



# A Review of Twin Gestations in a Tertiary Hospital in Port Harcourt.

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## ABSTRACT

**Background:** Twin gestation results from the conception of two fetuses at the same time in a woman. It can be monozygotic or dizygotic. Globally, twins have the highest incidence amongst the multiple gestations and are considered as high risk pregnancies. In Nigeria twinning has major obstetric significance because the highest rate in the world occurs in this country, with an incidence of 54 in 1000 births.

**Aim:** This is to review twin gestations at the University of Port Harcourt Teaching Hospital (UPTH).

**Method:** This was a retrospective descriptive study of twin gestations carried out in the Department of Obstetrics and Gynaecology, UPTH over a 5-year period. The data obtained were recorded in a personal computer and analysed using Statistical Package for Social Sciences (SPSS) software package (version 23.0; Chicago, Illinois, USA). Simple frequency tables and charts were used to illustrate the analysed data. The Student's t-test was used to assess for statistically significant differences between groups with a value of  $p < 0.05$  considered statistically significant.

**Results:** There were 6850 deliveries for the period under review, with 238 twin deliveries, out of which 232 case notes were retrieved; giving a case note retrieval rate of 97.5%. The incidence of twin delivery was 33.8 per 1000 deliveries. The mean age and parity were  $28.99 \pm 4.71$  years and  $2.30 \pm 1.49$  respectively. Multiparous women had the highest number of twin deliveries, accounting for 49.6%. For mode of conception, assisted reproductive technology (ART) made up 27.2%, while 72.8% of the cases conceived naturally. For the mode of delivery in twin pregnancies in this study caesarean section accounted for 38.4%, while 61.6% had vaginal delivery. The male-male sex combination was the most frequent, accounting for 29.7%. Same sex pair delivery accounted for 56.9% of twin deliveries. The cephalic-cephalic presentation combination was also predominant, accounting for 46.9%. The average gestational age at delivery of twins was  $37.4 \pm 2.27$  weeks. The commonest maternal complications were those of preterm delivery, abnormal presentation, hypertensive disorders of pregnancy and anaemia.

**Conclusion:** The study revealed the incidence of twin delivery was 33.8 per 1000 deliveries. A significant percentage conceived through ART (27.2%) and delivered by caesarean section (38.4%). The male-male sex combination was the most frequent, accounting for 29.7%. Preterm delivery and malpresentation were part of the commonest maternal complications encountered. Twin pregnancy is a high risk pregnancy and this should always be managed as such to improve on the case outcomes.

## INTRODUCTION

Twin gestation results from the conception of two fetuses at the same time in a woman.<sup>1</sup> It can be monozygotic or dizygotic. Globally, twin gestation has the highest incidence amongst the multiple gestations which are considered as high risk pregnancies.<sup>2</sup>

In Nigeria twinning has major obstetric significance because the highest rate in the world occurs in this country, with an incidence of 54 in 1000 births.<sup>1,3</sup> Incidences of 9.8 to 13.6 in 1000 and 4 in 1000 births have been reported in Britain and Japan respectively.<sup>2,4</sup> Risk factors include increased use of ovulation induction drugs and assisted reproductive technologies.<sup>4</sup> Other risk factors include family history of twinning and advanced maternal age, as well as race, parity and environmental factors.<sup>4</sup>

The complications of twin gestation may occur during pregnancy, delivery or in the postnatal period.<sup>5</sup> Early in pregnancy spontaneous abortions and congenital malformations are commoner with twin gestations.<sup>5</sup> In the second half of pregnancy anaemia, preeclampsia-eclampsia, preterm labour, intrauterine growth restriction (IUGR), antepartum haemorrhage, fetal malpresentation, caesarean section and perinatal death are all known to occur at a higher frequency in twin gestations.<sup>6,7</sup>

Deciding on the route of delivery in twin gestation is an important component of care that must be thoughtfully considered. Vaginal delivery is considered when the first twin is presenting cephalic.<sup>8,9</sup> For the delivery of the second twin additional manoeuvres such as external cephalic version, internal podalic version and breech extraction may come into play. Caesarean section is usually preferred for non-cephalic presenting first or leading twin.<sup>10</sup> Combined delivery is occasionally employed for retained second twin, whereby the leading twin is delivered vaginally while the retained second twin is delivered by caesarean section. Monitoring of labour in twin gestation requires more expertise as two babies are involved.<sup>8-10</sup>

In sub-Saharan Africa twin pregnancies are associated with increased maternal morbidity and mortality and significant higher healthcare costs.<sup>11</sup> They also account for a significant part of the perinatal deaths.<sup>10</sup> Due to the high adverse maternal and perinatal outcomes associated with twin gestations there is a need to identify factors that influence the outcome, and if possible modify those factors in order to improve on the overall outcome of pregnancy in twin gestations.

Although a previous study of twin gestations was done at this centre,<sup>12</sup> there is the need to update the extent to which an upsurge in assisted reproductive technologies uptake may have affected the prevalence and outcomes of twin pregnancies. International registries have demonstrated a marked increase in the prevalence of twin gestations to epidemic proportions since the introduction of in vitro fertilisation (IVF) and intracytoplasmic sperm injection (ICSI) programmes.<sup>13</sup>

Despite contrasting reports it has been shown that naturally conceived twins and assisted reproductive technology (ART) conceived twins are more or less similar in terms of maternal and fetal outcomes.<sup>13,14</sup>

This study aims at determining the prevalence, methods of conception, modes of delivery and maternal outcomes in twin gestations managed at the University of Port Harcourt Teaching Hospital (UPTH), which is a tertiary health facility, over a five-year period. This study would provide relevant clinical and public health information that would help the centre and others to understanding and managing twin gestations better.

**Aim:** This is to review twin gestations at the University of Port Harcourt Teaching Hospital (UPTH).

## METHODOLOGY

This was a retrospective descriptive study of twin gestations carried out in the Department of Obstetrics and Gynaecology, UPTH over a 5-year period from 1<sup>st</sup> January, 2013 to 31<sup>st</sup> December, 2017. The women with twin pregnancies were managed by consultant-led units, with the deliveries usually conducted by senior obstetricians over the study period. The labour ward records, labour ward (obstetric) theatre records and postnatal clinic records were retrieved and reviewed to identify patients who had delivery of twin pregnancy in the hospital during the study period. Case notes of all pregnant women who had delivery of twin gestation after 28 weeks of gestation were retrieved from the records department of the hospital. The following data were collected from each folder, namely: age, parity, pregnancy details, sex and birth weight of the babies, fetal presentation, and mode of delivery, fetal outcome and associated complications.

Inclusion criteria were all cases of twin delivery during the study period irrespective of age or booking status. Higher-order multiple pregnancies and twin pregnancies with expulsion of the fetuses or termination of pregnancy before 28 weeks of gestation were excluded from the study.

The data obtained were recorded in a personal computer and analysed using Statistical Package for Social Sciences (SPSS) software package (version 23.0; Chicago, Illinois, USA). Simple frequency tables and charts were used to illustrate the analysed data. The Student's t-test was used to assess for statistically significant differences between groups with a value of  $p < 0.05$  considered statistically significant.

## RESULTS:

The total number of deliveries within the study period was 6856 (2025 deliveries in 2013, 869 deliveries in 2014, 1380 deliveries in 2015, 1134 deliveries in 2016, and 1448 deliveries in 2017). There were 238 twin

deliveries during the study period, out of which 232 case notes were retrieved, giving a case note retrieval rate of 97.5%. The incidence of twin delivery was 33.8 per 1000 deliveries; using only those with retrieved case notes. The twin deliveries were 68, 26, 50, 32 and 56 for 2013, 2014, 2015, 2016 and 2017 respectively, giving an incidence per year of 33.6/1000, 30/1000, 36.2/1000, 28.2/1000 and 38.7/1000 respectively (Tab.1).

The age range for those that had twin delivery was 15 to 44 years and the mean age was  $28.99 \pm 4.71$  years (Table 2). Twin delivery was commonest in the 25 to 29 years age group and least among the teenagers. For parity distribution of women who had twin delivery, the mean parity was  $2.30 \pm 1.49$  (Table 2). Multiparous women (para 2 to para 4) had the highest number of twin deliveries, accounting for 49.6%, while grand multiparous women accounted for 10.3%. The number of booked women (those that had antenatal care) was 187 (80.6%), while 45 (19.4%) of the women were unbooked (those without antenatal care).

For mode of conception, assisted reproductive technology (ART) made up 27.2% (in vitro fertilisation- 22.4%, ICSI- 4.8%) and these women were all booked, while 72.8% of the cases conceived naturally (Figure 1). No patient conceived by intrauterine insemination (IUI) in the study. The possible impact of intake of ovulation induction medications in those that conceived naturally and sex selection in those who conceived with the help of ART were not looked at in this study.

For the mode of delivery in twin pregnancies in this study caesarean section accounted for 38.4%, while 61.6% had vaginal delivery (Figure 2). The average gestational age at delivery of twins was  $37.4 \pm 2.27$  weeks. The range of gestational age at delivery was 28 to 42 weeks. About 29.7% of the deliveries were below 37 weeks. The male-male sex combination was the most frequent, accounting for 29.7%. Same sex pair delivery accounted for 56.9% of twin deliveries. The cephalic-cephalic presentation combination was also predominant, accounting for 46.9%, while the non-cephalic first twin was 27.1%. The commonest chorionicity was the dichorionic diamniotic (61.2%) variety, with monochorionic monoamniotic accounting for only 0.9% (Table 3).

For the indications for caesarean section in women with twin delivery, the commonest indication was malpresentation in the first twin in 46 women (51.7%), followed by hypertensive disorders in 15 women (16.9%). One woman each (1.1%) had caesarean section for twin-twin transfusion syndrome (TTTS), retained second twin and intrauterine growth restriction (Table 4). The commonest maternal complications were those of preterm delivery, abnormal presentation, hypertensive disorders of pregnancy and anaemia. There were no complications in 126 (54.3%) of the women. There was no significant difference between the ART and natural conception groups in terms of indications for caesarean section and maternal outcomes (Table 5).

**Table 1: Total deliveries for the study period**

YEAR	TOTAL DELIVERIES	TWIN DELIVERIES	RATE PER 1000 DELIVERIES
2013	2025	68	33.6/1000
2014	869	26	30/1000
2015	1380	50	36.2/1000
2016	1134	32	28.2/1000
2017	1448	56	38.7/1000
	TOTAL= 6856	TOTAL= 232	MEAN= 33.8/1000

**Table 2: Maternal demographic characteristics**

Variable	N	%	Mean	Range
<b>Age</b>				
15-19	3	1.3	28.99 ±4.71	15-44
20-24	29	12.5		
25-29	95	40.9		
30-34	67	28.9		
35-39	34	14.7		
40-44	4	1.7		
<b>Parity</b>				
0	13	5.6	2.30 ±1.49	0-11
1	80	34.5		
2-4	115	49.6		
≥5	24	10.3		
<b>Booking status</b>				
Booked	187	80.6		
Unbooked	45	19.4		

Booked: Had antenatal care during pregnancy.

Unbooked: No antenatal care during pregnancy.

**Table 3: Fetal characteristics**

Variable	N	%	Mean	Range
<b>GA at delivery (weeks)</b>				
28 - <34	14	6.0	37.42 ±2.27	28-42
34- <37	55	23.7		
37- <40	154	66.5		
40.- <42	9	3.8		
<b>Sex combination</b>				
Male/male	69	29.7		
Female/female	63	27.2		
Female/male	49	21.2		
Male/female	51	21.9		
<b>Presentation combination</b>				
Cephalic/cephalic	119	51.3		
Cephalic/non-cephalic	50	21.6		
Non-cephalic/cephalic	46	19.8		
Non-cephalic/non-cephalic	17	7.3		
<b>Chorionicity</b>				
Dichorionic/diamniotic	142	61.2		
Monochorionic/diamniotic	88	37.9		
Monochorionic/monoamniotic	2	0.9		

GA: Gestational age.

**Table 4: Indications for caesarean section**

Conception method	Total		Natural		ART		p-value
	N	%	N	%	N	%	
Indication for CS							
Malpresentation in T1	46	51.7	28	31.4	18	20.3	0.731
Severe PE/PIH	15	16.9	12	13.5	3	3.4	0.342
CPD	7	7.9	5	5.7	2	2.2	0.517
APH	5	5.7	3	3.5	2	2.2	0.973
Prolonged PROM	3	3.4	2	2.2	1	1.1	0.859
Eclampsia	2	2.2	2	2.2	0	0	0.083
Previous scar	2	2.2	1	1.1	1	1.1	0.442
Cord prolapse	2	2.2	2	2.2	0	0	0.091
Monoamniotic twin	2	2.2	1	1.1	1	1.1	0.407
Fetal distress	2	2.2	2	2.2	0	0	0.089
IUGR	1	1.1	0	0	1	1.1	0.078
Retained T2	1	1.1	1	1.1	0	0	0.076
TTTS	1	1.1	0	0	1	1.1	0.081

CS: Caesarean section; T1: Leading twin; PE: Preeclampsia; PIH: Pregnancy induced hypertension; CPD: Cephalopelvic disproportion; APH: Antepartum haemorrhage; T2: Second twin; PROM: Pre labour rupture of membranes;

IUGR: Intrauterine growth restriction; TTTS: Twin-twin transfusion syndrome.

**Table 5: Maternal adverse outcomes**

Conception method	Total		Natural		ART		p-value
	N	%	N	%	N	%	
Maternal adverse outcome							
Caesarean section	89	38.4	59	25.4	30	13	0.34
Preterm delivery	69	29.7	38	16.4	31	13.3	0.71
Abnormal lie/presentation	63	27.1	30	13	33	14.1	0.92
Anaemia in pregnancy	24	10.3	14	6	10	4.3	0.94
Hypertensive diseases	20	8.6	8	3.4	12	5.2	0.86
PPH	12	5.2	9	3.9	3	1.3	0.45
APH	5	2.2	3	1.3	2	0.9	0.88
GDM	5	2.2	2	0.9	3	1.3	0.91
PROM	3	1.3	2	0.9	1	0.4	0.63
No complications	126	54.3	90	38.8	36	15.5	0.27

\* Some patients have more than one adverse outcome.

APH: Antepartum haemorrhage; PPH: Primary Postpartum haemorrhage; GDM: Gestational diabetes mellitus; PROM: Preterm rupture of membranes.

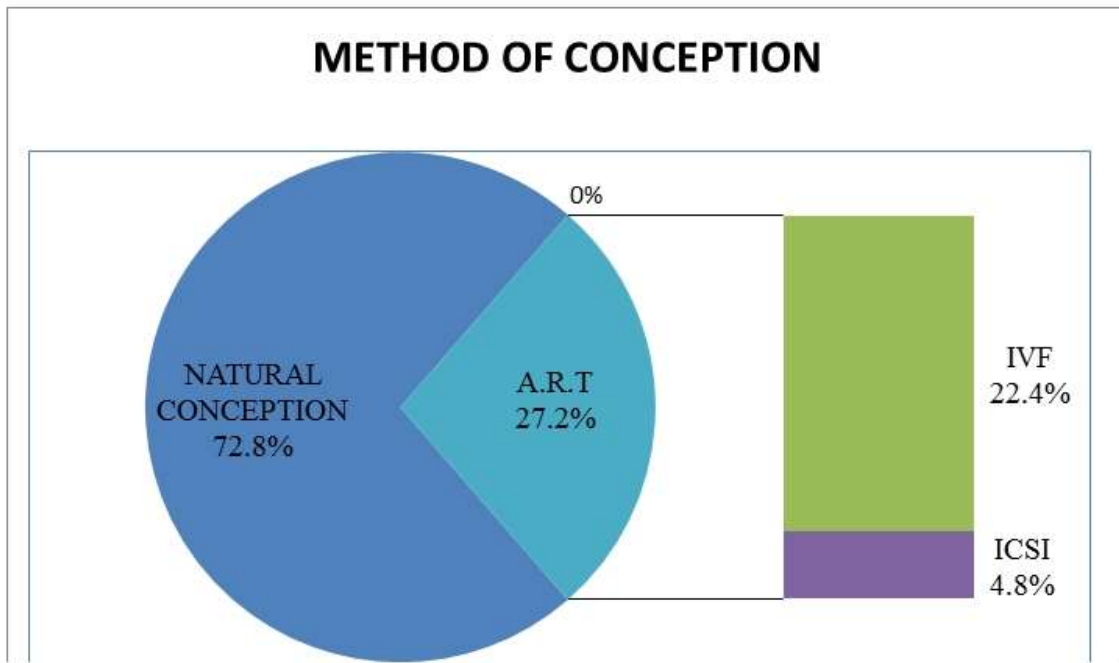


Figure 1: Method of conception

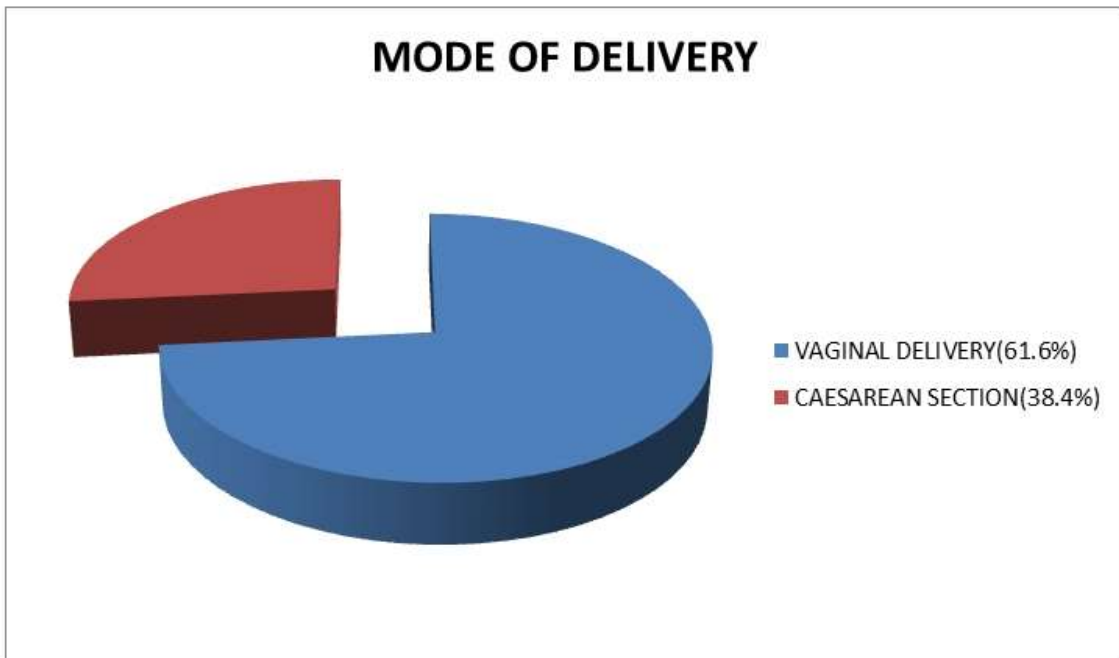


Figure 2: Mode of delivery

## DISCUSSION

The prevalence of twin delivery in the University of Port Harcourt Teaching Hospital (UPTH) for the study period was 33.8 per 1000 deliveries. It was similar to 32.6 per 1000 deliveries reported in Ilorin in 2008,<sup>8</sup> but higher than 16 per 1000 earlier reported in Port Harcourt and

22.9 per 1000 deliveries reported in Kano.<sup>12,15</sup> A similar study in 2004 in south-west Nigeria had a higher prevalence, at 40.2 per 1000 deliveries,<sup>16</sup> probably because the south-western part of Nigeria has the highest twinning rate worldwide.<sup>3</sup> The rise in prevalence recorded in our centre may be attributable to the increasing patronage of assisted reproductive

technologies by clients, which tends to be associated with multi-fetal pregnancies.

The 25 to 29 years age group had the highest number of twin deliveries, which was similar to a study in Ilorin.<sup>8</sup> The mean maternal age was  $28.99 \pm 4.71$  years and was similar to findings in other studies.<sup>12,13</sup> This was attributable to the fact that reproductive potential is at its peak in the given age group, with more women in the study falling into this age group. This naturally led to more of the women in this group having twin pregnancies compared to other age groups. However, other twin pregnancy studies have shown that increasing maternal age influences twinning rate.<sup>17,18</sup>

There was also a progressive increase in the incidence of twinning with increasing maternal parity. The proportion of nulliparous women in the study population was the least (5.6%), and the mean parity was  $2.3 \pm 1.49$ . Grand multiparous women were also few, probably because that status is being discouraged as a result of the general economic downturn in the country, women's career pursuits, increased uptake of family planning services and better health awareness of possible obstetric complications by the general populace. These findings were similar to those of other studies.<sup>12,16</sup>

The incidence of cephalic first twin was high. The cephalic-cephalic combination accounted for more than half of the population studied, as was the case in an Ilorin study where cephalic-cephalic combination was also the commonest.<sup>1</sup> The caesarean section rate of 38.4% was lower when compared to results from similar studies,<sup>12,16,19,21</sup> probably because those studies had a higher proportion of unbooked patients with a higher tendency to develop pregnancy complications which necessitated emergency abdominal deliveries.<sup>12,19</sup> However, the caesarean section rate was higher than the 24.2% reported in south-east Nigeria,<sup>20</sup> probably because of the higher proportion of patients with non-vertex presentation of the first twin in this study. Our centre has a protocol of abdominal deliveries for non-vertex presentation of the first or leading twin; as well as for those with a previous uterine scar that have multiple pregnancies irrespective of the presentation of the leading twin.

Complications found in this study include preterm delivery, malpresentation, hypertensive disorders of pregnancy, anaemia and postpartum haemorrhage. There was no maternal death. These findings were noted in similar studies.<sup>19,21</sup> Our findings suggest that twin pregnancies conceived through IVF/ICSI have comparable maternal outcomes to naturally conceived twin pregnancies as there were no demonstrable statistically significant differences. This was in keeping with other studies in Saudi Arabia, Serbia and China.<sup>13,14,18</sup> This finding may have resulted from more precautions being taken by health care professionals, and the mothers themselves, in both naturally and ART conceived twin pregnancies.

The average gestational age at delivery was 37.4 weeks, which was similar to 37.1 weeks and 36 weeks

reported in Kano and Tanzania respectively.<sup>14,22</sup> Preterm delivery was the commonest maternal complication and is likely to influence neonatal admission as a result of the effects of prematurity on the newborn. The preterm delivery rate was 29.7%, and this was lower than the 37.3% in Tanzania,<sup>22</sup> probably because the Tanzanian study was conducted in a rural area, with likely poorer nutrition and probably less than optimum antenatal care services for their women. However, the effect of prophylactic cervical cerclage procedure commonly done in our environment for women who did IVF/ICSI and had multiple pregnancies was not assessed with regards to the preterm delivery rate in our study.

In conclusion, twin gestations are high risk pregnancies and are associated with a higher risk of obstetric complications and interventions as evidenced by the number of maternal complications, preterm deliveries, and a relatively high caesarean section rate in this study. However, these outcomes were not significantly affected by the method of conception, as all twin pregnancies were managed by senior obstetricians at the UPTH, which is a tertiary health facility. The increased uptake of ART is contributory to the rising prevalence of twinning in our environment. It is recommended that increased fetal and maternal surveillance for complications in twin pregnancy and early appropriate interventions should be encouraged to reduce morbidity and mortality.

## CONFLICT OF INTEREST

There was no conflict of interest.

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