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Outcomes of Twin Delivery at the Bamenda Health District, North West Region Cameroon

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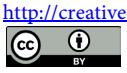

Abstract

Introduction: Multiple gestations or multiple pregnancies occur when two or more fetuses are conceived at the same time in the same woman. Therefore, a twin pregnancy is defined as the simultaneous development of two fetuses in the same woman. It can either be a monozygotic or dizygotic pregnancy. Twin pregnancy is considered a high-risk pregnancy with variable incidence and outcomes worldwide. The adverse maternal and fetal outcomes of twin deliveries have not yet been investigated in our setting. **Objectives:** The main objective of this study was to evaluate the outcomes of twin deliveries at the Bamenda Health District. **Methods**: This was a hospital-based, cross-sectional analytic study done at the Bamenda Health District in three selected hospitals (Bamenda Regional Hospital, CMA Nkwen, and IHC Azire) from the 1st of January to the 10th of May 2018. 55 women with twin pregnancies and 55 women with singleton pregnancies at gestational ages of 28 completed weeks and above who came for delivery and who consented to the study were included. A face-to-face interview-administered questionnaire was used to obtain sociodemographic characteristics; a venous blood sample was collected from the mothers before and after delivery to determine the estimated blood loss based on haemoglobin level. The partogram was opened from 4 cm cervical dilatation for those who came in the first stage of labour and the mode of delivery was recorded. After delivery, outcome variables were 1st, 5th, and 10th min Apgar score, birth weight, and gestational age. Data were entered in CSPro 7.1 and exported to IBM SPSS version 23.0 for analysis. All variables with $p < 0.05$ were statistically significant, OR and 95% CI were calculated for

all outcome variables to measure the association with twin deliveries. **Results:** During the study period, we included 110 participants (55 twin mothers and 55 singleton mothers). Women with twin gestations were mostly aged between 25 and 34 years with a mean maternal age of 28.6 ± 5.8 years, more than half (60%) of them were multiparous with family histories of twin, and business was their main occupation (58.2%). The prevalence of twin gestations at the Bamenda Health District was 2.8%. As compared to singleton deliveries, twin deliveries were associated with adverse fetal outcomes such as prematurity (born before 37 completed weeks) which was about 6 times higher among twins than singleton babies (OR: 5.6, 95% CI: 2.2 - 14.3, $p < 0.001$), birth asphyxia (Apgar score < 7 at 5th min) that was 15 times higher in twin than singleton births (OR: 15.3, 95% CI: 2 - 116.6, $p < 0.001$) and low birth weight (birth weight < 2500 grams) that was 15.6 times increased in twin than singleton births (OR: 15.6, 95% CI: 3.6 - 67.8, $p < 0.001$). There were 5.5 times increased cesarean sections among women with twin pregnancies compared to women with singleton pregnancies (OR: 5.5, 95% CI: 2.2 - 13.9, $p < 0.001$). There was no association between twin delivery and postpartum haemorrhage ($p > 0.05$). **Conclusion:** Twin deliveries were associated with adverse fetal outcomes (prematurity, birth asphyxia, and low birth weight) in the three health facilities where we carried out the study. Cesarean section was higher among women with twin gestations compared to women with singleton gestations.

Keywords

Outcomes, Twin, Singleton, Pregnancies, Deliveries, Bamenda, Health, District

1. Introduction

Multiple gestations or multiple pregnancies occur when two or more fetuses are conceived at the same time in the same woman. It can either be a monozygotic or dizygotic twin. Twin pregnancy is considered a high-risk pregnancy with variable incidence worldwide [1].

Globally, the highest burden of multiple births has been found in sub-Saharan Africa, with an average twinning rate of 20 per 1000 deliveries compared to 10 per 1000 deliveries in Europe or around 5 - 6 per 1000 births in Asia [2]. Japan has the lowest incidence of 4/1000, whereas African countries have a higher incidence of twins, with up to 54/1000 births reported from Nigeria [2] [3]. In Cameroon, the twinning rate of 1.8 per 100 deliveries was reported in a study done at Yaoundé Teaching Hospital in 1998 [4]. In the past two decades, the prevalence of multiple pregnancies has increased in industrialized and developing countries [5]. The dizygotic twin pregnancy rate varies around the world and is significantly associated with numerous factors including race, maternal age, genetics, parity, and the use of Assisted Reproductive Technology (ART) [6].

The world health organization (WHO) estimates that 99% of the 287,000 annual maternal deaths and 3 million neonatal deaths worldwide occur in developing countries [7].

In Cameroon in 2014, a study done on neonatal mortality in a referral hospital over 7 years showed that neonatal death was 10% with the major causes being: prematurity (31.36%); birth asphyxia (16%); low birth weight [8]. There is extensive evidence that twin births worldwide are associated with a substantially higher risk of maternal and perinatal mortality and morbidity compared to singleton births [9]. Multiple pregnancies are associated with a 4-fold increase in fetal death and a 6-fold increase in neonatal death [10]. In 2017 in India, the maternal outcomes of twin pregnancies included: anaemia (41.9%), preterm labour (35.97%), hypertension (30%), premature rupture of membrane (23.88%), and postpartum haemorrhage (11.94%) [11]. The same study reported that prematurity, low birth weight (LBW), and birth asphyxia were the common neonatal outcomes [11]. A study done to determine the incidence and perinatal outcome of twins in a Nigerian mission hospital in 2011 showed that birth asphyxia, LBW, preterm delivery, and caesarean section (CS) were significantly higher in twins compared to singleton pregnancies [12]. It has long been recognized that the delivery of twins constitutes an area of significant risk in Obstetrics. A study done in 2017 in Korea to compare perinatal outcomes in late preterm birth between singleton and twin pregnancies reported a higher rate of caesarean section in the twin group compared to the singleton group (91.1% vs 57.8%) [13]. Another study done in Nigeria tertiary hospital showed that the risk of delivering a twin gestation by caesarean section was 3 times that of a singleton pregnancy [14]. The rate of CS in the delivery of twin pregnancies was statistically higher than that in singleton pregnancies (42% vs 20%) [14].

1.1. Statement of Problem

It is known that twin pregnancy is a high-risk pregnancy worldwide, but very little is known about the exact situation of the phenomenon at the BHD of the Mezam division of the Northwest region.

One cannot state with certainty whether women with twin pregnancies are more likely to have adverse maternal and fetal outcomes compared to women who have singleton pregnancies. Also, the prevalence of twin gestation is not known in this area.

1.2. Objectives

1) Describe the sociodemographic characteristics of women with twin gestations at the BHD.

2) Determine the prevalence of twin gestations at the BHD.

3) Identify maternal and fetal outcomes of twin deliveries at the BHD.

4) Compare, the fetal and maternal outcomes of twins with those of singleton deliveries at the BHD.

2. Materials and Methods

2.1. Study Design

This was a hospital-based cross-sectional analytic study.

2.2. Study Site

This study was carried out at the BHD which is one of the 19 Health Districts in the North West Region of Cameroon. It is located at the heart of the North West Regional Head Quarter. The BHD is an urban and semi-urban area with one main hospital (Bamenda Regional Hospital or BRH) that functions as a referral hospital. With a population of about 360,523 inhabitants, the BHD is comprised of 17 Health Areas (14 public and 3 conventional) and covers a total surface area of 560 kilometres square. The study was therefore carried out in 3 health facilities within the BHD (BRH, CMA Nkwen, and Integrated Health Centre Azire) selected by balloting.

The Bamenda regional hospital (BRH) is a secondary health care centre found in the Mankon Health area, Nitop II quarter. It is made up of an imagery centre; medical laboratory; International Tuberculosis Laboratory; two pharmacies; Internal medicine; surgical; pediatric and obstetrical/gynaecological services. The latter service comprises a gynaecological and maternity unit with an antenatal care unit, a labour and delivery room which has (1 nursing station, 3 delivery rooms with 8 beds, 1 theatre) and a postnatal ward. The neonatology unit is attached to the labour room under a paediatrician. The obstetric and gynaecological service is run by three obstetricians and gynaecologists aided in the labour room by 12 midwives and one nurse. Medical and nursing students are also part of the team since BRH serves as a teaching hospital of the Faculty of Health Sciences/ University of Bamenda (FHS/UBa). They Work in two shifts (day and night shifts) every day with a minimum of 2 workers per shift and conduct more deliveries (3600/year) on average than other health facilities in the Region. Cesarean section is being performed by obstetrician/Gynaecologists. Parturient women come mostly from the Northwest Region.

CMA Nkwen is found in Nkwen Urban Health Area, it is a primary health care centre that comprises the following services: casualty, medical ward, family planning, infant welfare clinic, diabetic unit, laboratory, pediatric ward, and maternity ward made up of: one labour room with 4 beds, one delivery room with 3 delivery beds and one theatre well equipped used only for CS cases. The maternity ward is run by 1 general practitioner aided by 9 midwives and 5 nurses. They work in 2 shifts and conduct about 1700 deliveries yearly. CS is being done by the general practitioner of the centre. The post-natal word is immediately attached to the labour room. Complicated cases are being referred to the BRH for better management.

The Integrated Health Centre (IHC) Azire is found in Mankon Health Area, found in the Nitop II quarter. It is made up of a laboratory, pharmacy, general consultation, minor surgery infant welfare (IWC), antennal care (ANC), and

maternity units. The latter unit comprises (1 nursing station, 1 delivery room, with 2 delivery beds, 2 postnatal rooms), and 5 midwives working in 2 shifts. They performed about 600 deliveries/year. All complicated cases are being referred to the Regional Hospital Bamenda.

2.3. Study Duration

This was a 4 months study conducted from the 1st of January 2018 to the 10th of May 2018.

2.4. Study Population

Two groups of women were involved in this study: women with twin pregnancies and women with singleton pregnancies coming to deliver at the labour room of each of the three selected health facilities at the BHD (maternity of BRH, maternity of CMA Nkwen, and maternity of IHC Azire) during the study period.

2.5. Sampling Method

Eligible participants were enrolled using a consecutive non-probabilistic sampling method.

Sample Size Calculation

To achieve the main sample size, we utilized the following formula:

$$N = \frac{2\times\left(Z_{\alpha}+Z_{\beta}\right)^{2}\times P\times\left(1-P\right)}{\left(P_{0}-P_{1}\right)^{2}}$$

where:

N = minimal sample size.

The values for P_1 and P_0 were extracted from the study done on twin versus singleton pregnancies: the incidence, pregnancy complications, and obstetric outcomes in a Nigerian tertiary hospital in 2011 [14].

P_1 = proportion of women with twin pregnancies who were delivered by CS (P_1 = 42%).

P_0 = proportion of women with singleton pregnancies who were delivered by CS (P_0 = 20%) $P = P_1 + P_0$ = measure of variability 2 α = type I error = 5% with Confidence interval of 95% (α = 0.05).

Z_{α} = 1.96 β = type II error = 10%

Z_{β} = 1.28

$$N = \frac{\left(1.96+1.28\right)^{2}\times 0.31\times\left(1-0.31\right)}{\left(0.42-0.20\right)^{2}} = 55.13 = 55$$

Our minimal sample size was 55 women with twin gestations in the risk group and 55 women with singleton gestations in the non-risk group, given a total of 110 participants.

2.6. Study Procedure

After obtaining ethical clearance to carry out the study from the ethical Institu-

tional Review Board of the University of Bamenda and the administrative authorization from the administrative head of each centre, the potential participants were approached by the principal investigator once they arrived at the labour room during the study period. Eligible parturients were invited verbally and the information notice about the study was explained to those who could read and write. For those who could not read or write, the information was explained to their caretakers. Eligible participants were then tested for exclusion criteria after which they were given enough time to express their worries and clarify their doubts before giving a written consent form. Only those who were eligible and who gave their consent were enrolled in the study. Each parturient with a twin pregnancy who met the inclusion criteria as well as the following parturient with a singleton pregnancy (1:1) was interviewed by the principal investigator using a face to face interviewer-administered questionnaire to determine sociodemographic characteristics (maternal age, parity, gravidity, date of the last menstrual period, number of antenatal consultations, type of pregnancy, marital status, level of education, family history of twin).

The participants were followed throughout labour using the partogram open at 4 cm cervical dilatation for those who came at the first stage of labour to determine the mode of delivery (normal vaginal delivery or caesarean section).

After delivery, babies and their mothers were assessed for the following variables:

- **Newborn:**

Apgar score: determined at first, fifth, and tenth minutes using the Apgar scoring system.

Gestational age: at the time of delivery was determined by the maternal last menstrual period (LMP) or from the first-trimester echography result for those who did not know their LMP.

Birth weight: an infant scale (RZT20), was used to measure infant birth weight to the nearest gram within the first hour after birth.

Maternal outcomes:

Postpartum haemorrhage (PPH): a blood sample was collected from the mother before and after delivery to assess the haemoglobinbinn level using disposable gloves, gauze pads, a dry swab, 5 mls syringe, tourniquet, and a glass tube with a screw cap or EDTA tube. This was analyzed in the hospital laboratory using "NUVE HCT CENTRIFUGE, NF04/8, HEM/E/32/146". The estimated blood loss was then determined from the Hb change as follows: 1 g/dl HB = 500 ml of blood.

- X (g/dl) HB = (Haemoglobin before delivery – haemoglobin after delivery) = estimated blood loss (ml) Estimated blood loss (ml) = 500 ml × X (g/dl)

Data on the total number of delivery during the study period (4 months) was collected from the hospital record book to calculate the prevalence of twin pregnancies at the three selected hospitals of the BHD.

3. Results

There were a total of 1991 deliveries with gestational ages of 28 completed weeks

and above during the study period out of which 56 were twin deliveries. One participant was excluded and we finally analyzed data collected from 55 women with twin pregnancies and 55 women with singleton pregnancies and their babies out of 1990 deliveries (Figure 1).

3.1. Age Distribution of Participants

The mean maternal age of participants with twin pregnancies was 28.6 ± 5.8 years. The age groups 25 - 29 years and 30 - 34 years were most represented (32.7%) each; meanwhile <20 years and above 40 years were least represented (3.6%) (Figure 2).

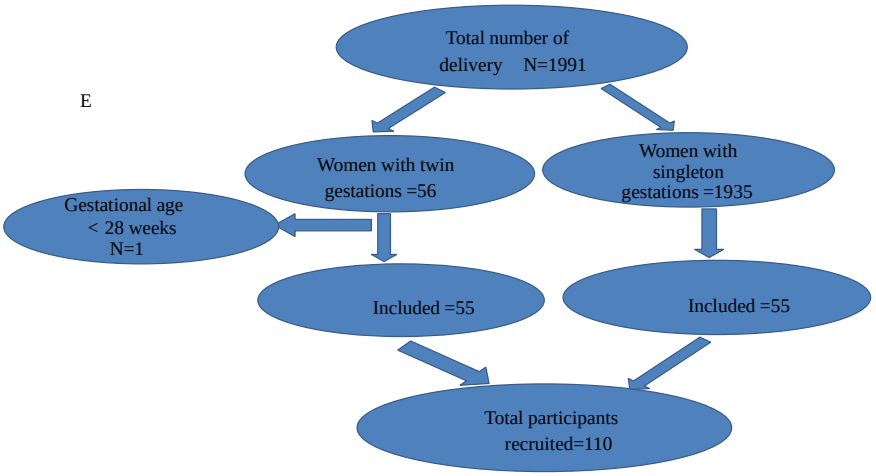

Figure 1. Sociodemographic characteristics of women with twin pregnancies.

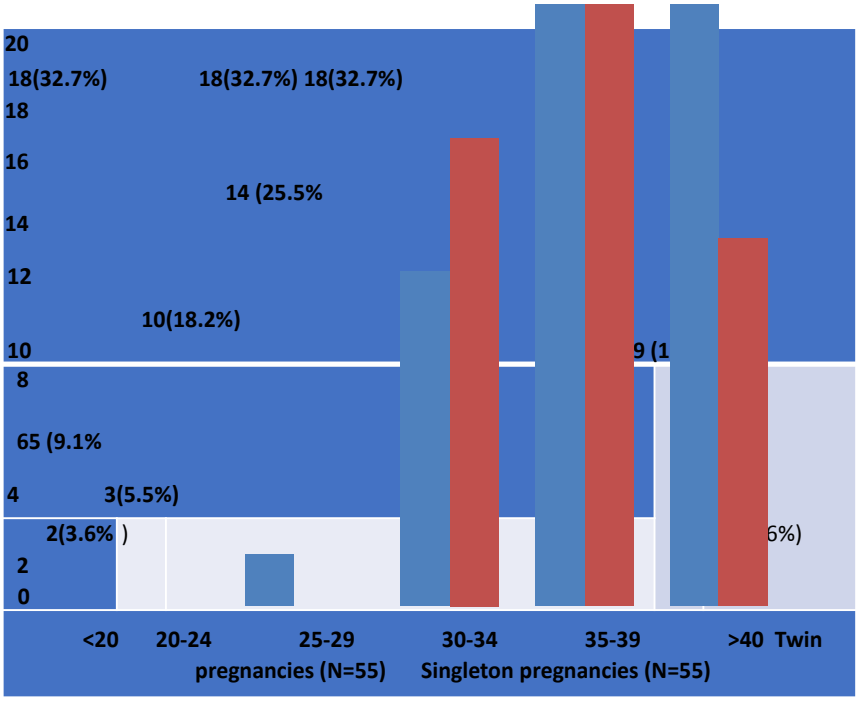

Figure 2. Age group distribution of the participants.

The mean age group of participants with singleton pregnancies was 27.9 ± 5.7 years and the most represented age group was 25 - 29 years (32.7%).

3.2. Distribution of Participants According to Parity

The mean parity of our participants was 1.5 ± 1.2 and 1.9 ± 2.9 in women with twin and singleton pregnancies, respectively. The parities 1 - 2 between were most represented in both groups with 33 (60%) and 24 (43.6%) in twin and singleton pregnancies, respectively (Figure 3).

3.3. Distribution of Participants According to Gravidity

We observed that the mean gravidity of participants was 2.7 ± 1.5 and 2.6 ± 1.5 for twin pregnancies and singleton pregnancies, respectively. The most represented gravidities were between 1 and 2 for both groups, 26 (47.3%) and 28 (50.9%) in twin and singleton pregnancies, respectively (Figure 4).

3.4. Marital Status

Table 1 above shows that, in women with twin pregnancies, 38 (69%) were married, 14 (25.5%) were singles and 3 (5.5%) were concubines. Out of 55 women with singleton pregnancies, 35 (63.6%) were married, 16 (29.1%) were single and 4 (7.3%) living in concubinage.

Table 1. Distribution of participants according to marital status.

Marital status	Twin pregnancy (n = 55)		Singleton pregnancy (n = 55)	
	Frequency (%)	Percentage	Frequency (%)	Percentage
Single	14	25.5	16	29.1
Married	**38**	**69**	**35**	**63.6**
Concubine	3	5.5	4	7.3
Total	55	100	55	100

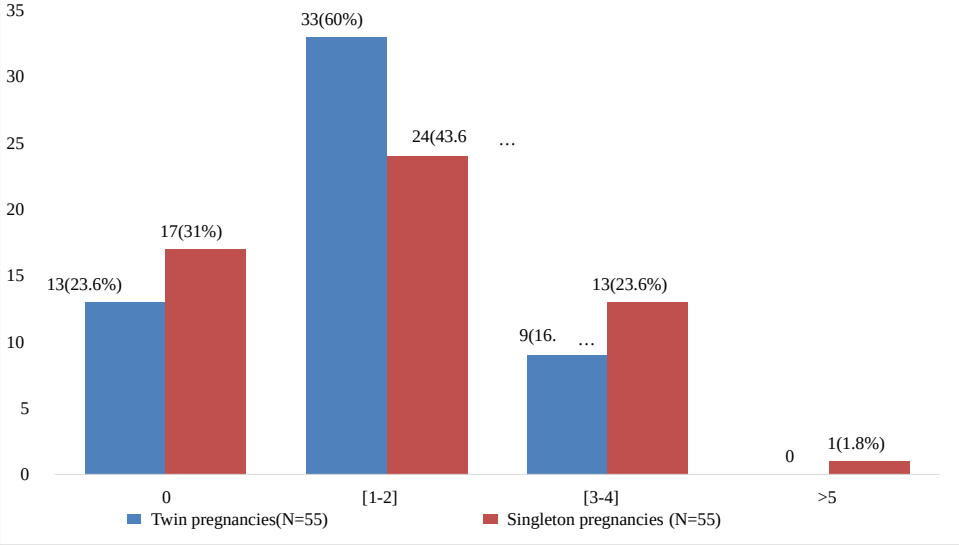

Figure 3. Distribution of participants according to parity.

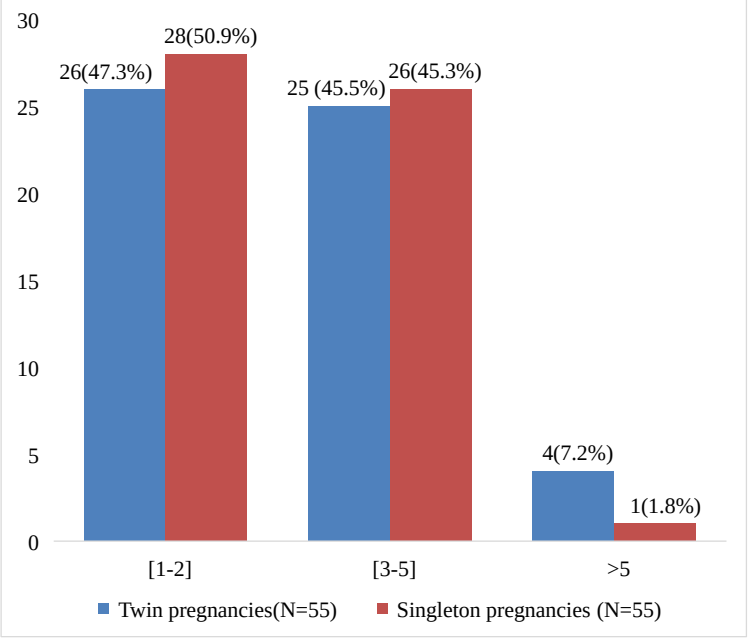

Figure 4. Participants' distribution according to gravidity.

3.5. Distribution of Participants According to Occupation, Level of Education, Family History of Twin, Number of Antenatal Care (ANC)

Table 2 reveals that business was the main occupation of the participants with 32 (58.2%) and 23 (41.8%) of women with twin and singleton pregnancies, respectively. The highest level of education of most of the participants was secondary level with 27 (49%) and 21 (38.1%) of women with twin and singleton pregnancies, respectively. Overall, 42 (76.4%) of the participants attended at least 4 ANC and 36 (65.5%) had a family history of twin pregnancy in the twin pregnancies group meanwhile, 41 (74.5%) of women with singleton pregnancies attended at least 4 ANC and 32 (58%) had a family history of twin pregnancies.

3.6. Prevalence of Twin Pregnancy at the Bamenda Health District (Three Selected Hospitals)

During the study period, there were 1990 deliveries in all, 55 were twin deliveries, giving a prevalence of 2.8% (Table 3).

BRH had the highest rate of twin cases (2.161%) followed by CMA Nkwen (0.452%) and IHC Azire (0.151%).

3.7. Comparison of Fetal and Maternal Outcomes of Twin Deliveries with That of Singleton Deliveries

Table 4 reveals that, the odds of prematurity (gestational age < 37 weeks) were about 6 times higher in twins as compared to singletons (OR: 5.6, 95% CI: 2.214.3, $p < 0.001$). The mean gestational age of twin births was lower compared to that of singleton births and was statistically significant (36.6 ± 2.6 Vs 38.4 ± 4.4, $p = 0.002$) in twins and singletons, respectively.

Low Apgar score (Apgar score < 7) at 1st minute was significantly higher in twin births as compared to singleton births (OR: 3.3, 95% CI: 1.4 - 7.7, p = 0.005). The mean Apgar score at the first minute was significantly lower in twin births compared to singleton births (7.8 ± 2 Vs 8.9 ± 1.2, p = 0.001). The odds of birth asphyxia (Apgar score < 7 at 5th min) were 15.3 times higher in twin births than in singleton births (OR: 15.3, 95% CI: 2 - 116.6, p < 0.001).

There was a statistically significant association between twin births and low birth weight (birth weight < 2500 grams) compared to singleton births (OR: 15.6, 95% CI: 3.6 - 67.8, p < 0.001). The mean birth weight was significantly lower in twin births compared to singleton births and was significant (2515 ± 619.2 grams Vs 3419 ± 484.7 grams, p < 0.001) in twin and singleton, respectively.

Table 2. Participants' distribution according to occupation, level of education, family history of twins, and number of ANC.

Variables	Twin pregnancy (55)		Singleton pregnancy (55)	
	Frequency (%)	Percentage	Frequency (%)	Percentage
Occupation				
Civil servant	8	14.5	11	20
Business	**32**	**58.2**	**23**	**41.8**
Unemployed	8	14.5	8	14.5
Student	7	12.8	13	23.6
Level of education				
None	3	5.5	0	0
Primary	13	23.6	15	27.3
Secondary	**27**	**49**	**21**	**38.1**
Tertiary	12	21.8	19	34.6
Family history of twin				
Yes	**36**	**65.5**	**32**	**58**
No	19	34.5	23	42
Number of ANC				
<4	13	23.6	14	25.5
≥4	**42**	**76.4**	**41**	**74.5**

Table 3. Distribution of population according to different hospitals.

Variables		Twin pregnancy		Singleton pregnancy		Total
		N	%	N	%	1.000
Hospital	BRH	43	2.161	1068	53.668	1111
	CMA Nkwen	9	0.452	692	34.774	701
	IHC Azire	3	0.151	175	8.794	178
Total		**55**	2.764	1935	97.236	**1990**

Table 4. Foetal and maternal outcomes of twin versus singleton deliveries.

Variables	Twins (n%) N = 110	Singleton (n%) N = 55	OR 95% CI	p-value
Gestational age (weeks)				
<37	47(42.7)	6 (11)	5.6 (2.2 - 14.3)	<0.001
>37	63(57.3)	49 (89)	0.2 (0.07 - 0.5)	<0.001
Mean (SD)	36.6 ± 2.6	38.4 ± 4.4		0.002
Apgar score at 1st min (10)				
<7	41 (37.3)	8 (14.5)	3.3 (1.4- 7.7)	0.005
7 - 10	69 (62.7)	47 (85.5)	0.3 (0.1 - 0.7)	0.005
Mean (SD)	7.8 ± 2	8.9 ± 1.2		0.001
Apgar score at 5th min (10)				
<7	25 (22.7)	1 (1.8)	15.3 (2 - 116.6)	<0.001
7 - 10	85 (77.3)	54 (98.2)	0.07 (0.009 - 0.5)	<0.001
Mean (SD)	8.6 ± 1.8	9.5 ± 0.7		0.001
Apgar score at 10th min (10)				
<7	14(12.7)	1 (1.8)	7.2 (1.1 - 57.3)	0.036
7 - 10	96 (87.3)	54 (98.2)	0.2 (0.02 - 0.9)	0.005
Mean (SD)	9.3 ± 1.6	9.9 ± 0.2		0.002
Birth weight (grams)				
<2500	49 (44.5)	2 (3.8)	15.6 (3.6 - 67.8)	<0.001
2500 - 3500	57 (51.8)	33 (59.6)	0.7 (0.4 - 1.4)	0.363
>3500	4 (3.6)	20 (36.5)	0.7 (0.02 - 0.2)	<0.001
Mean (SD)	2515 ± 619.2	3419 ± 484.7		<0.001
Mode of delivery (N = 55)				
CS	28 (50.9)	8 (14.5)	5.5 (2.2 - 13.9)	<0.001

NB: OR = Odds Ratio; CI = Confidence; SD = Standard Deviation.

Caesarean section was significantly higher among women with twin gestations compared to women with singleton gestations (OR: 5.5, 95% CI: 2.2 - 13.9, p < 0.001).

3.8. Estimated Blood Loss According to the Type of Pregnancy

It was observed that 8 (14.5%) of women with twins had an estimated blood loss > 1000 ml compared to 4 (7.3%) of women with a singleton. The estimated blood loss was higher in twin delivery than in singleton deliveries with the median of 350 (150 - 750) ml versus 250 (150 - 475) ml in twin and singleton deliveries, respectively; though, was not statistically significant (Table 5).

Table 5. Estimated blood loss in twin versus singleton deliveries.

Modalities	Twin deliveries N = 55 (n, %)	Singleton deliveries N = 55 (n, %)	OR, 95% CI	p
Hb before delivery (g/dl)				
<11	6 (11.5)	13 (23.6)	0.4 (0.1 - 1.3)	0.120
11 - 13	34 (61.5)	29 (52.7)	1.4 (0.6 - 2.9)	0.427
>14	15 (27)	13 (23.6)	1.2 (0.5 - 2.9)	0.651
Hb after delivery (g/dl)				
<11	21 (38.2)	26 (47.3)	0.7 (0.3 - 1.6)	0.427
11 - 13	31 (56.4)	24 (43.6)	1.6 (0.7 - 3.4)	0.239
>14	3 (5.4)	5 (9.1)	0.6 (0.1 - 2.5)	0.715
Estimated blood loss (ml)				
<500	37 (67.4)	41 (74.5)	0.7 (0.3 - 1.6)	0.387
500 - 1000	10 (18.1)	10 (18.2)	1 (0.4 - 2.8)	1.000
>1000	**8 (14.5)**	**4 (7.3)**	**2.2 (0.6 - 7.7)**	**0.220**
Median (IQR)	350 (150 - 750)	250 (150 - 475)		0.304

IQR: Interquartile range; OR: Odds Ratio; CI: Confidence Interval.

4. Discussion

In this study, we described the sociodemographic characteristics of women with twin pregnancies, we determined the prevalence of twin pregnancies at the BHD (in three selected hospitals), and we identified and compared, the fetal and maternal outcomes of twin and singleton deliveries in the three selected hospitals at the BHD.

4.1. Sociodemographic Characteristics of Women with Twin Pregnancies

Increased maternal age, parity, ethnicity, and family history of twinning are strongly associated with an increased rate of twinning.

It was observed in the current study that, the maximum number of twins occurred in women aged between 25 - 29 (32.7%) and 30 - 34 (32.7%) years with a mean maternal age of 28.6 ± 5.8 years. These findings agree with those of a study done in Abuja, Nigeria which found that the majority of the women with twin pregnancies were aged between 25 - 29 years with a mean age of 28.4 ± 4.69 years (39%) [15]. Similar findings were also revealed in a study done in Northern Tanzania where more than half of the women with twins were aged between 26 and 35 years with a mean age of 29 ± 5.7 years [16] [17] [18] [19]. Another study in a Nigeria tertiary hospital reported a higher mean maternal age of 30 ± 2.34

years compared with what we observed in the current study [14]. The difference may be due to the large sample size that was used.

In the current study, most women with twin pregnancies were between parity groups 1 - 2 (60%), and the mean parity was 1.5 ± 1.2. These results disagree with those found in a study done at a tertiary Hospital in Abuja, Nigeria where the mean parity was 2.0 ± 1.8 in women with twin pregnancies [15] [20]. The observed difference may be explained by a longer study duration (10 years Vs 4 months) for their study and the present study, respectively, and the large sample size that was used.

Family history of the twin was present in more than half 40 (76.9%) of women with twin pregnancy in the current study. This result was also reported by previous studies.

4.2. Prevalence of Twin Pregnancy at the Bamenda Health District (Three Selected Health Structures)

The prevalence of twin deliveries at the Bamenda Health District (three selected health facilities) was 2.8%. A comparable finding (2.8%) was observed in a study done in Burkina Faso to assess the prevalence, mortality, and provision of obstetric care in twins [21]. The similarity in the two studies may be explained by the fact that both were Hospital-based studies. This prevalence was higher compared to those observed in Delta Niger (2.4%), Northern Tanzania (2.1%), and Nairobi (2.0%) [14] [16] [17]. The difference may be due to variation in the twinning rate according to ethnicity. Also, the finding in this study showed a low prevalence compared to those found in Nigeria, the Democratic Republic of Congo, and Niger (4.2%, 3.8%, 3.6%), respectively [18]. This observed difference may be attributed to the study setting with Nigeria being known as the country with the highest twinning rate in sub-Saharan Africa. In developed countries, the twinning rate is also high (3%) compared to this study. Several studies attributed this to the increased use of assisted reproductive technology which has not yet been intensified in developing countries [18].

4.3. Comparison of Fetal and Maternal Outcomes of Twins and Singleton Deliveries

In the present study, prematurity (born before 37completed weeks gestational age) was the leading adverse fetal outcome in twins as compared to singleton deliveries 42.7% Vs 11%, respectively. The risk of prematurity in twins was about 6 times that of singletons (OR: 5.6, 95% CI: 2.2 - 14.3, $p < 0.001$). This finding corroborates with what was found in a Nigerian tertiary hospital in 2011 where the risk of prematurity in twins was about 6.5 times that of singletons (OR: 6.47, CI: 2.70 - 17.05) [14]. This was higher compared to what was found in a study done in India in 2017 which revealed that the risk of prematurity in twins was about 2 times that of singletons (OR 2.0073; 95% CI: 1.0509 - 3.8342) [19]. The difference observed may be explained by the occupation of the participants which was mainly business in more than half of the cases. It may be also ex-

plained by other complications associated with twin pregnancy such as malpresentation, premature rupture of membrane, or preeclampsia which required early intervention for termination of the pregnancy. The present study showed the mean gestational age at delivery of (36.6 ± 2.6 Vs 38.4 4.4, p = 0.002) weeks for twin and singleton pregnancies, respectively. This was higher than (34 ± 5.2 Vs 38 ± 2.40, p < 0.05) weeks for twins and singletons, seen in a study done in Nigeria (35.9 Vs 38.5) weeks [14]. Lower mean gestational age at delivery (34.5 ± 1.8 Vs 38.7 ± 1.5 p < 0.05) weeks for twins and singletons, respectively was reported at Fatemieh hospital, Iran [10]. Using of Ballard score in addition to GA calculated from the first day of the last menstrual period to the date of delivery to determine maturity with more precision may explain the difference.

The odds of birth asphyxia (Apgar score < 7 at 5th min) were 15.3 times higher among twin births than singleton births (OR: 15.3, 95% CI: 2 - 116.6, p < 0.001). This was higher than what was reported in a study done to determine adverse perinatal outcomes of multiples births in Southwest Nigeria where multiple births were associated with a low Apgar score at the 5th minute was about two times increased among twins than singleton births (OR: 1.60, 95% CI: 1.13 - 1.93) [9].

We observed in this study that, the risk of low birth weight was about 15 times higher among twins than in singletons (OR: 15.6, 95% CI: 3.6 - 67.8, p < 0.001). This finding was higher compared to that of other reports: In a Nigeria tertiary hospital in 2011, where it was about 9 times higher in twins than singletons (OR: 9.33, 95% CI: 4.35 - 20.95) and in Southwest Nigeria in 2011 where it was 6 times higher (OR: 6.45, 95% CI: 4.80 - 8.66) [9] [14]. This finding was also higher than what was found in Southwest Ethiopia at Jimma University in 2015 where the risk of low birth weight among twin births was about two times higher than in singleton births (OR: 1.74, 95% CI: 1.23 - 2.44) [20]. The difference may be due to a significantly increased rate of prematurity (42.7%) which is usually associated with low birth weight.

Twin pregnancies in comparison with singleton pregnancies are associated with increased maternal outcomes during and after delivery [21]. In the present study, caesarean section was more than five times more common among women with twin pregnancies than women with singleton pregnancies (OR:). This finding disagreed with that of a study done in a Nigeria tertiary hospital which reported that the risk of delivering a twin pregnancy via caesarean section was three times that of singleton pregnancy (OR: 2.9, 95% CI: 1.48 - 5.76) [14]. This increased rate in the use of CS to deliver to women with twin pregnancies may be due to other co-indication of CS such as malpresentation, premature rupture of membrane, and hypertensive disorders as indicated in the literature.

Previous studies reported a postpartum haemorrhage (estimated blood loss of more than 500 ml after NVD, or more than 1000 ml after CS) to be highly significant among women with twins compared to women with singleton deliveries. A study done on a comparative assessment of foeto-maternal outcomes in twin pregnancies with singleton pregnancies at a tertiary care centre in India re-

vealed that PPH was 2.75 folds higher in twins as compared to the singleton group [19]. Another study on a review of twinning in Niger Delta, Nigeria also reported that women with twin pregnancies were significantly more than twice as prone to PPH and had approximately 200 ml mean estimated blood loss as the control counterparts, ($p < 0.001$) [22]. In the present study contrary, we observed that PPH was not statistically associated with twin delivery, $p > 0.05$ and the median estimated blood loss was: 350 (150 - 725) Vs 250 (150 - 475) ml. This may be due to the systematic use of sublingual and/or intrarectal misoprostol for the prevention of postpartum haemorrhage in our setting. This difference may also be explained by our small sample size which could not show the statistical significance.

5. Conclusions

At the end of this study, we concluded that twin pregnancies occurred mostly in multiparous (1 - 2) women aged between 25 - 34 years with the maternal mean age of 28.6 ± 5.8 years, with a family history of twins in more than 2/3 of cases.

The prevalence of twin pregnancies at the Bamenda Health District (three selected hospitals) was 2.8%.

Twin pregnancies were associated with adverse fetal outcomes (prematurity, low birth weight, and birth asphyxia) and maternal outcomes (caesarean section).

This study found that women with twin pregnancies were more likely to deliver premature, low birth weight, and asphyxiated babies, as compared to women with singleton pregnancies ($p < 0.05$). Caesarean section was more likely to be carried out among twin deliveries compared to singleton deliveries. There was no significant association between twin deliveries and PPH.

Recommendations

Based on the findings and conclusions of this study, we, therefore, make the following recommendations.

Health facilities should target as early as possible all women with twin pregnancies and establish a schedule for better sensitization about possible risks that come with twin pregnancies and follow-up: one woman with twin pregnancies = one gynaecologist regardless of complications.

Management of twin delivery should be multidisciplinary and should be done by skilled personnel (neonatologists, gynaecologists, anaesthetists, and trained nurses).

To prescribe bed rest from 26 weeks of gestation to avoid premature delivery

Women with twin pregnancies should start ANC as early as possible and deliver in a well-equipped hospital where premature, low birth weight, and asphyxiated babies' can receive immediate and intensive care.

Community researchers should carry out a prospective study on outcomes of premature and low birth weight infants following twin deliveries.

Authors' Role (From Left to Right)

- Conceptual design of the work;
- Data collection and methodology;
- Data analyst;
- Proof reader 1;
- Proof reader 2.

Conflicts of Interest

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

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