

Lower Genital Tract Injuries during Multiparous Vaginal Delivery in Tertiary Hospital of Western India: An Observational Study

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ABSTRACT

Background: Maternal expulsive force with direct compression from the fetal head exerts downward force on the pelvic floor during childbirth during childbirth; the pelvic floor is exposed to direct compression from the fetal head and to downward pressure from maternal expulsive efforts. These create alterations in the muscle's nerves and connective tissue. As parity increases, cumulative effect gives rise to various long-term and short complications.

Materials and methods: This present observational study is planned to evaluate the lower genital tract injuries following vaginal delivery with regard to their frequencies, types, severity, and complications. Most of the studies are conducted in primiparas. This study would be conducted in multiparas sustaining lower genital tract injuries; it may help to evolve the checklist of do's and don'ts.

Results: Out of 144 patients studied, 68.7% of patients had previous delivery. Out of which 51.4% had maximum injuries if compared to those with 2 or more injuries. Women with basal metabolic index (BMI) in the overweight and obese categories were more susceptible to lacerations with 2.6 and 1.98 odds ratios respectively. Induction and oxytocin also affect lower genital tract injuries causing a significant increase in their numbers whereas episiotomies have no significant change in lower genital tract injuries.

Conclusion: This study would give insight into various factors such as parity, labor induction, prolonged labor, precipitate labor, injudicious use of oxytocin, improper technique of episiotomy, assisted vaginal delivery, and instrumental delivery affecting the lower genital tract.

Keywords: Birth weight, Body mass index, Instrumental injuries, Maternal morbidity, Multiparous, Obstetric trauma, Perineal tears.

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INTRODUCTION

Obstetrical trauma following vaginal delivery has been reported since ancient times.¹ With advancements in the field of obstetrics, the incidence of severe perineal injury is decreased in developed countries but adversities associated with birth trauma remain high, especially in underdeveloped countries with few racial/ethnic differences.² Short-term morbidities due to vaginal lacerations, cervical tears, 1st-degree and 2nd-degree perineal tears, vulval and vaginal hematomas as well as episiotomies include pain and discomfort for a few days postpartum. Long-term morbidity affecting women well beyond postnatal period include urinary, gaseous, or fecal incontinence due to loss of urethral sphincter tone, 3rd and 4th-degree tears, and rarely, vesicovaginal or rectovaginal fistulas. The progressive decline in perinatal and maternal mortality rates has caused the shift of focus on maternal intrapartum morbidity including obstetric anal sphincter injury.³ Multiparous women having perineal trauma during their previous delivery have a higher risk of anal sphincter damage than those without trauma. This recurrence is not predictable antenatally. By the end of this study, we will be able to record the frequency and types of maternal lower genital tract injuries during vaginal delivery in multiparous women and their risk factors.

MATERIALS AND METHODS

this observational study consisted of multiparous women with singleton birth delivered vaginally with the cephalic presentation in our tertiary care institute with lower genital tract injuries from

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May 2016 to May 2018. Information regarding these patients was collected from the institute's registers and individual case papers. Total of 144 eligible and willing multiparous postpartum women were interviewed and examined for lower genital tract injuries such as perineal tears, paraurethral tears, and episiotomies. Participants were screened after delivery once vitally stable and were examined daily till discharge. As many as possible of them were followed up in the outpatient department after 1 week and examined again. Weight and height were recorded by nurses in the standard format

Table 1: Characters of perineal injuries

<i>Previous vaginal delivery</i>	<i>Total patients (n = 144)</i>	<i>Severe perineal injury (n = 71)</i>	<i>Extension of episiotomy (n = 78)</i>	<i>Third degree perineal tear (n = 21)</i>	<i>Fourth degree perineal tear (n = 2)</i>	<i>p-value < 0.05</i>
1 vaginal delivery	101	52 (51.48%)	58 (50.49%)	15 (14.85%)	1 (0.99)	
2 vaginal deliveries	34	15 (44.11%)	17 (38.23%)	3 (8.82%)	1 (2.94%)	
3 vaginal deliveries	7	3 (42.85%)	2 (28.57%)	3 (42.85%)	0	
4 vaginal deliveries	2	1 (50%)	1 (50%)	0	0	
Oxytocin use						0
Yes	29	18 (62.06%)	16 (55.17%)	7 (24.13%)	0	
No	122	53 (43.44%)	62 (50.81%)	14 (11.47%)	2 (1.63%)	
Episiotomy						0.14
Mediolateral	83	37 (44.57%)	46 (55.42%)	11 (13.25%)	1 (1.20%)	
None	51	34 (66.66%)	30 (58.82%)	10 (19.60%)	1 (1.96%)	
Mode of delivery						0
Spontaneous	114	49 (42.98%)	58 (50.87%)	21 (18.10%)	2 (1.72%)	
Instrumental delivery	30	22 (73.33%)	20 (51.28%)	8 (20.51%)	0	
Birth weight						
<2 kg	13	6 (46.15%)	5 (38.46%)	2 (15.38%)	0	
2–3 kg	51	23 (45.09%)	27 (52.94%)	6 (11.76%)	0	
3–3.5 kg	54	26 (48.14%)	30 (55.55%)	8 (14.81%)	2 (3.70%)	
3.5–4 kg	23	14 (60.83%)	14 (60.86%)	4 (17.39%)	0	
>4 kg	2	2 (100%)	2 (100%)	1 (50%)	0	

during the women’s first antenatal visit. Body mass index (BMI) is calculated in kg/m² from weight and height data respectively. Women were grouped as per BMI according to their World Health Organization (WHO) Asian BMI classification. Sultan’s classification was used to classify perineal injuries. Whereas other injuries were classified according to their anatomic location.

RESULTS

A total of 144 patients having injuries were studied. The mean age of the patients was 28 years ± 3 years and the mean gestational age at delivery was 37 weeks ± 2 weeks. Multiparous women with previous 1 vaginal delivery were 101 from the total of 144 (68.75%). Among them 34 (22.91%) patients had previous two vaginal deliveries, 7 (6.25%) had previous three vaginal deliveries, while 2 (1.38%) patients had previous four deliveries (Table 1).

The average biparietal diameter of Indian babies is 3.55 inches or 9 cm; anything above this value has a high probability of perineal injury.⁴ For this study, we have defined a large baby as a baby weight more than 3 kg at birth. From 144 patients 37.5% had baby weight between 3 and 3.5 kg. About 36.11% of delivered babies had a weight between 2 and 3 kg. Around 16 % of babies had weight in the range of 3.5–4 kg. Consensus regarding the weight of the baby shows that maximum injuries are seen in the weight group if 3.5–4 kg. Thus as shown in the table; 60.8% of patients had severe perineal injuries, 60.8% had extension of episiotomy and 17.3% had third-degree perineal tears (Table 1).

Cervical tears were seen in 19 patients, vaginal lacerations in 58 patients, and para-urethral tears in 9 patients. Anal sphincter injury was noted in 2 patients. Episiotomies were performed in 83 patients (32.24%) while perineal tears were seen in 58 (25.32%). Obstetrics injuries are mixed injuries and only one type cannot be isolated in all cases, therefore even if the total number of patients examined are 140, a number of obstetric injuries was 229 (Table 1).

From 144 patients, 101 women had previous vaginal delivery with severe perineal injury in 51.48%, an extension of episiotomy in 50.49%, 3rd-degree perineal tear in 38.23%, and 4th-degree tear in one woman. Labor augmentation with oxytocin also showed an increase in perineal injury from 43.4 to 62.06%, extension of episiotomy from 50.8 to 55.17%, and third-degree perineal tear from 11.4 to 24.1% (Table 1).

From the above numbers episiotomies seem to have reduced the incidence of severe perineal injuries from 66.66 to 44.57%. But these changes are not statistically significant as *p* > 0.05 (Table 1).

In multipara, the odds of lacerations are 2.69 times in the overweight category and 1.98 times in the obese category. But 3rd-degree tears were less in overweight females’ odds ratio being 0.69 with CI (0.11, 4.51) and in the obese category odds of tears were slightly high, i.e., 1.71 with CI (0.45, 6.43) (Table 2).

DISCUSSION

The most common lower genital tract injury is first-degree perineal tear which requires no suturing unless bleeding. Injuries like vaginal laceration, para urethral tear, third-degree perineal tear, fourth-degree perineal tear are commonest in first vaginal birth (para 0) but not exclusive. Multiparous patients with previous vaginal delivery can have similar injuries if history of obstetric perineal trauma, instrumental delivery, or large-sized baby. Among these cervical lacerations are commonest due to cervical scarring after previous vaginal birth. Risk factors of such injuries are unsupervised and premature bearing down causing cervical scar disruption and thus cervical tear.⁵

In the worldwide population, pelvimetry studies have shown that nutritional status largely affects pelvis type. Hence women from developed countries have predominantly dolichopelvic pelvis type whereas 50% of women from developing countries have mesatipellic or even brachypelvic pelvis type. Ethnicity also plays a

Table 2: Obesity affecting perineal injury outcome

BMI (kg/sqm)	n	No laceration	%	Laceration	%	Odd ratio
Normal (18.5–24.9)	29	20	68.97	9	31.03	
Overweight (25–29.9)	27	13	48.15	14	51.85	2.69 (0.88–8.21)
Obese (30+)	85	45	52.94	40	47.06	
Class I (30–34.9)	84	44	52.38	40	47.62	
Class II (35–39.9)	1	1	100	0	0	
Class III (40+)	0	0	0	0	0	0.52 (0.25–1.1)

role in this matter. Asians have more propensity of anal sphincter injuries compared to non-Asians.⁶ Third-degree tears were seen in 15.38% with birth weight <2 kg, 11.76% in 2–3 kg group, 14.81% in the 3–3.5 group, 17.39% in 3.5–4 kg group, and 150% in >4 kg. There was a positive association between third-degree perineal tears and birth weight over 3600–4000 g of statistical significance.⁷ Charles et al. also showed maximum injuries in the weight group of 3.5 to 3.9 kg, i.e., 603 out of 1320 cases studied. Also with baby weight >4 kg 23.6% had higher order perineal injuries.⁸

Zahida et al. conducted a study on the frequency and severity of perineal tears, where the use of oxytocin for augmentation was associated third degree tears.⁹ Hudelist et al. studied combined 3rd and 4th degree tears caused by oxytocin in which 23.9% were associated with augmentation with oxytocin.¹⁰ Haadem et al. had the same results, and they explained that it might be due to increased pressure on the perineum or the relatively inelastic vaginal tissue causing slow progress of labor, thus indicating the use of oxytocin and so the perineal tears.¹¹ In our study, no change was seen in the incidence of fourth-degree tear with oxytocin augmentation but we found a significant association between the use of oxytocin and an increase in severe perineal injuries, an extension of perineal injury, and third-degree perineal tears ($p < 0.001$). The effect of oxytocin on uterine contractions against pelvic floor muscles may have resulted in these injuries.¹²

A strong association was seen between episiotomy and perineal tears ($p < 0.001$) in our study. Bek and Laurberg showed a decreased risk of anal sphincter tear when mediolateral episiotomy was used in nulliparous women, but an increased risk when used in multiparous women. All studies show that midline episiotomy has an increased risk of severe perineal lacerations than intact perineum.⁷ Zahida et al. have shown that out of 105 patients given episiotomies 41 had 3rd-degree tears (39%) and 5 had 4th-degree tears (4.7%). In a group where episiotomies were not given 21.4% had 3rd-degree tears and 2.3% had 4th-degree tears, all these values being statistically significant ($p = 0.001$).⁹ Smith et al. also had results similar. In our study 3rd-degree perineal injury was seen in 13.25% of patients with episiotomy and 19.6% of patients without episiotomy. There was no evidence that episiotomy was associated with either an increased or decreased risk for OASIS.¹³

Hirayama et al. performed a cross-sectional study among 24 different countries and found no association between BMI and third- and fourth-degree lacerations.¹⁴ Lindholm and Altman found that maternal third and fourth-degree lacerations decreased with rising BMI whereas 1st and 2nd order lacerations increased.¹⁵ Similar results were seen in Diana et al. study. But we found severe lacerations more in patients with class I obesity and overweight patients with an odds ratios of 1.98 and 2.69 respectively. These findings were similar to the study conducted by Charles et al. Different theories have been proposed to know the cause behind

obesity being protective in some obstetric injuries. The main reason being a different composition of the perineal tissue allows more stretching and thus less force and frequency of uterine contractions which cause a decrease in excessive contractions and subsequent pelvic floor injury.⁸

CONCLUSION

Thus, in multiparous patients, over the distended uterus, multiple gestations, prolonged rupture of membranes for >12 hours, and prolonged first and second stage of labor were found to be independently associated with 3rd-degree perineal tears. Baby weights of more than 3 kg were associated with severe perineal injuries, higher-order perineal tears, and vaginal lacerations. It was also seen that, 3rd-degree perineal tears were seen with forceps application, oxytocin augmentation, and a baby weight of more than 3.5 kg.

Limitations

- All the patients were examined in the postpartum period. Hence, antenatal and intrapartum details were recorded according to the history given by patients and documentation maintained by treating doctors. Hence factors such as the position and presentation of a fetus are not well documented.
- Many patients did not follow up in the stipulated time of 7 days post-discharge considered for the purpose of the study.
- No long-term follow-up was possible. Hence, long-term complications such as postpartum urinary or fecal continence issues could not be analyzed.

Clinical Significance

Knowledge regarding risk factors and incidence of lower genital tract injuries in multiparous patients will increase the clinical index of suspicion. Early detection can prevent long-term complications associated with it. This study gives us the insight of injuries in multipara after vaginal delivery in a fully equipped teaching institute with regard to their frequencies, types, severity, and short and long-term complications.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICAL APPROVAL

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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