

# Determinants, incidence and perinatal outcomes of multiple pregnancy deliveries in a low-resource setting, Mpilo Central Hospital, Bulawayo, Zimbabwe

## Abstract

**Background:** Multiple pregnancies are high risk pregnancies compared to singletons. They may result in poor foeto-maternal outcomes. Traditionally, these pregnancies are associated with anaemia, preeclampsia, preterm deliveries and postpartum haemorrhage. In low-resource settings, these women and their babies may face increased risks of poor perinatal outcomes. The objective of this study was to document for the first time the determinants, incidence and perinatal outcomes of multiple pregnancies for Mpilo Central Hospital.

**Methods:** This was a retrospective descriptive study covering the period between 1 January 2017 and 31 December 2017 in a tertiary teaching hospital. A paper data collection sheet was used to collect the information. All twin/triplet deliveries >24 weeks gestation born at the labour ward were included in the study. The data was then analysed.

**Results:** The incidence of multiple pregnancy at Mpilo Central Hospital was 1.7%. The 20-25 year old age group had the highest percentage at 25.5%. Nulliparous women had the highest percentage at 28.4% of the patients. Booked/referred patients constituted the majority at 45.4%, followed by institutional booked at 39.0%. 37.5% of the pregnancies were preterm (<36+6 weeks gestation). The majority (97.2%) had no postnatal complications. 2.8% had postpartum haemorrhage. There was a statistical difference between the two groups,  $P=0.05$ . There were no maternal deaths. 93.2% were live births and 6.8% were stillbirths, with a statistical difference between the two groups,  $P=0.05$ . Female/female twins were 28.4%, male/male 26.9% and the majority being mixed at 44.7%. The majority (81.6%) had good 1 minute Apgar scores >7 and 18.4% had 1 minute Apgar scores <7, with a statistical difference between the two groups,  $P=0.01$ . By 5 minutes, a vast percentage 92.3% had Apgar scores >7 and only 7.7% had Apgar scores <7, with a statistical difference between the two groups,  $P=0.05$ .

**Conclusion:** The incidence of multiple pregnancy at Mpilo Central Hospital was 1.7%. The major determinants of multiple pregnancies were the 20-25 year old age group, nulliparity and being <36+6 weeks of gestation. The majority of women had no postnatal complications and there were no maternal deaths. The majority of babies were live births with good 1 minute Apgar scores >7. The babies were of good birth weights (2501-3000g).

**Keywords:** multiple pregnancy, determinants, incidence, perinatal, outcomes, low-resource, settings

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**Abbreviations:** ARV, antiretrovirals; HIV, human immunodeficiency virus; LSCS, lower segment caesarean section; SD, standard deviation

## Background

Mpilo Central Hospital is located in Bulawayo and delivers 9000 deliveries per year. Bulawayo is the second largest city in Zimbabwe after the capital city Harare, with a population of 653,337 as of the 2012 census.<sup>1</sup> The unit receives referrals from urban and rural centres. It is located in Matabeleland, 439 km southwest of Harare, on the way to Victoria Falls. Multiple gestations are high risk pregnancies associated with significant poor perinatal outcomes compared to singletons.<sup>2</sup> In low- and middle-income countries they pose a high risk to mothers due to inherent biological risks and scarcity of health resources.<sup>3</sup> In low-resourced, Nigeria the incidence

of twin gestation was found to be 2.3%, the highest in the world.<sup>4,5</sup> The second twin is at greater risk of adverse perinatal outcome than the first twin.<sup>6</sup> The second twin could die or suffer brain damage due to delayed delivery. Women with multiple gestations should have prompt recourse to emergency caesarean section to avoid poor fetal outcomes. Complications of multiple gestations include anaemia, preeclampsia/eclampsia and preterm labour. The women are at risk of postpartum haemorrhage and death. The fetal complications include twin-twin transfusion syndrome in monochromic twins, congenital malformations, intrauterine death, complications of prematurity, locked twins and birth asphyxia. Women with such high risk pregnancies should book early; have an early ultrasound for dating, fetal number and chorionicity. They should book in a centre where there is comprehensive emergency obstetric care. In low-resource settings, women carry such high risk pregnancies without access to such resources.

## Methods

This was a retrospective descriptive study covering the period between 1 January 2017 and 31 December 2017 in a tertiary teaching hospital. A paper data collection sheet was used to collect the information. All twin/triplet deliveries >24 weeks gestation born at the labour ward were included in the study. The data was then analysed. The SPSS Version 21 (IBM Corp., Armonk, NY, USA) statistical tool was used to calculate the mean and standard deviation (SD) figures. Descriptive statistics were used to examine patients' characteristics and the outcomes. Chi-square test was used to calculate P-values. A P-value of <0.05 was considered statistically significant.

## Results

There were 8439 live births at the unit the period between 1 January 2017 and 31 December 2017. There were 141 multiple pregnancies made up of 140 sets of twin pregnancies and 1 set of triplets. There were 283 babies born, 3 were born at home leaving 280 babies for analysis. The incidence of multiple pregnancy at Mpilo Central Hospital was 1.7%. Tables 1-4 show most of the results. The 20-25 year old age group had the highest percentage at 25.5%. Teenagers (16-19 year olds) accounted for 12.8% of the patients. After the age of 36 years, multiple pregnancy rates decline with those >40 years accounting for only 0.7%. Nulliparous women had the highest percentage at 28.4% of the patients, followed by Para 1 at 25.5% and grandmultiparous women at 10.7%. Booked/referred patients constituted the majority at 45.4%, followed by institutional booked at 39.0%. Unbooked cases were 15.6%. HIV infected women were 19.9%, the majority (62.4%) were seronegative and 17.7% of the patients presented with unknown HIV status. 37.5% of the pregnancies were preterm (<36+6 weeks gestation), 30.6% were term (37-40 weeks gestation) and 6.4% were postdates (>40 weeks gestation). More than a quarter (25.5%) was of unknown gestation. More than half (50.5%) had no antenatal complications. Other complications included preeclampsia (5.7%), abruption (2.1%), retained twin (2.1%), anaemia, hand prolapsed and footling breech all at 0.7% each (Table 1).

Most (57.4%) were delivered by caesarean section for the leading breech twin and 2.1% for a retained twin. The commonest vaginal delivery was cephalic/cephalic (31.9%), followed by breech/breech (5.0%), cephalic/breech (4.3%) and the least was breech/cephalic (1.4%). There were no vacuum or forceps deliveries. The majority (97.2%) had no postnatal complications and 2.8% had postpartum haemorrhage. There was a statistical difference between the two groups, P=0.05. There were no cases of maternal deaths during the study period (Table 2).

Live births constituted 93.2% and 6.8% were stillbirths, with a statistical difference between the two groups, P=0.05. Female/female twins were 28.4%, male/male 26.9% and the majority being mixed at 44.7%. The majority (81.6%) had good 1 minute Apgar scores >7 and 18.4% had 1 minute Apgar scores <7, with a statistical difference between the two groups, P=0.01. By 5 minutes, 92.3% had Apgar scores >7 and only 7.7% had Apgar scores <7, with a statistical difference between the two groups, P=0.05. There was 1 set of conjoined twins and these weighed 4500g and 1 papyraceous twin that was not weighable, leaving 278 babies for birth weight analysis. The commonest birth weights range was 2501-3000g (28.1%) (Table 3 & Table 4).

**Table 1** Maternal demographic details

Characteristic	N=141 (%)	P value
Age(years)		
Dec-15	0(0%)	
16-19	18(12.8%)	
20-25	36(25.5%)	
26-30	31(22.0%)	
31-35	35(24.8%)	
36-40	16(11.3%)	
41-45	4(2.9%)	
>45	1(0.7%)	
Parity		
0	40(28.4%)	
1	36(25.5%)	
2	25(17.7%)	
3	25(17.7%)	
4	9(6.4%)	
5	6(4.3%)	
Gestational age(weeks)		
<28	4(2.8%)	
28+1-33+6	16(11.3%)	
34-36+6	33(23.4%)	
37-40	43(30.6%)	
>40	9(6.4%)	
Unknown	36(25.5%)	

**Table 2** Maternal characteristics

Variable	N=141 (%)	P value
Booking status		
Booked >4 ANC visits	55(39.0%)	
Booked(referral)	64(45.4%)	
Unbooked	22(15.6%)	0.1
HIV status		
HIV -ve	88(62.4%)	
HIV +ve	28(19.9%)	
Unknown	25(17.7%)	0.1
ARV's	28	
Antenatal complications		
None		
Preterm labour	71(50.5%)	
Preeclampsia	53(37.5%)	
Abruptio	8(5.7%)	
Retained twin	3(2.1%)	
Hand prolapse	3(2.1%)	
Anaemia	1(0.7%)	
Footling breech	1(0.7%)	
	1(0.7%)	

**Table 3** Mode of delivery and maternal complications

Variable	N=141/(%)	P value
Mode of delivery		
Vacuum/forceps	0(0%)	
LSCS(twin 1 breech)	81(57.4%)	
LSCS(retained twin)	3(2.1%)	
Vaginal(cephalic/cephalic)	45(31.9%)	
(breech/breech)	7(5.0%)	
(cephalic/breech)	6(4.3%)	
(breech/cephalic)	2(1.4%)	
Maternal complications		
None	137(97.2%)	
Postpartum haemorrhage	4(2.8%)	0.05
Maternal death	0(0%)	

**Table 4** Fetal characteristics

Variable	N=280/(%)	P value
Outcome		
Live births	261(93.2%)	
Stillbirths	19(6.8%)	0.05
Fetal sex		
Female	144(51.4%)	
Male	136(48.6%)	
Combination types		
Female/female	40(28.4%)	
Male/male	38(26.9%)	
Mixed	63(44.7%)	
Apgar scores		
1 minute <7	48(18.4%)	
1 minute >7	213(81.6%)	0.01
5 minute <7	20(7.7%)	
5 minute >7	241(92.9%)	0.05
Birth weight N=278		
500-1000g	18(6.4%)	
1001-1500g	21(7.6%)	
1501-2000g	60(21.6%)	
2001-2500g	78(28.1%)	
2501-3000g	81(29.1%)	
3001-3500g	19(6.8%)	
3501-4000g	0(0%)	
>4000g conjoined	1(0.4%)	

## Discussion

The incidence of multiple pregnancy at Mpilo Central Hospital

was found to be 1.7% lower than that reported elsewhere in Nigerian hospitals.<sup>4,5</sup> The younger age groups (<25 years) and nulliparity were associated with higher twinning rates than other groups. Older grandmultiparous women had lower rates. This is probably due to declining fertility rates with advancing age. A study in Nairobi, Kenya also had similar findings.<sup>7</sup> Despite being high risk groups, referring centres seemed to have booked multiple gestations and referred them when complications arose. Some women were unbooked (15.6%). This needs changing so that such women are all booked at the tertiary centre where facilities for emergency caesarean section are readily available.

The HIV seropositive rate was 19.9% and 17.7% being of unknown status. They could potentially result in babies being exposed to HIV infection. The prevalence of HIV infection amongst the obstetric patient in the unit is 16%, the national figure for Zimbabwe is 15% amongst adults 15 years and above.<sup>8</sup> The figure for HIV seropositive in multiple pregnancy deliveries was slightly higher than the unit and national average.

More than a third (37.5%) were delivered premature (<36+6 weeks gestation) confirming the classical commonest association between multiple gestations and preterm delivery.<sup>9</sup> There were 15.6% of unbooked patient which is a recurring theme in low-resourced countries, in a study in Nigeria the figure was as high as 65.7%.<sup>10</sup> A quarter of women had unknown gestation due to a combination of being unbooked and lack of access to ultrasonography.

Most women had caesarean section for the leading twin being breech and a retained second twin (total 59.5%). The commonest vaginal delivery was cephalic/cephalic at 31.9% of the cases. The immediate postnatal complication was postpartum haemorrhage at 2.8%. This is lower than that reported in a study in Nigeria where it was found to be 8.5%.<sup>11</sup> There were no cases of maternal deaths recorded among the 141 women. There majority of fetal outcome were live births and minority were stillbirths, with a statistical difference between the two groups, P=0.05. Therefore multiple pregnancy mainly ended in live births. There is lack of ultrasonography services and ultrasound scans for dating and determining chorionicity are not the routine. Women either present late for such testing or simply do not book but present in labour. The immediate perinatal period seemed to be encouraging with the majority of newborn infants having good 1 minute Apgar scores >7.

## Conclusions

The incidence of multiple pregnancy at Mpilo Central Hospital was found to be 1.7% lower than that reported elsewhere in the literature. The younger age groups (<25 years) and nulliparity were associated with higher twinning rates than other groups. More than a third (37.5%) were delivered premature (<36+6 weeks gestation). There were no cases of maternal deaths recorded among the studied women. The fetal outcome was good with the majority being live births. The immediate perinatal period seemed to be encouraging with the majority of newborn infants having good 1 minute Apgar scores >7. There is need to improve the referral system so that all multiple pregnancies are booked at a tertiary centre with recourse to prompt emergency caesarean section for complications. Due to limited resources, early ultrasound scans to determine chorionicity and screen for twin-twin transfusion syndrome remain difficult in low-resourced settings.

## Declarations

### Ethics approval and consent to participate

The Ethics Committee at Mpilo Central Hospital gave a waiver for retrospective and non-intervention studies to go ahead in the institution as long as the data remained anonymous. No ethical issues arose during the study as all the data was anonymous. No patient consent was necessary. Minutes of the Committee's inaugural meeting held on the 13th October 2016 set out the requirements of all the studies at the institution.

### Acknowledgments

None.

### Conflicts of interest

The author declares there are no conflicts of interest.

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