

A Retrospective Study of Maternal and Fetal Outcomes of Twin Pregnancy

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This study was aimed to study the prevalence of twin pregnancy in a tertiary care hospital in Karad and to evaluate the various factors that influence maternal, fetal, and neonatal outcomes of twin gestation. This retrospective study was conducted at a tertiary care hospital in Karad, Maharashtra, for a period of two years. All women admitted with twin pregnancy (>28 weeks gestation) were considered for study. Maternal data including age, gestational age, parity, mode of conception, maternal interventions, mode of delivery, fetal death, intrauterine fetal growth restriction (IUGR), twin to twin transfusion, neonatal intensive care unit (NICU) admissions, birth asphyxia, low birth weight (LBW) and respiratory distress were recorded and analyzed. Incidence rate of twin pregnancy was 1.9%. Most women (56.48%) were aged 21-30 years and have completed 34-36 weeks of gestation (48.15%) with average gestational age of 34.97 ± 2.35 weeks. Malpresentations (37.96%) followed by preterm labour (35.1%) was most common maternal complication. Cesarean section (62.04%) was most frequent mode of delivery. Most neonates had LBW (92.34%) and required NICU admissions (19.6%). Total rate of neonatal mortality is 3.34%. Birth asphyxia (42.85%) was the most frequent cause of neonatal mortality. Twin gestation necessitates special attention as there is increased risk of maternal and perinatal morbidity and mortality. Early detection and anticipation of complications of twin gestation can greatly improve the maternal and fetal outcomes.

Keywords: Cesarean section; Gestational age; Infant; Low birth weight; Obstetric labor.

Globally, in the last two decades, with advances in assisted reproductive technology (ART), older maternal age and widespread use of ovulation inducers, the incidence of twin gestation has witnessed a steep increase¹. In India, the occurrence of twin gestation is approximately 1% of all gestations but accounts for 10% of perinatal mortality. There is 2.5-fold increased risk of maternal mortality in twin gestation than in singleton pregnancies². The incidence of twins varies with ethnicity and geographical distribution³.

Twin gestation has increased risk of maternal and fetal morbidity and mortality. The maternal complications commonly observed in twin gestation are anemia, gestational diabetes mellitus (GDM), pre-eclampsia, pregnancy induced hypertension, antepartum hemorrhage, preterm labor, premature rupture of membrane (PROM), placental abruption and polyhydramnios. The combination of increased plasma volume, anemia and hypertensive disorders during pregnancy contributes to the risk of pulmonary edema, which

further leads to maternal morbidity and mortality⁴. Consequently, these complications account for repeated antenatal admissions, longer hospital stays and blood transfusions⁵.

The main causes of adverse neonatal outcomes in multiple pregnancies are related to low birth weight (LBW), intrauterine fetal demise (IUD), intrauterine growth restriction (IUGR), twin transfusion syndrome (TTTS), congenital malformations, birth asphyxia and neonatal death⁶. All these factors contribute to higher perinatal complications observed in multifetal gestations which is five to six times greater compared to singleton pregnancy⁷.

In India, there is disparity in the prevalence of twin pregnancy and their complications reported in the literature^{8,9,10}. Considering the difference in incidence of twin pregnancies, this study was undertaken to study the prevalence of twins, to examine the high-risk factors associated with twin pregnancies and also to determine the maternal and fetal outcomes in twin gestations.

MATERIALS AND METHODS

Study design

This observational retrospective study was carried out at the Department of Obstetrics and Gynaecology in a tertiary care hospital, Karad, Maharashtra, extended over a period of two years from October 2016 to October 2018. Ethical clearance was obtained by the Institutional Ethical Committee. The study population considered in our study was women admitted with twin pregnancy.

Selection criteria

Inclusion criteria included all women admitted during antenatal period or during labor with twin gestation after 28 weeks gestation. Women with gestational age less than 28 weeks and with chronic medical illness namely diabetes mellitus, chronic obstructive pulmonary disease (COPD), bronchial asthma and coronary artery diseases were excluded from the study.

Data collection

Using a pre-designed structured proforma, data on maternal and neonatal data were collected from the labor room delivery data entry register and detailed information related to mode of delivery and neonatal outcome was gathered from hospital records. Maternal data consists of maternal age,

duration of pregnancy (gestational age), parity, mode of conception, maternal interventions and mode of delivery. Fetal data consisted of fetal death, IUGR, twin to twin transfusion, NICU admissions, birth asphyxia (indexed by Apgar scores of <7 at one minute and five minutes), LBW, septicemia, respiratory distress. Early neonatal deaths occurring after discharge were not captured in the dataset.

Definitions

Gestational age was calculated from the first day of the last menstrual period (LMP) and the date of delivery expressed in weeks. Preterm labor was determined as onset of labor less than 37 weeks of gestation. IUGR was determined as below the 10th percentile for gestational age using an ultrasound. LBW was defined as birth weight < 2500 g and very low birth weight was defined as less than 1500 g.

Capsule

Twin pregnancy is associated with increased risk of maternal and fetal morbidity and mortality. Early detection and anticipation of complications of twin gestation can greatly improve maternal and fetal outcomes.

Statistical analysis

Data related to the maternal and fetal outcomes were analyzed by R software and was presented in percentages and mean \pm standard deviation.

RESULTS

Out of 5492 deliveries 108 (1.9%) subjects had twin gestation. The distribution of maternal demographic data is shown in Table 1. Large numbers of women (56.48%) with twin gestation were between 21-30 years of age. The average age is 29.11 \pm 4.68 years. Twin gestation was observed most in multiparous women (51.85%). Most women have completed 34-36 weeks of gestation (48.15%) with average gestational age of 34.97 \pm 2.35 weeks.

Malpresentations (37.96%) followed by preterm labor (35.1%) was the most common maternal complication in this study. Interventions such as antenatal corticosteroids and cervical cerclage were performed during the antenatal period. 16 pregnancies (14.8%) were conceived by ART and the rest were conceived spontaneously

(85.2%). Cesarean section (62.04%) was the most frequent mode of delivery.

Fetal complications associated with twin gestation are mentioned in the Table 3. One fetal death (37.5%) in twin pregnancy was the most common complication compared to both fetal death. Most neonates had LBW (92.34%) and required NICU admissions (19.6%). Neonatal mortality in this study was due to birth asphyxia, septicemia, pulmonary hemorrhage and disseminated intravascular coagulation (DIC) listed

in the table below. Among this, birth asphyxia (42.85%) was the most frequent cause of neonatal mortality. The total rate of neonatal mortality is 3.34%.

DISCUSSION

There is substantial difference in the prevalence rate of twin gestations and their complications observed throughout the years. Despite the advancements in obstetric care, twin gestation is still a high-risk pregnancy. Hence, this research was aimed to study the prevalence of twins and examine the high-risk factors associated with twin pregnancies.

The incidence rate of twinning was 1.9% in this study. This is complying with the incidence rate (1.9%) reported by Upreti *et al.*⁹ and but contradicting with Smitha *et al.*¹¹ (1.64%). The high incidence of twin pregnancy in this study could be due to increased use of ART and also referral of cases to this tertiary care centre for better management. The distribution of age shows most women had twin gestations in their twenties. The number of primigravida and multigravida with twin gestation were almost equal in this study, similar

Table 1. Maternal demographic data

Variables	Number (n=108) (%)
Maternal age (years)	
≤20	2 (1.85)
21-30	61 (56.48)
≥31	45 (41.67)
Parity	
Primipara	52 (48.15)
Multipara	56 (51.85)
Gestational age (weeks)	
≤33	30 (27.78)
34-36	52 (48.15)
≥37	26 (24.07)

Table 2. Antepartum complications and interventions during pregnancy

Variable	Number (n=108) (%)
Maternal complications	
Anemia	11 (10.19)
Pre-eclampsia	34 (31.48)
Polyhydramnios	4 (3.7)
Malpresentations	41 (37.96)
PROM	9 (8.3)
Preterm labor	38 (35.1)
Interventions	
Antenatal steroids	12 (11.11)
Cerclage	7 (6.48)
Mode of conception	
Spontaneous	92 (85.2)
ART	16 (14.8)
Mode of delivery	
Vaginal delivery	34 (31.48)
Assisted vaginal delivery	7 (6.48)
C-section	67 (62.04)

ART- Assisted reproductive technology, C- Cesarean, PROM- Premature rupture of membrane

Table 3. Foetal complications of pregnancy

Variables	Number (n=209) (%)
Fetal complications	
One fetal death	3 (37.5)
Both fetal death	2 (25)
IUGR (any fetus)	2 (25)
Twin to twin transfusion	1 (12.5)
Anomalies (any fetus)	0
Neonatal outcomes	
NICU admissions	41 (19.6)
Birth asphyxia	6 (2.87)
LBW	193 (92.34)
Septicemia	16 (7.65)
RDS	15 (7.17)
Neonatal mortality	
Birth asphyxia	3 (42.85)
Septicemia	1 (14.28)
Pulmonary hemorrhage	2 (28.57)
DIC	1 (14.28)

IUGR- Intrauterine growth restriction, NICU- Neonatal intensive care unit, LBW- Low birth weight, RDS- Respiratory distress syndrome, DIC-Disseminated intravascular coagulation

to Bangal *et al.*⁷. The mean gestational age in this study is similar to a study by Vanaja *et al.*¹² with 35 weeks.

Intrapartum management of twin gestation is greatly determined by their presentation in labor¹³. The most frequent maternal complication in this study seemed to be malpresentation at delivery. Sarojini *et al.*¹⁴ have observed 42.7% of patients had malpresentation which is comparable to our study. Malpresentation affects the mode of delivery and the outcome of pregnancy¹⁵. As for the other complications, preterm labor rate is 35.1%. Preterm delivery is one of the most pressing problems that leads to perinatal morbidity and mortality in obstetric practice¹⁶. For those patients who were at a risk of delivering before 34 weeks of gestation were given antenatal steroids. An increased incidence of twin gestation in recent years exists due to ART. In this study, ART was reported to be responsible for 14.8% of twin gestation. Dubey *et al.*¹⁷ have observed a rate of 13.4% of twin gestation due to ART.

There is a rising trend in cesarean section in twin gestation over the last decade¹⁸. The rate of cesarean section in this study was also high at 62.04%. This is consistent with Chaudary *et al.*¹⁹ who reported cesarean section rate of 67.4%. On the contrary, Arora *et al.*²⁰ reported cesarean section rate of 20.32% which is much lower than our study. The reason for high rate of cesarean section in this study is due to malpresentation and fetal distress.

The ratio of one fetal death to both fetal deaths is 3:2. One fetal death was more common in the current study. The incidence of LBW was higher in this study. The increased LBW could be due to poor maternal nutritional status and younger age²¹. The neonatal mortality rate reported in this study is 3.34%, which is due to various factors like birth asphyxia, septicemia, pulmonary hemorrhage and DIC. Birth asphyxia (42.85%) was the most common reason for neonatal deaths. However, this is higher when compared to Sheela *et al.*²² who reported rate of birth asphyxia of 13.3%. NICU admissions were required in 19.6% of the neonates due to LBW and prematurity. This is in contrast with Nandmer *et al.*²³ who reported much higher rate of NICU admission (50%).

The findings of the study highlight the necessity of appropriate treatment protocols for counselling, routine antenatal check-ups,

early maternal admission and appropriate care throughout intrapartum and immediate postpartum periods.

However, there were a few limitations in this study such as there were no information regarding the chorionicity of the pregnancy which could be linked to perinatal outcomes and early neonatal deaths occurring after discharge were not captured in the dataset.

CONCLUSION

Twin gestation necessitates special attention as they contribute to maternal and fetal morbidity and mortality. Regardless of its simplicity and limitations, this research adds to the existing literature by providing the Indian data findings on the prevalence of twin pregnancy and maternal and fetal outcomes in twin gestation. Further studies on the subject would be appropriated, particularly to determine whether specialized obstetric and neonatal care would mitigate the incidence of certain complications and thus enhance maternal and perinatal outcomes.

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Conflict of interest

Authors have no conflict of interests.

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