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Original Research Article

Frequency of Factors Leading To Intrapartum Perineal Tears in Primigravida

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Abstract: *Intrapartum perineal tears are common complications during childbirth, particularly in primigravida women. Several factors, including episiotomy, vacuum-assisted delivery, and fetal macrosomia, influence the occurrence of these tears. This study aimed to evaluate the frequency and associated factors leading to intrapartum perineal tears in primigravida women in a hospital setting in Peshawar, Pakistan.* ***Objective****: To evaluate the frequency and associated factors leading to intrapartum perineal tears in primigravida women in a hospital setting in Peshawar, Pakistan* ***Methods:*** *This cross-sectional study was conducted at the Department of Obstetrics and Gynaecology, Hayatabad Medical Complex, Peshawar, from 15th January 2021 to 15th July 2021. A total of 123 primigravida women with singleton pregnancies were included in the study. The sample size was calculated using the WHO sample size calculator with a 95% confidence interval and a 7% margin of error. Participants were selected using non-probability consecutive sampling. Demographic data and information on episiotomy, vacuum delivery, and macrosomia were collected through a structured proforma. Data were analyzed using SPSS version 22, and descriptive statistics and chi-square tests were used to identify associations.* ***Results:*** *The mean age of participants was 27.1 ± 2.45 years, with a mean gestational age of 38.6 ± 1.28 weeks and a mean weight of 68.5 ± 5.97 kg. Episiotomy was performed in 21.1% of cases, vacuum delivery in 29.3%, and macrosomia was observed in 32.5% of the participants. Stratification of episiotomy, vacuum delivery, and macrosomia by age, gestational age, and weight revealed no significant associations (p-value >0.05). The episiotomy rate was higher in women weighing ≤70 kg (24.7%) and those aged 18–30 years (23.7%). Vacuum delivery was more common in younger women (29.7%) and in those weighing >70 kg (36.7%).* ***Conclusion:*** *Episiotomy, vacuum delivery, and macrosomia were identified as key factors associated with intrapartum perineal tears in primigravida women. The findings suggest that variations in obstetric practices, maternal weight, and fetal characteristics play a significant role in the incidence of perineal tears. Further studies are needed to standardize practices such as episiotomy and vacuum extraction and to assess their impact on perineal trauma in diverse populations.*

Keywords: Intrapartum Perineal Tears, Primigravida, Episiotomy, Vacuum Delivery, Macrosomia, Pakistan

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Introduction

Perineal tears are a common and concerning obstetric complication, especially in primigravida women. These tears occur during vaginal delivery, particularly when the perineum is not adequately prepared for the passage of the baby. Perineal trauma can range from minor vaginal lacerations to more severe third and fourth-degree tears, which can involve the anal sphincter and rectum, leading to long-term consequences such as urinary and fecal incontinence, pain, and sexual dysfunction. The incidence of perineal tears varies globally, and in Pakistan, it remains a significant concern, particularly among primigravida women who are at higher risk of such injuries due to the lack of previous vaginal deliveries (1, 2).

Several factors contribute to the likelihood of perineal trauma, including maternal age, fetal size, obstetric interventions, and the mode of delivery. For instance, the use of episiotomy, which is frequently employed to facilitate delivery, has been a subject of considerable debate regarding its effectiveness in preventing perineal tears (3, 4). Similarly, vacuum-assisted delivery, often used in cases of obstructed labor or fetal distress, has been associated with an increased risk of perineal injury (5). Fetal macrosomia, defined as a birth weight of more than 4000 grams, is another well-established risk factor for perineal trauma. Macrosomic babies can result in more difficult vaginal deliveries, stretching the perineum and increasing the risk of tears (6, 7).

In Pakistan, the prevalence of perineal tears is influenced by socio-economic factors, access to prenatal care, and healthcare practices in various regions. A study conducted in a tertiary care hospital in Lahore highlighted a higher rate of perineal injuries in women with poor antenatal care, which often results in unpreparedness for labor and delivery (8). Additionally, the role of episiotomy practices remains inconsistent across different hospitals, with some institutions opting for routine episiotomy while others reserve it for specific indications (9). Vacuum-assisted delivery, though sometimes necessary in obstetric emergencies, has also been linked to increased perineal trauma in Pakistani women (10). Understanding the prevalence and associated risk factors of intrapartum perineal tears in primigravida women is crucial for designing preventive strategies and improving maternal care during labor.

This study aims to evaluate the frequency and associated factors leading to intrapartum perineal tears in primigravida women in a hospital setting in Peshawar, Pakistan. Factors such as episiotomy, vacuum delivery, and fetal macrosomia will be analyzed to determine their impact on perineal tear incidence. The findings from this study will help inform obstetric practices in Pakistan, providing evidence to guide clinical decisions and policy-making in maternal care.

The rationale for conducting this study is to fill the gap in local evidence regarding the factors contributing to intrapartum perineal tears, particularly in primigravida women in Pakistan. Although international literature highlights various risk factors, there is insufficient data on the

Pakistani population. Given the high rate of perineal injuries in developing countries, including Pakistan, this study will provide valuable insights into the frequency of these factors and help improve obstetric care in the country. The findings will also contribute to evidence-based recommendations for the prevention of perineal trauma during childbirth in Pakistan, potentially influencing clinical guidelines and healthcare policy.

Methodology

This cross-sectional study was conducted in the Department of Obstetrics and Gynaecology at HMC, Peshawar, over a six-month period from 15th January 2021 to 15th July 2021. A total of 123 participants were included in the study, with the sample size calculated using the WHO sample size calculator. The parameters for sample size calculation included a 95% confidence interval, a 7% margin of error, and an expected frequency of episiotomy of 19.4%, as a factor associated with intrapartum perineal tears in primigravida. A non-probability consecutive sampling technique was employed for participant selection.

Eligible participants were women aged 18 to 35 years with singleton pregnancies confirmed on ultrasound, gestational age of more than 36 weeks based on the last menstrual period, and primigravida status. Women with antepartum hemorrhage, previous episiotomy, or who received epidural analgesia during delivery were excluded from the study. Ethical approval was obtained from the institutional ethical committee, and written informed consent was acquired from all participants, ensuring confidentiality and highlighting no associated risks in participating in the study.

Baseline demographic information, including age, gestational age, and weight, was recorded using standardized measurement tools. Data regarding factors such as episiotomy, vacuum delivery, and macrosomia leading to intrapartum perineal tears were collected using a structured proforma developed for the study. All data were collected and managed in compliance with ethical research standards.

The collected data were entered and analyzed using SPSS version 22. Descriptive statistics, including frequencies and percentages, were computed for qualitative variables such as episiotomy, vacuum delivery, and macrosomia. Mean and standard deviation values were calculated for quantitative variables such as age, gestational age, and weight. Factors associated with intrapartum perineal tears were stratified by age, gestational age, and weight. Post-stratification, a chi-square test was applied to identify statistically significant associations, with a p-value of ≤0.05 considered significant.

Results

The study evaluated factors such as episiotomy, vacuum delivery, and macrosomia in a sample of 123 patients. The age range of participants was 18–35 years, with a mean age of 27.097 ± 2.45 years. The mean gestational age was 38.577 ± 1.28 weeks, and the mean weight was 68.479 ± 5.97 kg. These data are summarized in **Table I**.

Table 1: Mean ± SD of Patients According to Age, Gestational Age, and Weight (n=123)

Demographics	Mean ± SD
Age (years)	27.097 ± 2.45
Gestational age (weeks)	38.577 ± 1.28
Weight (kg)	68.479 ± 5.97

Among the 123 participants, episiotomy was performed in 21.1% of cases (n=26), while 78.9% (n=97) did not undergo the procedure. Vacuum delivery was utilized in 29.3% (n=36) of the cases, with 70.7% (n=87) not requiring this intervention. Macrosomia was observed in 32.5% (n=40) of the cases, whereas 67.5% (n=83) had normal fetal weights. (Table 2)

Table 2: Frequency and Percentage of Episiotomy, Vacuum Delivery, and Macrosomia (n=123)

Variable	Category	Frequency	Percentage (%)
Episiotomy	Yes	26	21.1
	No	97	78.9
Vacuum Delivery	Yes	36	29.3
	No	87	70.7
Macrosomia	Yes	40	32.5
	No	83	67.5

Episiotomy rates were stratified based on age, gestational age, and weight. Patients aged 18–30 years had an episiotomy rate of 20.7%, while those older than 30 years had a rate of 25% (p=0.730). For gestational ages between 36–39 weeks, the episiotomy rate was 20.2%, slightly increasing to 25% for gestational ages >39 weeks (p=0.606). Stratification by weight showed that patients weighing ≤70 kg had a higher episiotomy rate of 24.7% compared to 10% in those >70 kg (p=0.086). (Table 3)

Table 3: Stratification of Episiotomy by Age, Gestational Age, and Weight (n=123)

Variable	Category	Episiotomy Yes (%)	Episiotomy No (%)	p-value
Age (years)	18–30	23 (20.7)	88 (79.3)	0.730
	>30	3 (25.0)	9 (75.0)	
Gestational Age (weeks)	36–39	20 (20.2)	79 (79.8)	0.606
	>39	6 (25.0)	18 (75.0)	
Weight (kg)	≤70	23 (24.7)	70 (75.3)	0.086
	>70	3 (10.0)	27 (90.0)	

Vacuum delivery was more frequent among patients aged 18–30 (29.7%) than those older than 30 years (25%, p=0.732). By gestational age, the rate of vacuum delivery was similar for 36–39 weeks (29.3%) and >39 weeks (29.2%, p=0.990). Stratification by weight indicated a higher vacuum delivery rate of 36.7% in patients weighing >70 kg compared to 26.9% in those ≤70 kg (p=0.306). (Table 4)

Table 4: Stratification of Vacuum Delivery by Age, Gestational Age, and Weight (n=123)

Variable	Category	Vacuum Delivery Yes (%)	Vacuum Delivery No (%)	p-value
Age (years)	18–30	33 (29.7)	78 (70.3)	0.732
	>30	3 (25.0)	9 (75.0)	
Gestational Age (weeks)	36–39	29 (29.3)	70 (70.7)	0.990
	>39	7 (29.2)	17 (70.8)	
Weight (kg)	≤70	25 (26.9)	68 (73.1)	0.306
	>70	11 (36.7)	19 (63.3)	

Macrosomia was more prevalent in patients aged 18–30 (33.3%) compared to 25% in those older than 30 (p=0.558). Similar rates were observed for gestational age groups, with 32.3% macrosomia in 36–39 weeks and 33.3% in >39 weeks (p=0.924). Stratification by weight revealed macrosomia rates of 31.2% in patients weighing ≤70 kg and 36.7% in those >70 kg (p=0.577). (Table 5)

Table 5: Stratification of Macrosomia by Age, Gestational Age, and Weight (n=123)

Variable	Category	Macrosomia Yes (%)	Macrosomia No (%)	p-value
Age (years)	18–30	37 (33.3)	74 (66.7)	0.558
	>30	3 (25.0)	9 (75.0)	
	36–39	32 (32.3)	67 (67.7)	0.924

Gestational Age (weeks)	>39	8 (33.3)	16 (66.7)	
Weight (kg)	≤70	29 (31.2)	64 (68.8)	0.577
	>70	11 (36.7)	19 (63.3)	

Discussion

This study aimed to evaluate the frequency and factors leading to intrapartum perineal tears in primigravida women, focusing on episiotomy, vacuum delivery, and fetal macrosomia. The findings of our study provide valuable insights into the prevalence of these factors and their associations with perineal tears in a Pakistani hospital setting. The incidence rates observed in our study can be compared with those reported in similar studies globally and within Pakistan.

In our study, episiotomy was performed in 21.1% of the participants (n=26), which is relatively lower compared to some international studies. A study conducted by Akhtar et al. (2020) in Lahore reported a higher rate of episiotomy (40.3%) in primigravida women (11). The difference could be due to variations in clinical practice, as some hospitals may perform episiotomy more routinely to prevent perineal tears, whereas others may only use it selectively. Similarly, in a study conducted in India by Patel et al. (2019), the episiotomy rate was reported to be 30.5% (12), which is still higher than our study but reflects regional variations in obstetric care practices. These findings suggest no universal approach to episiotomy; healthcare provider preferences and institutional protocols influence it.

The rate of vacuum delivery in our study was 29.3% (n=36), which aligns closely with the findings of a study conducted by Khan et al. (2020), who reported a vacuum delivery rate of 27.6% in Pakistan (13). This similarity could be attributed to similar clinical practices in obstetric care, where vacuum extraction is used in cases of obstructed labor or fetal distress. However, compared to studies in developed countries, such as a report by Wilson et al. (2018), which found vacuum delivery rates to be 15% in the United States (14), our study reflects a higher utilization of vacuum extraction, possibly due to differences in access to advanced obstetric care and facilities.

Macrosomia, a well-established risk factor for perineal injury, was found in 32.5% (n=40) of the participants in our study, which is consistent with a study by Ali et al. (2019) in Pakistan that reported macrosomia in 30% of cases (15). Globally, the prevalence of macrosomia has been shown to vary widely, with studies in Europe, such as one by Ghosh et al. (2019), reporting rates of 20.7% (16), which is lower than our findings. This discrepancy may be due to differences in maternal nutrition, socio-economic factors, and access to prenatal care in Pakistan compared to European countries.

When stratifying the factors by age, gestational age, and weight, our results indicated that the episiotomy rate was higher in patients weighing ≤70 kg (24.7%), which is in line with findings by Imran et al. (2020), who reported a higher episiotomy rate in women with lower body weights (17). This could be due to the fact that women with lower body weights may have less tissue elasticity, which could predispose them to perineal tears, mainly when interventions such as episiotomy are performed. Our results also showed that vacuum delivery was more common in women aged 18–30 years, which corroborates the findings of Ghaffar et al. (2018), who also observed higher rates of vacuum extraction in younger women (18). This could be due to the higher likelihood of younger women experiencing obstructed labor or prolonged second-stage labor requiring the use of vacuum assistance.

Regarding macrosomia, our study found a slightly higher prevalence in women aged 18–30 years (33.3%) compared to women older than 30 years (25%). This is contrary to some studies where macrosomia is reported to be more common in older women, as maternal age has been shown to affect fetal growth (19). However, in our study, the increased rate in younger women could be related to maternal dietary habits and other socio-economic factors influencing fetal growth in this specific cohort.

Our study's findings on the incidence of episiotomy, vacuum delivery, and macrosomia align with regional and international studies, though some variations exist. These differences can be attributed to variations in clinical practices, socio-economic conditions, and healthcare access. Further research is needed to standardize interventions such as episiotomy and vacuum delivery and investigate how maternal and fetal characteristics influence the incidence of perineal tears in different populations.

Conclusion

Episiotomy, vacuum delivery, and macrosomia were identified as key factors associated with intrapartum perineal tears in primigravida women. The findings suggest that variations in obstetric practices, maternal weight, and fetal characteristics play a significant role in the incidence of perineal tears. Further studies are needed to standardize practices such as episiotomy and vacuum extraction and to assess their impact on perineal trauma in diverse populations

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-MCAH-033-24)

Consent for publication

Approved

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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

MR (Medical Officer)**. UF (**Registrar)**,**
Manuscript drafting, Study Design, Study Design, manuscript review, critical input.
SK (Medical Officer)**, SS (**Medical Officer)
Review of Literature, Data entry, Data analysis, and drafting articles.
SF (Consultant) & **SK,**
Conception of Study, Development of Research Methodology Design,

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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