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Original Research Article

The trend of higher-order multiple gestation in a tertiary hospital in South-South Nigeria

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ABSTRACT

Background: Higher-order multiple (HOM) Gestations are pregnancies with three or more fetuses within the uterus at the same time. The advent of assisted reproductive technology (ART) has caused an increase in its occurrence. Prevalence of naturally occurring HOM births is 1-7 per 10,000 deliveries. HOM are associated with adverse obstetric and perinatal outcomes, when compared with singleton births. In Nigeria, ART is gaining ground, after an initial reluctance. The aim of this study was to highlight the adverse obstetric and perinatal outcomes of HOM pregnancies and births in a tertiary hospital.
Methods: This was a retrospective study of 38 HOM pregnancies that delivered at the Rivers State University Teaching Hospital (RSUTH) between January 2019- December 2023. Relevant data was extracted from the patient's hospital records. Data was entered into a pre-designed Proforma. Analysis was done using IBM.SPSS, version 25.
Results: A total of 9,538 deliveries took place within the study period. Two hundred and ninety (3.04%) were twin deliveries. Triplet deliveries were 33(0.35%). Quadruplets were a total of 4 (0.04%) and Quintuplets delivery was 1(0.01%). Prevalence of HOM births from this study was 3.7 per 1,000 deliveries. Complications associated with HOM deliveries for the parturient were anaemia (84.2%) and severe pre-eclampsia (42.12%). Perinatal complications were prematurity (92.12%), low birth weight (91.5%) and respiratory distress syndrome (90%).
Conclusions: There is an upward trend of HOM pregnancies due to ART, and advanced maternal age at conception. Proper antenatal care to prevent anemia, close monitoring of these pregnancies will help improve maternal and perinatal outcomes from HOM births.

Keywords: Assisted reproductive technology, Higher-order multiple pregnancies

INTRODUCTION

Higher-order multiple gestations are multiple pregnancies with three or more fetuses. These were rare in the past, but are now seen more frequently because of Assisted Reproductive Technology (ART) as methods of treating infertility, and advanced maternal age at conception.[1,2] Previous studies have shown that women above thirty-five years(>35yrs) can shed more than one ovum in one menstrual cycle, increasing the chances of HOM pregnancies.[4,5]

Parity, maternal age, race, family history, nutritional status, pre gravid weight, body mass index, have all been identified as risk factors for multiple gestations.

Because of insufficient number of naturally occurring higher-order multiple gestations, studies have only compared twins and singletons.

In specific populations such as the Yoruba tribe in Nigeria, twin and higher-order gestations occur commonly, and it has been proposed that dietary factors may act as natural ovulation-induction substances, thus generating superovulation.[2,3] Prevalence of naturally occurring HOM world-wide is 1-7 per 10,000 deliveries.

In Nigeria, like other developing countries, ART is gaining ground, after an initial reluctance. Delay in gaining approval was because of inadequate infrastructure, high-cost implications, epileptic power supply, some cultural beliefs in certain regions that multiple births were abnormal and should not be accepted.[8,9]

In current practice, most nulliparous women with infertility problems and advanced maternal age, resort to Assisted Reproductive Technology (especially IVF) in their desperate bid to have children. This has led to high prevalence of HOM pregnancies among the nullipara. This study was aimed at highlighting the trend of higher-order multiple gestations in Rivers State University Teaching Hospital and their associated adverse maternal and perinatal outcomes.

METHODS

Study design and population

This was a retrospective study of all the women who had HOM pregnancies and deliveries in our facility between January 2019-December 2023.

Study place

This study was done at the Rivers State University Teaching Hospital (RSUTH), Port-Harcourt, Nigeria. The hospital is a tertiary center and serves as a referral center for neighboring health facilities. It provides antenatal and delivery services for women. The hospital has qualified teams of Obstetricians, Pediatricians and Anesthetists, availability of blood bank services and Special Care Baby Unit (SCBU) for at risk neonates. There is an average annual delivery of about 1,907 births

Inclusion criteria

Inclusion criteria were the pregnant women with higher order multiple gestations (triplets, quadruplets, quintuplets, etc.) who registered for ANC or delivered in our facility.

Exclusion criteria

Women with singleton pregnancies and twin pregnancies were excluded.

Data collection

Relevant data was extracted from the patient's case reports, antenatal and post-natal records, labour ward and theatre records and entered into a pre-designed proforma. Analysis was done using IBM Statistical Product and Service Solution (SPSS) Version 25.0 (NY, Armonk).

Statistical analysis

Results were presented in frequencies and percentages for categorical variables, mean and Standard Deviation for continuous variables. P-value 0.05.

RESULTS

A total of 9,538 deliveries were conducted in this facility within the 5-year period. Two hundred and ninety (290) were twin deliveries (3.04%). Higher-order multiples were triplets 33 (0.35%), quadruplets were 4 (0.04%), quintuplets' delivery was 1 (0.01%). Table 1 shows the prevalence and trends of HOM pregnancies. Prevalence of HOM deliveries was 3.7 per 1,000 deliveries.

The mean age of women with HOM pregnancies was 36-40yrs. Parity of women who had HOM pregnancy was highest amongst nullipara. More than 50% were educated, as shown in Table 2. Most of the women were Christians (>70%). Majority were business women (36.84%), see Figure 1.

The mode of conception was ART in 79% (Figure 2), while mode of delivery was CS in 95% (Figure 3).

Table 3 reveals the maternal complications. Highest maternal complication was anaemia in pregnancy (84.21%) and severe pre-eclampsia (42.12%). Highest perinatal complications were prematurity (92.12%), low birth weight (91.66%) and respiratory distress syndrome.

Table 5 shows the neonatal characteristics, with the birth weight range of the Triplets as 1.9-2kg and quadruplets as 1.5-1.9kg.

Table 1: Number of deliveries (n=9538).

Year	2019	2020	2021	2022	2023	Total birth	Percentage
Singleton	1,810	2,098	1,869	1,744	1,719	9240	96.875
Twins	71	25	71	70	53	290	3.04
Triplets	6	4	2	13	8	33	0.365
Quadruplets	1	1	0	1	1	4	0.04
Quintuplets	0	0	0	0	1	1	0.01

Table 2: Sociodemographic characteristic of study participant.

Variables	Number of women	Percentage
Age group (years)		
26-30	8	21.05
31-35	4	10.53
36-40	10	26.32
>40	16	42.12
Mean	SD	95%CI
37.5	6.2	35.51,39.43
Parity		
0	17	44.74
1	8	21.05
2	5	13.16
3	4	10.53
Educational status		
No formal education	2	5.26
Primary	2	5.26
Secondary	10	26.32
Tertiary	19	50.0%
Religion		
Christianity	28	73.68
Islam	7	18.42
Atheist	3	7.89

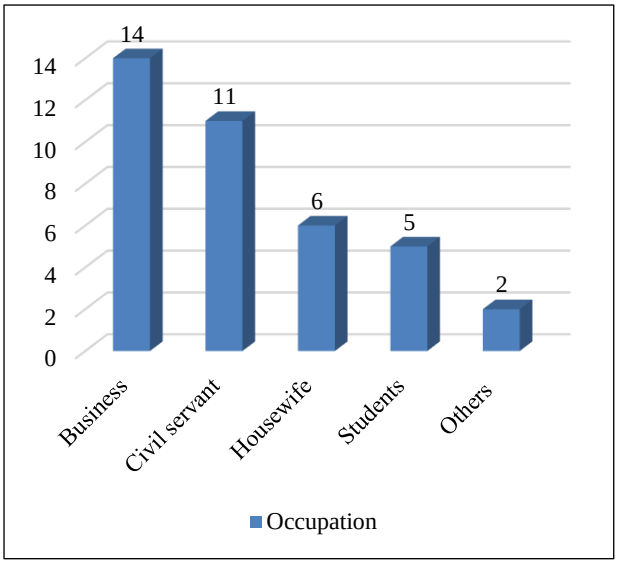

Figure 1: Occupation of study participants.

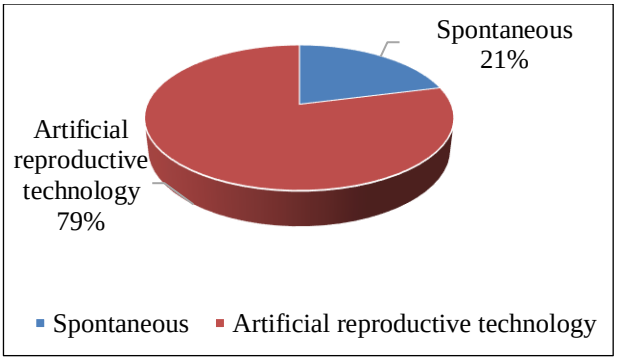

Figure 2: Mode of conception.

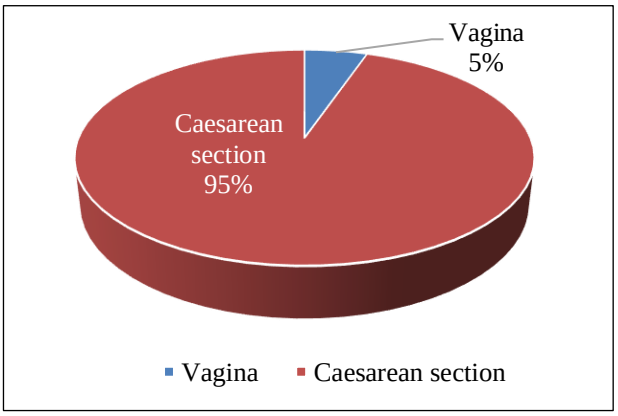

Figure 3: Mode of delivery.

Table 3: Maternal complication (n=38).

Complication	Number	Percentage
Anaemia	32	84.21
Pre-eclampsia/server pre-eclampsia	16	42.12
Placenta previa	8	21.05
Preterm premature rupture of membrane	32	84.21
Hyperemesis gravidarum	22	57.89

Table 4: Neonatal complications (n=120).

Neonatal complications	Number	Percentage
Preterm birth	32	92.12
Low birth weight	110	91.66
Respiratory distress syndrome	108	90

Table 5: Neonatal characteristic.

Higher order multiple births	Number of women	Number of babies	Gestational age at delivery	Live birth	Perinatal deaths	Average birth weight (Kg)
Triplets	33	99	33-37	95	4	1.9-2 kg
Quadruplets	4	16	32-34	14	2	1.5-1.9 kg
Quintuplets	1	5	26	5	5	0.6 kg

DISCUSSION

The prevalence of HOM gestation from this study was 3.7 per 1000 deliveries. This is comparable to a previous study done in 2021 by Oriji et al where the prevalence of HOM deliveries was 3.5 per 1000 births. Spontaneous occurrence of triplets and higher-order gestations

Noted in USA was 1in 7,925 triplets and 1 in 600,000 quadruplets.[2] Prevalence of naturally occurring HOM is 1-7 per 10,000 deliveries world-wide, even in Nigeria noted to have the highest twinning rate worldwide. An earlier study, Patricia Akintan 2017, noted a prevalence of 0.75%.

With the advent of ART, prevalence of HOM is on the increase.

In countries where ART is used with regularity like United States, England, Australia, New Zealand and Japan, there are review articles showing increased numbers of higher-order gestations.[15]

The age of women with highest percentage of HOM pregnancies (42.12%) were above 40years. This can be explained by women of this age group being desperate to have children by all means, including ART.

Also, they do not accept fetal reduction after ART and are ready to carry as many fetuses that are viable.

Nulliparous women were highest for similar reasons as above.

The mode of conception of most women with HOM pregnancy was ART (78.95%). Caesarean section was the highest mode of delivery (94.74%), due to abnormal lie and presentation of the fetuses., placenta previa, severe pre-eclampsia with unfavorable cervix, preterm premature rupture of membranes and other indications for caesarean delivery.

Average gestational age at delivery was 33-34weeks. This is consistent with earlier studies.[2-5]

Higher-order multiple gestations remain 5-10 times higher risk of complications than do singletons.[1,3-5]

The commonest maternal complication of HOM was anaemia (<30g/dl), due to increased iron demand.

The prevalence of anaemia in pregnancy in Nigeria is 25-45.6%. So many women in developing countries enter pregnancy in anaemic state, even with singleton pregnancy. The increased demand on the iron reserves of the mother from the larger placenta and for erythropoiesis from three or more fetuses makes the woman to be at high risk of anaemia.[8]

The women were also not well motivated by their care givers to improve their nutritional status and double their routine haematinics.

Other maternal complications were pre-eclampsia (42.12%), placenta previa, because of the large placental base (21.05%), Preterm pre-labour rupture of membranes (PROM). This can be explained by the over distension of the uterus with increasing gestational age.

Hyperemesis gravidarum was due to elevated amounts of human chorionic gonadotrophin in these pregnancies, especially in the first trimester.

Caesarean section was the major mode of delivery (94.74%) as earlier explained. The only possible exception is a triplet gestation, with all fetuses in vertex presentation.[1]

Primary Post Partum Heamorhage (PPH) was not a significant maternal complication in our center as noted in other studies.[3-5] This was because a purse string suture procedure, was done during caesarean section to prevent primary post-partum haemorhage for predisposed patients.[14]

The emotional, financial and physical impact of caring for three or more children at the same stage of development, can have negative effect on the woman and her entire family.

Perinatal complications were mostly due to prematurity. Preterm births were seen in 92.12%, low birth weight in 91.66%, Respiratory distress syndrome was evident in 90% of the newborns. These were similar findings in other studies.[1-6] Perinatal mortality was 9.17%.

Limitations of this study were that this study was only limited to a tertiary institution, so may not give an accurate result of the prevalence of HOM in the entire population. Also, the infants born from these HOM pregnancies were not followed-up long enough (6months-1year).

CONCLUSION

There is an upward trend of HOM pregnancies, due to ART as treatment for infertility and advanced maternal age at conception, due to carrier pursuits and academic enhancement of our women.

Proper antenatal care and close monitoring of these pregnancies will help to improve maternal and perinatal outcomes from HOM births.

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