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Prevalence, Associated Risk Factors and Maternal Outcomes of Lower Genital Tract Injuries in the Bamenda Regional Hospital

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Abstract

BACKGROUND: Tears of the genital tract are lesions resulting from the breakage of the continuity of the lower genital tract during childbirth. These injuries are associated with high maternal morbidity or mortality if severe, poorly managed or delayed in repair. It is a frequent complication of vaginal delivery. This study was aimed at determining the prevalence, demographic characteristics, risk factors, patterns and the t-term maternal outcomes of lower genital tract injuries in the labour room and the post-natal ward of the Bamenda Regional Hospital. **METHODS**: This was a hospital-based cross-sectional study of women managed for genital tract injuries following vaginal birth in the Bamenda Regional Hospital (BRH) from March 2019 to July 2019. A non-probabilistic, consecutive and exhaustive sampling technique was used to select participants (sample size estimated at 237). Among those selected were women who had a vaginal birth. However, the researchers' interest was particularly centered on the women who had genital tract injuries. Data was collected using a pretested questionnaire and analyzed using the SPSS version 22 software. **RESULTS**: In total, 310 participants were included in this study. The mean age of the participants was 26.1 years (SD = 5.2), while the median age was 25 years (interquartile range = 22 - 29). Of the 310 participants included in the study, 128 developed a birth tract injury giving a prevalence of 41.3% (95% CI, 35.8 - 47.0). The most common type of injury was spontaneous tears (33.9%), the majority of which were perineal (30.6%) compared to episiotomies (7.4%). Most perineal tears were first degree tears (23.2%) followed by second-degree tears (6.8%). Third-degree perineal tears were rare (0.6%). We did not have any cases of fourth-degree perineal tears. We also encountered a few cases of cervical tears (0.6%). The factors associated with birth tract injury were assessed using bivariate and mul-

tiple logistic regression analysis. On bivariate analysis, being an adolescent parturient (OR = 2.8, 95% CI: 1.4 - 5.7, p = 0.005), single (OR = 1.78, 95% CI, 1.04 - 3.03, p = 0.034), having a history of birth tract injury (OR = 1.69, 95% CI, 1.01 - 2.95, p = 0.042), a duration of active phase of labour (OR = 2.1, 95% CI, 1.3 - 3.3, p = 0.002), being a primipara (OR = 2.8, 95% CI, 1.0 - 8.4, p = 0.045), inducing labour (OR = 2.4, 95% CI, 1.1 - 5.4, p = 0.033), augmenting labour (OR = 2.4, 95% CI, 1.1 - 5.4, p = 0.033), birthweight of 4000 g or more (OR = 3.0, 95% CI, 1.3 - 7.4, p < 0.015), and foetal head circumference greater than 36 cm (OR = 3.3, 95% CI, 1.5 - 7.9, p = 0.005) were statistically significantly associated with birth tract injuries. The majority of the blood loss post-partum was between 200 and 500 cc. Only one participant had a blood loss of 500 cc and above. Also, the severity of genital pain lasting beyond 24 hours postpartum was mostly less than 5/10 (50.6%) followed by genital pains > 7/10 (41.7%). The prevalence of infection of the injury was (1.6%) and no maternal death from injury was recorded. **CONCLUSION:** The prevalence of lower genital tract injuries in the Bamenda Regional hospital is high. First-degree tears were the most common followed by episiotomies. The perineal outcome in the BRH is poor and should be improved upon.

Keywords

Genital Tract, Episiotomy, Prevalence, Perineum, Cervix, Vagina

1. Introduction

Labour and delivery (childbirth) refer to the set of processes that allow the expulsion of the fetus and its annexes out through the maternal genital tract [1]. Tears (or lacerations) of the genital tract are lesions resulting from breakage of the continuity of the genital tract during birth [2]. Trauma to the genital tract can be secondary to episiotomy, spontaneous obstetric laceration or both [3]. These common injuries include precisely the cervix, vagina, vulva and perineum and are responsible for maternal morbidity and mortality [2] [4]. Human childbirth is seldom completed without the occurrence of at least a slight injury to the birth canal and, sometimes, even deep tearing may occur despite skill and care. Slight abrasions and lacerations of the cervix, vagina, vulva, and perineum are inevitable accompaniments of labour in all primigravidae and most multipara. Various injuries observed during delivery are as under: perineal tears, lacerations of the vagina, tears of the cervix, vaginal and vulva hematomas and rupture of the uterus [5] (uterine rupture is considered a laceration of the upper genital tract).

In the United States, approximately 3.8 million women give birth vaginally each year and most of them experience trauma to the genital tract [6]. 0ver 85% of women having a vaginal birth suffer some perineal trauma. Spontaneous tears requiring suturing are estimated to occur in at least one-third of women in the UK and USA, with anal sphincter tears in 0.5% to 7% of women [7].

In 2015, a study in the Niger state of Nigeria revealed a prevalence of lower

genital tract injuries of 9.1% with the most frequent lower genital tract injury being a first-degree perineal tear at 40.2% [8]. In the literature, few data are available on the risk factors of genital tract trauma in Cameroon. A study carried out in 2009 at the Yaounde Central Hospital revealed that the incidence of perineal tears was 13.5 (76.5% first-degree perineal tears, 22.1% second degree, 1.3% third degree, and no fourth degree was recorded) [9]. Another study done in the same hospital in 2015 showed the prevalence of genital tract lacerations to be 12%. Perineal tears accounted for 92.6% of genital tract lacerations, cervical tears 8.8% and vaginal tears 7.4% [2]. In 2013 the prevalence of perineal tears was found to be 19.2% and that of episiotomy was 2.3% in the Limbe Regional hospital [10]. Although genital tract injuries are this common, their full extent may be underestimated. Reasons for this include incomplete assessment of trauma by birth attendants, underreporting of some types of injury, practice variation in determining which lacerations need to be sutured, and differences in how minor trauma is classified [11].

Genital tract trauma is a common outcome of vaginal birth and can cause short-term and/or long-term problems for the new mother. It can disrupt breastfeeding, family life and sexual relations. 7% - 10% of women continue to have long term pain 3 - 18 months after delivery. It is clear that the effects of perineal trauma can be lasting and in some cases, severe, leading to significant dysfunction and distress for the individual involved. Short term complications of perineal trauma include pain, bleeding and infection, while long term effects include dyspareunia, incontinence of urine (obstetric fistula), flatus or faeces and prolapse. Therefore, effective management is very important in the early postnatal period to minimize the impact of both the acute symptoms and any sustained effect caused by perineal trauma [12]. Primary postpartum haemorrhage is an important complication of lower genital tract injury and a significant contribution to maternal morbidity and mortality [8]. Although serious long-term consequences have been identified for severe perineal lacerations, less attention has been paid to lacerations in other locations and how the risk factors vary for different lacerations [13].

In modern medicine, some risk factors have been identified for cervical lacerations including gestational diabetes, shoulder dystocia, delivery with forceps, vacuum or both, history of cerclage, cervical conization, as well as dilatation and evacuation. [14]. Among various obstetric parameters, primiparity, assisted forceps delivery, persistent occiput posterior position and birth weight of more than 4000 g were previously found to be significantly associated with severe perineal tears. Other, less established, risk factors include maternal age (advancing maternal age [15]); postdate pregnancies, induction of labour a prolonged second stage of labour precipitate labour, epidural anaesthesia and various maternal birth positions. Randomized controlled trials (RCTs) have failed to demonstrate a significant reduction in perineal trauma in women who received an episiotomy compared with women who did not [16]. Instrument assisted vaginal delivery is a significant risk factor for severe perineal lacerations.

Objectives

- To determine the prevalence of lower genital tract injuries in the Bamenda Regional Hospital.
- To identify the risk factors of specific maternal tract injuries.
- To evaluate the short-term maternal outcome of these genital tract injuries.

2. Materials and Methods

2.1. Study Type

This was a hospital-based cross-sectional study.

2.2. Study Setting

Study participants were recruited at the labour room or the post-natal ward of the obstetric and gynecologic unit of the BRH. The O/G unit is a unit that delivers over 3000 women per year. This unit has the following sectors. The outpatient consultation currently controlled by 4 medical doctors (2 obstetric/gynecology specialists and 2 general practitioners), the family planning unit, the antenatal clinic unit, the infant welfare clinic, a postpartum sector (with a capacity of 33 beds), 1 labor and delivery suite (with 6 delivery rooms and a bed capacity of 10 and 13 staff with an average 3 staff per shift working in 12 hourly shifts and an operating theatre). Pregnant women in labour are hospitalized in the labor and delivery room and after delivery they are admitted in the post-natal ward.

2.3. Study Population

2.3.1. Inclusion Criteria

All women who delivered in the BRH were recruited for the study after giving their informed consent to participate in the study.

2.3.2. Exclusion Criteria

- Clients who delivered through a caesarean section.
- Clients who did not give their verbal or written informed consent.

2.4. Sample Size

Using the Cochrane formula

$$n = Z^2 \left[P(1-P) \right] / d^2 ,$$

which is valid where n is the sample size, Z^2 is the abscissa of the normal curve that cuts off an area α at the tail ($1 - \alpha$ equals the desired confidence level, e.g, 95%), d is the desired level of precision at 5%, P is the estimated proportion of an attribute that is present in the population. In this study, we used 19%, a pre-study estimate of the prevalence of perineal tears after vaginal birth in the Limbe Regional Hospital [11]. The value of Z is found in statistical tables which contain the area under the normal curve. In this case, Z is 1.96

$$n = \frac{(1.96)^2 (0.19)(0.81)}{(0.05)^2} = 237$$

2.5. Sampling Technique

A consecutive sampling technique was used in this study.

2.6. Duration

The study was carried out from March 2019 to July 2019.

2.7. Site

Study participants were recruited in the labour room or the post-natal ward of the Obstetric and Gynecologic Unit of the Bamenda Regional Hospital, BRH. The BRH is a third referral hospital situated in the Bamenda II Municipality in the North West Region of Cameroon.

The O/G unit has the following sectors; the outpatient consultations currently controlled by 4 medical doctors, 2 O/G specialists and 2 general practitioners, the family planning unit, the antenatal clinic unit, a postpartum sector (with a capacity of 33 beds), 1 labour ward (with 6 delivery rooms and a bed capacity of 10 and 13 staff with an average 3 staff per shift working in 12 hourly shifts and an operating theatre).

Pregnant women in labour are hospitalized in the labour room and after delivery (either through vaginal delivery or C/S) they are admitted to the post-natal ward.

2.8. Ethical Considerations

2.8.1. Ethical Clearance

The protocol, the questionnaires and the informed consent form were submitted to the Institutional Ethical Review Board (IERB) of the Faculty of Health Sciences of the University of Bamenda for ethical evaluation and approval.

2.8.2. Administrative Authorization

Authorizations from the Regional Delegate of Public Health and the Director of the Bamenda Regional Hospital were obtained. The questionnaires were coded with the participants being identified by their phone numbers only.

2.8.3. Informed Consent

Each participant was briefed on the aim, the methods, risks and benefits associated with this study and they had the opportunity to ask questions on the research. They willingly decided to participate in this research without any form of pressure and they filled and signed the informed consent form given.

3. Results

3.1. Description of the Study Population

In total, 310 participants were included in this study. The mean age of the participants was 26.1 years (SD = 5.2), while the median age was 25 years (interquartile range = 22 - 29). The age distribution of our study participants is displayed in Figure 1. The ages of the participants ranged from 16 to 42 years.

Table 1 depicts the sociodemographic and obstetric characteristics of the

study participants.

The majority of the participants were between 21 and 30 years of age (68.4%), resided in urban areas (64.2%), had at least a secondary education (57.1%), had informal jobs [subsistence farming and casual work] (40.0%) and were married (77.1%). The occupation of our study participants is displayed in Figure 2.

Table 1. Sociodemographic characteristics of the study population.

Variables	Frequency	Percentage
Age group in years		
Up to 20	38	12.3
21 to 30	212	68.4
31 and above	60	19.4
Residence		
Urban	199	64.2
Rural	111	35.8
Level of education		
No formal education	1	0.3
Primary	33	10.6
Secondary	177	57.1
Tertiary	99	31.9
Occupation		
Student	42	13.5
Trader	49	15.8
Housewife	46	14.8
Informal sector	124	40.0
Public sector	49	15.8
Marital Status		
Married	239	77.1
Single	71	22.9
Term		
Preterm	20	6.9
Term	265	91.7
Post-term	4	1.4
Parity, Median (IQR)	3 (2 - 4)	
Gravidity, median (IQR)	3 (2 - 4)	
Attended Antenatal clinic		
Yes	310	100.0
No	0	0.0
Term of the booking visit		
First trimester	159	54.5
After the first trimester	133	45.5

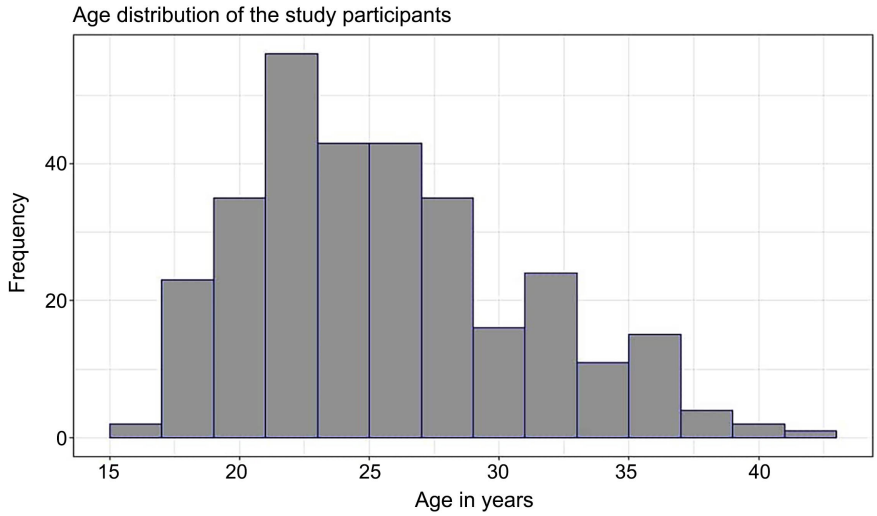

Figure 1. Age distribution of our study population.

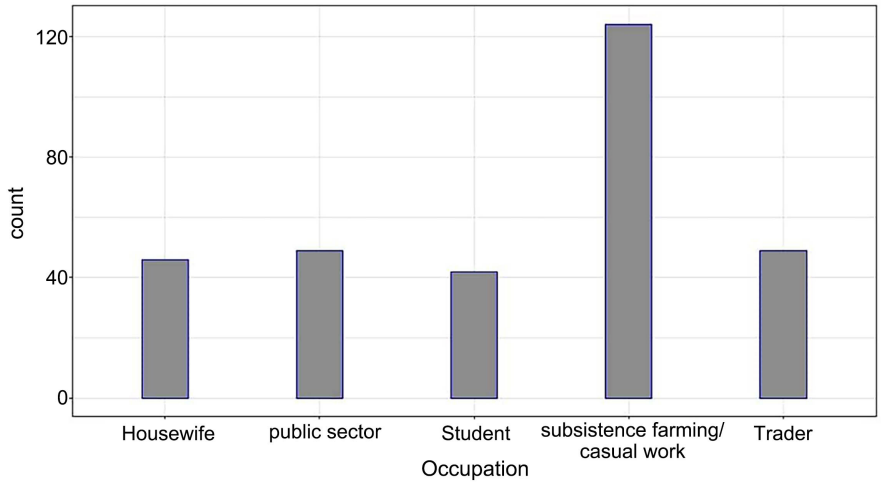

Figure 2. Distribution of the occupation of our study participants.

3.2. Prevalence of Birth Tract Injuries

Of the 310 participants included in the study, 128 developed a lower genital tract injury giving a prevalence of 41.3% (95% CI, 35.8 - 47.0). The most common type of injury was spontaneous tears (33.9%), the majority of which were perineal (30.6%), Table 2. Most perineal tears were first-degree tear. Third-degree perineal tears were rare and we did not have any cases of fourth degree perineal tears, Table 2.

3.3. Factors Associated with Perineal Tears

In Table 3, the factors associated with birth tract injury were assessed using bivariate and multiple logistic regression analysis. On bivariate analysis, being an adolescent parturient (OR = 2.8, 95% CI: 1.4 - 5.7, p = 0.005), single (OR = 1.78, 95% CI, 1.04 - 3.03, p = 0.034), having a history of birth tract injury (OR = 1.69, 95% CI, 1.01 - 2.95, p = 0.042), a duration of active phase of labour (OR = 2.1,

95% CI, 1.3 - 3.3, p = 0.002), being a primipara (OR = 2.8, 95% CI, 1.0 - 8.4, p = 0.045), inducing labour (OR = 2.4, 95% CI, 1.1 - 5.4, p = 0.033), augmenting labour (OR = 2.4, 95% CI, 1.1 - 5.4, p = 0.033), birthweight of 4000 g or more (OR = 3.0, 95% CI, 1.3 - 7.4, p < 0.015), and foetal head circumference greater than 36 cm (OR = 3.3, 95% CI, 1.5 - 7.9, p = 0.005) were statistically significantly associated with birth tract injuries.

After bivariate logistic regression analysis, the backward elimination method was used to select variables for inclusion in the final multiple regression model based on the Akaike Information Criterion (AIC); which is a measure of the quality of the statistical model. Only variables with p values below 0.1 on bivariate logistic regression were assessed for inclusion in the final model. The final model sort to identify factors independently associated with birth tract injuries by eliminating confounders. After backward elimination, the following were identified to be non-contributory to the quality of the final model and were therefore dropped from the final model: Marital status, duration of the active phase, induction of labour, augmentation of labour, birth weight and head circumference.

On multiple logistic regression analysis, adolescence (aOR = 6.0, 95% CI, 1.2 - 32.9, p < 0.027), history of birth tract injuries (aOR = 5.8, 95% CI, 2.9 - 11.8, p < 0.001), and primiparity (aOR = 4.4, 95% CI, 1.3 - 14.8, p = 0.014) independently predicted up to 49.1% (Nagelkerke Pseudo R^2 value) of the variability in the occurrence of birth tract injuries. A non-significant Hosmer-Leme show test attested to a good fit between our model and data.

Table 2. Location/type and degrees of the genital tract tears.

Variables	Frequency (N = 310)	Prevalence (95% CI)
Location of the genital tract tear		
Spontaneous tears	105	33.9% (28.7 - 39.5)
Perineal	95	30.6% (25.6 - 36.2)
Vaginal	8	2.6% (1.2 - 5.2)
Cervical	2	0.6% (0.1 - 2.5)
Episiotomy	23	7.4% (4.9 - 11.1)
Mediolateral	22	7.1% (4.6 - 1.7)
Midline	1	0.3% (0.01 - 2.1)
Degrees of perineal tears		
First degree	72	23.2% (18.7 - 28.4)
Second degree	21	6.8% (4.3 - 10.3)
Third-degree	2	0.6% (4.3 - 10.3)
Fourth degree	0	0.0%

Table 3. Factors associated with birth track injuries on bivariate analysis and multiple logistic regression analysis in the Bamenda Regional Hospital.

Variables	Birth tract injury					
	Yes, n = (%)	No, n = (%)	OR (95%CI)	p value	aOR (95%CI)	p value
Maternal age&						
Adolescent (<20 years)	24 (18.8)	14 (7.7)	2.8 (1.4 - 5.7)	0.005*	6.0 (1.2 - 32.9)	0.027
Adult (≥20 years)	104 (81.2)	168 (92.3)	Ref			
Residence						
Rural	47 (36.7)	64 (35.2)	0.9 (0.6 - 1.5)	0.779		
Urban	81 (63.3)	118 (64.8)	Ref			
Level of education						
At most primary	10 (7.8)	24 (13.2)	Ref			
Secondary	79 (61.7)	98 (53.8)	1.9 (0.9 - 4.5)	0.104		
Tertiary	39 (30.5)	60 (33.0)	1.6 (0.7 - 3.7)	0.300		
Marital status&						
Single	37 (28.9)	34 (18.7)	1.78 (1.04 - 3.03)	0.034*	Ex	
Married	91 (71.1)	148 (81.3)	Ref			
Employment status						
Unemployed	38 (29.7)	50 (27.5)	Ref			
Employed	18 (14.1)	31 (17.0)	0.8 (0.4 - 1.6)	0.462		
Self-employed	72 (56.2)	101 (55.5)	0.9 (0.6 - 1.6)	0.809		
History of birth tract injury&						
Yes	33 (25.8)	31 (17.0)	1.69 (1.01 - 2.95)	0.042*	5.8 (2.9 - 11.8)	<0.001
No	95 (74.2)	151 (83.0)	Ref			
Duration of active phase&						
≤6 hours	53 (42.4)	106 (60.2)	Ref			
>6 hours	72 (57.6)	70 (39.8)	2.1 (1.3 - 3.3)	0.002*	Ex	
Parity&						
Primipara	7 (12.3)	7 (4.8)	2.8 (1.0 - 8.4)	0.045*	4.4 (1.3 - 14.8)	0.014
Multipara	50 (87.7)	138 (95.2)	Ref			
Induction of labour&						
Yes	17 (13.3)	11 (6.0)	2.4 (1.1 - 5.4)	0.033*	Ex	
No	111 (86.7)	171 (94.0)				
Augmentation of labour &						
Yes	35 (27.6)	25 (13.9)	2.4 (1.3 - 4.2)	0.003*	Ex	
No	92 (72.4)	155 (86.1)				
Instrumental delivery						
Yes	11 (8.7)	0 (0.0)	Undefined			
No	116 (91.3)	181 (100.0)				

Continued

Gender					
Male	60 (46.9)	84 (46.2)	1.0 (0.7 - 1.6)	0.900	
Female	68 (53.1)	98 (53.8)			
Type of delivery					
Single gestation	126 (98.4)	180 (98.9)	1.4 (0.2 - 12.0)	0.723	
Multiple gestations	2 (1.6)	2 (1.1)			
Fetal position					
Occipital-anterior	106 (96.4)	163 (98.8)	3.1 (0.6 - 22.5)	0.199	
Occipital-posterior	4 (3.6)	2 (1.2)			
Fetal presentation					
Cephalic	125 (97.7)	179 (98.4)	0.7 (0.1 - 3.8)	0.663	
Breech	2 (2.3)	3 (1.6)	Ref		
Birthweight (in g)[&]					
<3500	68 (53.1)	121 (66.5)	Ref		
3500 - 3990	45 (35.2)	52 (28.6)	1.5 (0.9 - 2.5)	0.089	Ex
≥4000	15 (11.7)	9 (4.9)	3.0 (1.3 - 7.4)	0.015*	Ex
Head circumference[&]					
≤36 cm	107 (84.9)	168 (94.9)	Ref		
>36 cm	19 (15.1)	9 (5.1)	3.3 (1.5 - 7.9)	0.005*	Ex

OR = Odds ratio**; aOR** = adjusted odds ratio; **CI** = confidence interval; *Significant p-value [&]Considered for inclusion in the final multiple regression model. **Ex** = Excluded by backward elimination before the final multiple regression model. **McFadden PseudoR^2** = 49.1%. **Hosmer-Lemeshow test:** p value = 1.

3.4. Distribution of Maternal Morbidity and Mortality

Table 4 shows the distribution of maternal morbidity and mortality according to the presence or absence of genital tract injury. Majority of the blood loss was between 200 and below 500 cc. Only one participant had blood loss of 500 cc or over. Also, the severity of genital pain lasting beyond

24 hours postpartum was mostly less than 5/10 (50.6%) followed by genital pains > 7/10 (41.7%). The prevalence of infection of the injury was (1.6%) and no maternal death from injury was recorded.

4. Discussion

This study sought to determine the prevalence and associated risk factors of lower genital tract injuries among vaginal deliveries as well as evaluating the short-term maternal outcomes of these injuries.

Our study revealed the prevalence of lower genital tract tears to be 43.1% with majority of the tears being perineal tears (33.9%) and adolescence (aOR = 6.0, 95% CI, 1.2 - 32.9, p < 0.027), primiparity (aOR = 4.4, 95% CI, 1.3 - 14.8, p = 0.014) and a history of birth tract trauma (aOR = 5.8, 95% CI, 2.9 - 11.8, p < 0.001), independently associated with birth tract injuries. Genital pain was found to be the main morbidity with birth tract injuries occurring in 86.2% of cases.

Table 4. Distribution of maternal morbidity and mortality in birth tract injuries.

Morbidity and mortality	Total (%)	Birth tract injury	
		Yes, n = (%)	**No,** n = (%)
Postpartum bleeding in cc			
<200	77 (25.5)	22 (17.3)	55 (31.4)
200 to <500	224 (74.2)	105 (82.7)	119 (68.0)
500 or above	1 (0.3)	0 (0.0)	1 (0.6)
Severity of genital pain beyond 24 hours post-partum			
<5/10	85 (50.6)	34 (30.6)	51 (89.5)
5/10 to 7/10	13 (7.7)	13 (11.7)	0 (0.0)
>7/10	70 (41.7)	64 (57.7)	6 (10.5)
Infection of injury			
Yes	2 (0.6)	2 (1.6)	0 (0.0)
No	308 (99.4)	126 (98.4)	182 (100.0)
Death			
Yes	1 (0.3)	0 (0.0)	1 (0.5)
No	309 (99.7)	128 (100.0)	181 (99.5)

These results will raise awareness among health professionals on the use of preventive measures during delivery of women with risk factors and ensure immediate and proper management of women with injuries in order to prevent the immediate and long term morbidities associated with these injuries.

4.1. Socio-Demographic Characteristics

In total, 310 participants were included in this study. The mean age of the participants was 26.1 years (SD = 5.2), while the median age was 25 years (interquartile range = 22 - 29). The results are similar to those of Fouelifac and collaborators in 2015 at the Yaounde Central hospital [1] where they found a mean age of 26.12 ± 5.83 in a series 1250 patients. These figures were also similar to those of Egbe and others (26.2) in a retrospective study in 2012 at the Limbe Regional hospital [11]. The results are slightly lower than those obtained by Lesley and others in 2013 in the UK [16] where they placed the mean age of nulliparous women at 29.1 and that of multiparous women at 31.7.

The results in our study can be explained by the high sexual activity of women in their twenties. The higher mean ages in the study by Lesley and collaborators can be explained by the fact that the UK is a high-income economy where most women are more career-oriented and so turn to childbearing much later in life than women in our setting.

The majority of the participants resided in urban areas (64.2%), had at most a secondary education (57.1%), had informal jobs [subsistence farming and casual

work] (40.0%) and were married (77.1%). The findings from this study revealed that parturient suffered genital trauma irrespective of residence, level of education or occupation. Being single (OR = 1.78, 95% CI, 1.04 - 3.03, p = 0.034) was statistically significantly associated with birth tract injuries. Majority of the single women in the study were primates who have a reduced elasticity of the pelvic floor.

4.2. Prevalence of Lower Genital Tract Injuries

Of the 310 participants included in the study, 128 developed a birth tract injury giving a prevalence of 41.3% (95% CI, 35.8 - 47.0). This figure is higher than that obtained in the Yaounde teaching hospital (Cameroon) (13.5%) [10] and higher than that obtained in the Niger Delta state of Nigeria (9.1%) [6]. The studies in Yaounde and in Nigeria were retrospective studies with suspected underreporting of cases of birth tract injuries by birth attendants. The study in Yaounde included only perineal tears.

The prevalence of spontaneous perineal tear in this study was found to be 33.9% and that of episiotomy was 7.4%. Of the spontaneous perineal tears, first-degree tears were the most common (23.2%), followed by second-degree tears (6.8%) and third-degree tears (0.6%). We did not have any fourth-degree tears. The prevalence of episiotomy was higher than 2.3% reported by Egbe and collaborators [11] at the Limbe Regional Hospital (Cameroon) and lower than 22% (91/410) reported in Tansen Mission Hospital in Nepal in 2009 [17]. Current evidence supports restrictive use of episiotomy [18] and explains the high prevalence of perineal tears in our setting.

The overall prevalence of first, second and third degree tears was lower than that obtained in the study carried out in 2009 in Nepal, which reported a prevalence 55.4%, 43.2%, and 1.4% for first, second and third-degree perineal tears, respectively [17].

The prevalence of third and fourth-degree perineal tears was similar to the results obtained by Nkwabong in the University Teaching Hospital in Yaounde (Cameroon) [10] where they reported an incidence of 1.3% third-degree perineal tears and no fourth-degree tear. A prevalence of 0.22% third-degree perineal tears and no fourth-degree tear was also reported at the Limbe Regional Hospital (Cameroon) [11]. The rate of third-degree perineal tear in our study was lower than that obtained in a study carried out in San Francisco, Califonia in 2003 (4.4%) [19]. This study had a larger sample size than our study.

Vaginal and cervical tears represented 2.6% and 0.6% of lower genital tract lacerations respectively. The prevalence of cervical tears is similar to that obtained by Fouelifac and others (0.7%) in the Yaounde Central Hospital [1]. They obtained a higher prevalence (6.6%) of vaginal lacerations. Njoku and collaborators in the Niger Delta state of Nigeria [6] obtained 8.2% and 11.9% vaginal and cervical tears respectively, which are higher figures than those in our study. This study had a large sample size of 15,526 participants as compared to ours.

4.3. Factors Associated with Lower Genital Tract Lacerations

In our study a number of known factors of genital trauma were found to be statistically significant. These included adolescent age, primiparity, history of genital tract trauma, a duration of active labor greater than 6 hours, augmentation and induction of labour, fetal head circumference of greater than 36 cm and birth weight of greater than or equal to 4000 g. These results were similar to those obtained in Yaounde in a case-control study [1] where they observed the following; A history of birth canal tear was significantly more frequent in cases than in controls, augmentation of labor, birth weight of greater than or equal to 4000 g increased the risk of tearing of the birth canal.

These results can be explained by the fact that a perineal scar of the previous perineal trauma might reduce the strength of the pelvic floor muscle and increase rigidity. Bick D and collaborators [18] reported that women who experience perineal tears during the first delivery are more than 3 times more likely to sustain trauma at birth of their second baby.

Oxytocin increases the pressure in the perineum thereby favouring the occurrence of tears [19]-[24].

Egbe and others found primiparity to be statistically significant for perineal injury. This is similar to the findings in our study. They noted a maternal age (25 - 40) to be associated with genital injury. Mohamed and others [5] also showed that women with older age groups and para 4 and above were significantly more likely to have perineal trauma. These differ from our findings where we noted that adolescence was statistically significant. Sheiner and collaborators reported that younger maternal age and primiparity were considered risk factors of perineal trauma during childbirth and therefore deserve special attention. Primiparity as a risk factor for perineal tear can be explained by the reduced elasticity of the pelvic floor in parturient who had never given birth. Persistent occipito-occipito posterior position, instrumental delivery, short perineal length of < 4 cm, duration of second stage > 30 minutes, and shoulder dystocia are associated factors reported by other studies [1] [5] [13] [22]

4.4. Maternal Morbidity and Mortality

The severity of genital pain in the immediate postpartum period was mostly less than 5/10 (50.6%) followed by genital pains > 7/10 (41.7%). Of the evaluated women, 54.1% reported pain. Among the respondents with pain, 86.1% had suffered a genital injury. These figures are lower than those reported by Mathias and collaborators [2] where 91% of respondents with pain in the immediate postpartum period had suffered some form of perineal trauma. This could be explained by the fact that the studies were carried out in different settings with different attitudes towards the use of analgesics in postpartum, suture materials used and suture techniques.

We did not have any case of postpartum haemorrhage as a result of genital laceration. Our results differ from those of a study carried out in the Bonassama

district hospital in Douala (Cameroon) [16] where obstetric lacerations were the primary cause of PPH in 37.7% of cases. This discrepancy is probably as a result of the different methods used in the estimation of blood loss after delivery. A measuring cylinder was used to quantify blood loss in the study in Bonassama while we used values from the birth records which are estimates of the actual blood loss reported by the attending midwife.

There was no case of infection from the injury and no maternal death from injury was recorded. Our results also differ from those of Njoku and collaborators [6] whereby they recorded 11.6% genital tract infections and a 0.68% death rate. This was a retrospective study with large sample size and included referral cases with complications from peripheral health facilities. They also noted 0.15% vesicovaginal and 0.23% rectovaginal fistulas which are long term complications of genital tract injuries during delivery [25] [26].

Therefore, effective management is very important in the early postnatal period so as to minimize the impact of both the acute symptoms and any sustained effect caused by genital trauma.

4.5. Limitations

1) The study was carried out in only one health facility in the Bamenda Municipality. The results obtained cannot therefore be generalized to the whole municipality.

2) The procedure of the study was invasive with examination of the pelvic region of the clients. Some clients refused their informed consent especial in the postnatal ward because of the invasive nature of the study.

3) Clients were admitted for a maximum of 48 hours post partum. 48 hours is shorter than the incubation period of most infections. This probably influenced the prevalence (0.0%) of infections recorded in this study.

4) Amount of blood loss was gotten from maternal records which was an estimate of actual blood loss reported by the attending midwife. This probably underestimated the amount of blood loss.

5. Conclusions

This study revealed that:

1) The prevalence of spontaneous lower genital tract injuries among vaginal deliveries in the Bamenda Regional Hospital was high (33.9%). Obstetric anal sphincter injuries were 0.6% of all vaginal deliveries.

2) 86.1% of patients with genital injury complained of genital pain in the immediate postpartum period and no case of infection and mortality was recorded as a result of birth tract injury.

3) The factors associated with lower genital tract injuries were: adolescence, past history of birth tract injury, a duration of active phase of labour > 6 hours, primiparity, induction and/or augmentation of labour, birth weight of 4000 g or more and foetal head circumference greater than 36 cm. Preventive measures

should be used for parturient presenting with the above factors.

4) Competence in the prevention of birth tract injuries by the health professionals in the BRH is poor while competence in the prompt and effective management of these injuries is good.

Third-degree perineal tears were rare and we did not have any cases of fourth-degree perineal tear. Marital status, duration of the active phase, induction of labour, augmentation of labour, birth weight and head circumference were found to be contributory factors.

Recommendations

- Early Antenatal Clinic;
- Adequate monitoring of labour;
- Proper perineal support;
- Adequate midwifery techniques during delivery.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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