤25	12	10	0.53 / 0.47
	>25	18	20	
BMI (kg/m²)	<25	12	14	0.27 / 0.60
	≥25	18	16	
Booking status	Booked	20	19	0.07 / 0.79
	Un-booked	10	11	

Gestational age (weeks)	Mean ± SD	39.1 ± 1.2	39.0 ± 1.1	t = 0.41 / 0.68

Table 1: Baseline demographic and obstetric characteristics of primigravida

Group	Mean PBL (cm) ± SD	t-test / p-value
Group A: Short PBL ≤3.0 cm	2.8 ± 0.1	—
Group B: Longer PBL >3.0 cm	3.5 ± 0.2	t = 14.2 / <0.001

Table 2: Comparison of mean perineal body length (PBL)

Outcome	Group A: Short PBL ≤3.0 cm (n=30)	Group B: Longer PBL >3.0 cm (n=30)	χ^2 / p-value
No OASI	8 (26.7%)	25 (83.3%)	χ^2 = 18.75 / <0.001
3rd-degree tear	15 (50.0%)	5 (16.7%)	
4th-degree tear	7 (23.3%)	0 (0%)	

Table 3: Frequency of obstetric anal sphincter injuries (OASI) in primigravida women by perineal body length group

Age group (years)	Group A: Short PBL ≤3.0 cm (n=30)	Group B: Longer PBL >3.0 cm (n=30)	χ^2 / p-value
≤25	No OASI: 4 (33.3%), 3rd: 5 (41.7%), 4th: 3 (25.0%)	No OASI: 8 (80%), 3rd: 2 (20%), 4th: 0	χ^2 = 6.21 / 0.045
>25	No OASI: 4 (22.2%), 3rd: 10 (55.6%), 4th: 4 (22.2%)	No OASI: 17 (85%), 3rd: 3 (15%), 4th: 0	

Table 4: Stratification of obstetric anal sphincter injuries (OASI) by age group among women with short and longer perineal body length (PBL)

BMI (kg/m²)	Group A: Short PBL ≤3.0 cm (n=30)	Group B: Longer PBL >3.0 cm (n=30)	χ^2 / p-value
<25	No OASI: 4 (33.3%), 3rd: 6 (50.0%), 4th: 2 (16.7%)	No OASI: 12 (85.7%), 3rd: 2 (14.3%), 4th: 0	χ^2 = 7.01 / 0.030
≥25	No OASI: 4 (22.2%), 3rd: 9 (50.0%), 4th: 5 (27.8%)	No OASI: 13 (81.3%), 3rd: 3 (18.7%), 4th: 0	

Table 5: Stratification of OASI by BMI category in women with short and longer perineal body length (PBL)

Fetal weight (kg)	Group A: Short PBL ≤3.0 cm (n=30)	Group B: Longer PBL >3.0 cm (n=30)	χ^2 / p-value
<3.0	No OASI: 2 (33.3%), 3rd: 3 (50.0%), 4th: 1 (16.7%)	No OASI: 6 (85.7%), 3rd: 1 (14.3%), 4th: 0	χ^2 = 4.98 / 0.082
3.0–3.5	No OASI: 5 (27.8%), 3rd: 10 (55.6%), 4th: 4 (16.7%)	No OASI: 14 (87.5%), 3rd: 2 (12.5%), 4th: 0	
>3.5	No OASI: 1 (16.7%), 3rd: 2 (33.3%), 4th: 3 (50.0%)	No OASI: 5 (71.4%), 3rd: 2 (28.6%), 4th: 0	

Table 6: Stratification of OASI by fetal weight in women with short and longer perineal body length (PBL)

DISCUSSION

The association between perineal body length (PBL) and obstetric anal sphincter injuries (OASI) in primigravida women undergoing vaginal delivery with episiotomy has garnered significant attention in recent obstetric research. This study aimed to elucidate this relationship, providing valuable insights into potential risk factors for OASI.[12] Our findings indicate a significant correlation between shorter PBL and an increased incidence of OASI. Women in Group A (short PBL ≤3.0 cm) demonstrated a higher frequency of third-degree (50%) and fourth-degree (23.3%) perineal tears compared with those in Group B (longer PBL >3.0 cm), who showed a considerably lower occurrence of such injuries. These results are consistent with earlier research, which has highlighted short PBL as an important predictor of severe perineal lacerations during vaginal birth. [13] Djusad et al. (2021) reported that women with a PBL ≤3.0 cm had a significantly greater likelihood of sustaining third- or fourth-degree tears. [11]

When stratified by age, it was observed that women aged ≤25 years in the short PBL group experienced a higher incidence of OASI, with 41.7% sustaining third-degree and 25% fourth-degree injuries. Conversely, women older than 25 years within the same group showed a lower frequency of OASI. This suggests that younger maternal age, in combination with reduced PBL, further elevates the risk of obstetric anal sphincter injury. Supporting this observation, **Lane et al. (2017)** identified younger maternal age as a significant determinant of severe perineal tears. [10] Maternal BMI was also found to influence OASI risk. In Group A, women with a BMI ≥25 kg/m² experienced higher rates of OASI, with 50% sustaining third-degree and 27.8% fourth-degree tears. This finding corresponds with other studies that have reported elevated BMI as a contributory risk factor. [14] With respect to neonatal birth weight, our study showed that mothers delivering babies weighing >3.5 kg in Group A had a higher prevalence of OASI, including 50% with fourth-degree tears. Although this association was not statistically significant, the trend highlights the potential influence of fetal macrosomia in predisposing women to severe perineal trauma. Previous literature has similarly reported that larger fetal size increases the risk of OASI.[10] Taken together, these findings emphasize the clinical value of assessing PBL in antenatal care, particularly among primigravida women. Early identification of women with a short PBL may allow targeted preventive strategies—such as customized perineal protection during childbirth—to minimize OASI risk. Factoring maternal age, BMI, and fetal weight into risk assessment models can further enhance the ability to recognize women at greater risk of severe lacerations.

Nevertheless, certain limitations must be acknowledged. The relatively small sample size restricts the generalizability of our conclusions. Moreover, the study was carried out in a single center, limiting population diversity. Additionally, variables such as the method and timing of episiotomy, along with the experience level of the obstetrician, were not standardized, which may have influenced the observed outcomes.

CONCLUSION

In conclusion, our study reaffirms that a shorter PBL is strongly linked with a higher likelihood of OASI among primigravida women undergoing vaginal delivery with episiotomy. The results underscore the importance of incorporating PBL measurement into routine antenatal evaluations, alongside factors such as maternal age, BMI, and fetal weight, to better identify women at greater risk of severe perineal tears. By applying targeted

preventive measures tailored to these risk factors, maternal outcomes may be improved, and the overall burden of OASI can be reduced.

REFERENCES:

1. Murphy DJ. Labour: normal and abnormal. In Obstetrics by Ten Teachers 2017 May 18 (pp. 193-232). CRC Press.
2. Mohd Raihan FS, Kusuma J, Nasution AA. Neonatal head circumference as a risk factor for obstetric anal sphincter injuries: a systematic review and meta-analysis. Am J Obstet Gynecol MFM. 2023;5(8):101047.
3. Jansson MH, Franzén K, Hiyoshi A, Tegerstedt G, Dahlgren H, Nilsson K. Risk factors for perineal and vaginal tears in primiparous women – the prospective POPRACT-cohort study. BMC Pregnan Childbirth. 2020;20(1):749.
4. Spinelli A, Laurenti V, Carrano FM, Gonzalez-Díaz E, Borycka-Kiciak K. Diagnosis and treatment of obstetric anal sphincter injuries: new evidence and perspectives. Journal of clinical medicine. 2021;10(15).
5. Thakur M, Bal H, Tambe V, Singireddy N. Evaluation of Episiotomy in Present Day Obstetric Practice. Med J Dr DY Patil Univ. 2020;13(5):529-34.
6. Radnia N, Khansari S, Jiriaei N, Hosseini SA, Salemi L, Hamoon M. The relationship between perineal size and episiotomy during delivery. J Med Life. 2022;15(11):1379.
7. Faden YA, Fatani AM, Fallatah BM, Rawa TS, Almasri SA, El Amin NO, et al. Examining the Association Between Episiotomy and Severe Perineal Tears in a Tertiary Care Center Implementing a Restrictive Episiotomy Policy. Cureus. 2022;4(11):e31606.
8. Mboua Batoum V, Ngo Um Meka E, Essiben F, Robinson ME. Perineal body length and prevention of perineal lacerations during delivery in cameroonian primigravid patients. International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics. 2021;154(3):481-4.
9. Atef A, Fahmy TA-E, Abu-Elfotouh II, Kotb MMM. The Safety of Selective Episiotomy Compared to Routine Episiotomy During Vaginal Birth in Primigravida in Cairo University Hospitals. Egypt J Hosp Med. 2022;89(1):5023-7.
10. Lane TL, Chung CP, Yandell PM, Kuehl TJ, Larsen WI. Perineal body length and perineal lacerations during delivery in primigravid patients. Proceedings (Baylor University Medical Center). 2017;30(2):151-3.
11. Djusad S, Purwosunu Y, Hidayat F. Relationship between Perineal Body Length and Degree of Perineal Tears in Primigravidas Undergoing Vaginal Delivery with Episiotomy. Obstet Gynecol Int. 2021;2021:2621872.
12. Ganiga P, Sharma RA, Pitty N. Relationship between perineal body length and the occurrence of perineal lacerations in low risk primigravidae: a prospective observational study. Int J Reprod Contracept Obstet Gynecolo. 2022;11(2):420-7.
13. Ali M, et al. Risk Factors for Obstetric Anal Sphincter Injuries among Primigravida Women. *Obstet Gynecol Int*. 2020;2020:6035974.
14. Al Ghamdi DS. A retrospective study of the incidence and predisposing factors of third- and fourth-degree perineal tears. *Saudi Med J*