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RESEARCH ARTICLE

Maternal and neonatal outcomes in twin pregnancy at a tertiary care center

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ABSTRACT

Background: Multiple gestations are on the increase globally due to several factors, the most important being the use of assisted reproductive technology (ART). Multiple pregnancy has substantially higher risk of fetal morbidity and mortality compared to singleton pregnancies. Twin pregnancies constitute 2 to 4% of total number of births. Perinatal mortality rates are four fold higher for twins than for singletons. Twin gestations are at increased risk of a variety of pregnancy complications, which can be minimized by antepartum diagnosis and management. Objective of the study is to evaluate maternal and neonatal outcomes associated with twin pregnancies in a tertiary care center of Tamil Nadu. **Methods:** This observational study was conducted in the Department of Obstetrics and Gynecology from the period of January 2021 to December 2021. The study included 50 women with twin pregnancies with gestational age of 28 weeks or more. Maternal and neonatal outcomes were studied. **Results:** Incidence of twin pregnancy was found to be 2.08%. Twins were more in multigravida (78%) as compared to primigravida (22%), with maximum incidence between the age group of 20 to 29 years. Maximum (72%) women delivered between the gestational age 29 to 37 weeks. Most common fetal presentation was vertex -vertex presentation (54%). The most common maternal complication in twin pregnancy was preterm labour (48%), followed by anemia in 34% women and hypertensive disorders (30%) and gestational diabetes mellitus (30%). Most common mode of delivery was by caesarean section (72%) and most common indication being malpresentation. Most common perinatal complication was prematurity (52%), followed by respiratory distress (46%), fetal growth restriction (20%), hyperbilirubinemia (11%) and neonatal sepsis (10%). NICU admissions were 62%. There was no maternal mortality reported in this study and 1% perinatal mortality in NICU admitted neonates. **Conclusion:** Twin pregnancies are associated with significant maternal and perinatal risks, especially for the second twin. Early diagnosis is important for proper counseling and timely management so as to optimize maternal and perinatal outcome.

Keywords: Fetal outcome, maternal outcome, multiple pregnancy, assisted reproduction.

Multiple pregnancy occurs because of the in utero development of two or more fetuses at the same time. Multiple pregnancies are associated with increased risk to both the mother and fetuses and this risk increases with the number of fetuses [1]. Though the incidence rate appears to be variable, multiple pregnancies account for 3 to 4 % of births globally. Twin pregnancy is one of the major challenges faced by obstetricians [2]. Sub-Saharan Africa has the highest incidence of multiple pregnancy, with an average twinning rate of 20 per 1,000 deliveries whereas it is 10 per 1,000 deliveries in Europe and about 5-6 per 1,000 deliveries in Asia [1, 3]. Complex interaction between various genetic and environmental determinants like maternal obesity, age, multiparity, family history, race and other social factors results in twin pregnancy and occurs in 2 to 4 of live births [4]. These rates of multiple pregnancies have a direct effect on the rates of preterm deliveries and its associated complications. The risks of congenital malformations are

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also high with multifetal pregnancies. The incidence of multiple pregnancy had raised by more than 70% over the last three decades due to the emergence of various infertility treatment modalities [5]. Women's desire to give birth to more than one baby and transfer of multiple embryos to achieve higher live births has lead to increase in twin pregnancy rates. Above 20% of pregnancies that resulted from assisted reproductive techniques are multiple pregnancies [6].

There is significant variation in the incidence of multiple pregnancies among populations of different countries, due to variations in the frequencies of dizygotic twinning. The increase in the levels of follicle stimulating hormone in multiple ovulation results in dizygotic twins. Monozygotic twinning rate is relatively constant [7]. The outcome of monozygotic twinning process depends on when the division occurs. Among twin pregnancies, monochorionic (MC) twins have worse pregnancy outcomes compared to dichorionic (DC) twins, irrespective of the mode of conception. Also, the perinatal outcome is worse in monochorionic twins conceived through assisted reproductive techniques when compared with monochorionic twins conceived spontaneously [8]. Some vascular anastomotic connections are likely to exist in all monochorionic placentas. The anastomosis may be artery-to-artery, artery-to-vein or vein-to-vein and whether the anastomoses are dangerous to either twins depends on the degree to which they are hemodynamically balanced. The resulting chronic feto-fetal circulation may lead to complications that are unique to monochorionic twins such as twin to twin transfusion syndrome (TTTS) and twin anemia-polycythemia sequence (TAPS). These explain the increased risk of perinatal morbidity and mortality in monochorionic twins compared with dichorionic pregnancy [9]. Discordant growth of twin fetuses with restricted growth of one twin fetus often termed selective fetal growth restriction occurs in 10-15% of monochorionic twin gestations and represents challenges in the management [10]. Studies has shown that growth is lower in DC twins from 30 weeks of gestation compared to singleton pregnancies and growth of MC twins is smaller when compared to both singleton and DC twins, throughout the gestation [11]. Around 60% of twins will deliver spontaneously before 37^{+0} weeks of gestation [12]. Congenital malformations, low-birth weight, birth asphyxia, intrauterine fetal death are few reasons for high mortality, contributing to increased perinatal complications such as post-partum hemorrhage, preeclampsia and preterm birth [13].

Standardization of the criteria for diagnosis, improving the monitoring and management protocols and proper reporting of the outcome are likely to reduce the perinatal risks [14]. The aim of the study is to determine the burden of twin pregnancies and to assess the maternal complications and fetal outcome associated with twin pregnancies.

Materials and methods

The study was done after getting approval from the institutional ethics committee. This prospective observational study was carried out in the department of obstetrics and gynecology of the hospital for duration of one year, between January 2021 to December 2021. The procedure followed in this study meets the tenets of declaration of Helsinki.

During this study period, 2402 deliveries were conducted in total, out of which 50 were twin pregnancies. The study included all women with twin pregnancy whose gestational age was 28 weeks and above, who were admitted and delivered in the hospital. Higher order multi fetal pregnancies (triplets and quadruplets) and singletons were excluded. Informed consent was taken from the women who participated in the study. Detailed history of the patients and complaints if any, were noted. History of spontaneous conception, treatment for ovulation induction or in vitro fertilization was asked. History of multiple gestations in the family and detailed obstetric history was recorded. General physical examination, per abdominal and per vaginal and other systemic examinations were carried out. Necessary investigations were done. Obstetric complications such as gestational hypertension, preterm rupture of membranes (PROM), preterm labour, gestational diabetes mellitus, anemia, hypothyroidism, antepartum hemorrhage was recorded. Gestational age at birth, mode of delivery and its indication, inter-delivery interval between the first and second twin, APGAR scores and birth weights of both the babies were recorded. Placenta was examined to determine the chorionicity. Twins, who required NICU admissions were followed up. Continuous postnatal monitoring was also implemented.

All relevant data were entered in MS Excel and analyzed statistically by simple proportions.

Results

During the one year study period, total of 2402 deliveries were conducted, out of which the number of twin deliveries were 50, thus giving an incidence of 2.08%. Mean maternal age of the women with twin pregnancies in our study was 26.6 ± 1.8 years. Fifty eight percent cases were booked, 22%

cases were unbooked and 20% were referred from peripheral health centers. Majority (60%) were in the age group of 20 - 29 years as seen in table 1. Among the 50 women, 39 (78%) were multigravida and 11(22%) were primigravida. Most of them (65%) belonged to upper and middle socio-economic status and 35% belonged to lower socio - economic status. Mean gestational age at delivery was 34.4 weeks. Mean birth weight of the first born twin was 1.98 ± 0.54 kg and the second twin was 1.7± 0.47 kg.

Table 1: Demography and obstetric characteristics

Age (years)	Number	Percentage
<20	2	4%
≤ 20 -29	30	60%
≥ 30	18	36%
Total	50	100
Parity		
Primipara	11	22%
Multipara	39	78%
Gestational age (weeks)		
≤ 28	5	10
29 - 36	36	72
≥ 37	9	18
Total	50	100

Most common cause of twinning as per our study was conception through assisted reproductive techniques (14%) and history of intake of ovulation induction drugs in 11%. Family history of twinning was found in 6% and no cause was detected in 69%. With respect to chorionicity, most of them were dichorionic (66%). Fourteen percent were monochorionic diamniotic, and 6% were monochorionic monoamniotic. Chorionicity was not identified in 14%.

Table 2: Maternal complications encountered among patients

Complications	Number	Percentage
Preterm labour	24	48
Anemia	17	34
Hypertensive disorders	15	30
Gestational diabetes	15	30
Polyhydramnios	8	16
APH	5	10
UTI	6	12
Hypothyroidism	3	6
Hyperemesis gravidarum	14	28
PPH	2	4
No associated complications	6	12

Note: Total percentage will not be equal to 100%, as some patients had more than one complications.

Commonest presentation observed in our study was vertex - vertex presentation (54%) as mentioned in table 3, followed by vertex -breech presentation (18%). Thirty six (72%) women delivered through caesarean section, whereas 11(22%) delivered vaginally and 3(6%) had operative vaginal delivery. Abnormal presentation (38.8%) was the most common indication for performing caesarean section followed by fetal distress (27.7%), antepartum hemorrhage (13.8%), severe pre-eclampsia (11.1%) and non progression of labour (8.3%).

Table 3: Distribution of cases according to fetal presentation

Presentation	Number	Percentage
Vertex-vertex	27	54
Vertex- breech	9	18
Vertex transverse	6	12
Breech vertex	5	10
Breech-breech	2	4
Breech-transverse	1	2

Most common maternal complication that was observed in our study was preterm labour (48%), followed by anemia in 34% cases, and hypertensive disorders in 30% and gestational diabetes in 30% cases (table 2). The other complications were antepartum hemorrhage (10%), UTI (12%), hypothyroidism (6%), hyperemesis gravidarum (28%), polyhydramnios (16%) and postpartum hemorrhage (4%).

Table 4: Neonatal outcome

Parameter	Number	Percentage (%)
Live births	99	99
NICU admissions	62	62
Single intrauterine fetal demise	1	1
Neonatal death at 1st week	1	1

The predominant cause of perinatal morbidity was prematurity (52%), respiratory distress (46%), followed by fetal growth restriction (20%), hyperbilirubinemia (11%) and neonatal sepsis (10%). Among 100 babies, 68% had APGAR score below 7 at 1 minute and 32% had APGAR score above 7 at 10 minutes. There was one intrauterine fetal demise. 62 babies needed NICU admissions and out of these one baby died after one week owing to complications.

Discussion

Twin pregnancies require specialized care and multidisciplinary approach towards their management, as the associated risks are higher in both mother and fetuses.

The incidence of twin pregnancy in our study was reported to be 2.08%, which is similar to the incidence of 2% reported by Mehta CV et al in a study conducted from Ahmadabad [15]. The mean age of the mothers in our study was 26.6 years, which is similar to the findings reported by Upreti P et al [7] . In a study by Zanjade TS et al [16], the mean maternal age was 29.45 ± 4.01 years, which was higher when compared to our findings. The differences were mainly because of the differences in the age at which they were

married and varying time of undertaking fertility treatments. Majority of the mothers in our study were between the age group of 20-29 years, consistent to the study by Bhalla S et al [3].

Seventy eight percent women with twin pregnancies in this study were multipara. Our findings were similar to the findings of Dubey S et al [17] which also shows that higher frequencies of twin pregnancies among multipara. Majority of the twin gestations in our study were a result of spontaneous conception (75%) followed by conception through induction of ovulation and assisted reproductive techniques. Similar results were noted in a study by Jayaraj L and Remani PS [18]. Fetal presentation that was commonly noted in our study was vertex-vertex presentation (54%) consistent with the finding by Lawal AM et al.[19]

In the present study, cesarean section was the mode of delivery in 72% women, and the commonest indication being abnormal presentation (38.8%). Similar findings were derived in studies conducted by Ajmi A et al [20] and Dougan C et al [21] where malpresentations were stated as the indication of cesarean sections. But in contrary, Schachter-Safrai N et al [22], in his study has stated that 88.3% women had underwent normal vaginal delivery, whereas only 7.1% underwent cesarean section and 4.6% had combined vaginal - cesarean delivery.

The commonest maternal complication observed in this study was preterm labour seen in 48%. Similarly, Seth S et al, [23] have also stated preterm labour to be the commonest maternal complication with the incidence of 60%. Anemia was the second most common complication, which was seen in 34% of women. Study by Sahu B et al [1] and Rami BD et al [24] also had the similar results, with an incidence of anemia in 29.9%. However a much higher incidence of anemia was found by Bhalla S et al [3] and Rani PS et al [25]. The reason for anemia is mainly because of the increased demand in twin pregnancy resulting in iron, vitamin B12, folic acid and physiological anemia.[24] Incidence of gestational diabetes mellitus and gestational hypertension was 30% in our study. The significant increase in the incidence of pre-eclampsia and GDM has been demonstrated in a study by Rissanen et al [26]. Obesity, advanced maternal age and also meticulous testing in twin pregnancies are found to be the reasons for increased incidence. Four percent of the women in our study had post-partum hemorrhage but higher incidence (10%) has been reported in a study by Oraekwe OI [27], resulting in anemia, which was found to be the most common post partum complication.

The incidence of APGAR score of <7 at 1 minute was recorded in 68%. Of this, the incidence among twin A was 42.7% and among twin B was 57.3%, consistent with the findings of Bhalla S et al [3] indicating that low APGAR score to be more common in the second twin compared to the first. Similar findings were reported in another study by Singh S et al [28] where 62% of second twins and 34% of first twins had poor APGAR score of <7. Sixty two percent of the neonates, in our study required neonatal admissions owing to neonatal morbidity similar to the results obtained by Rani PS et al [25]. The cause for this increase in the rate of NICU admissions are prematurity and perinatal asphyxia as stated by Oriji PC et al [29]. Inspite of advances in obstetrics and neonatology, perinatal mortality is alarmingly high.

Conclusion

The advancements in assisted reproductive technology and its increased usage had lead to increase in the incidence of twin pregnancies in the recent years. Twin pregnancy has significant risk of maternal and neonatal complications, especially preterm delivery that increases neonatal morbidity and mortality. Obstetric risks had increased due to the increase in the rates of cesarean sections and preterm deliveries. Enhanced antenatal care, close perinatal assessment, planned delivery and better NICU facilities for the preterm babies can bring about a significant reduction in perinatal morbidity and mortality and improve the maternal and fetal outcomes in twin pregnancies.

Conflict of interest: None. **Disclaimer:** Nil.

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