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A PROSPECTIVE STUDY OF MATERNAL COMPLICATIONS AND PERINATAL OUTCOME IN TWIN GESTATION

Obstetrics & Gynaecology

Dr. Rupali Salve Junior Resident, SCB Medical College, Cuttack, Odisha.

Dr. Ranjita Ghadei Associate Professor, SCB Medical College, Cuttack, Odisha.

Dr. Swayamsiddha Mohanty* Senior Resident, SCB Medical College, Cuttack, Odisha. *Corresponding Author

Dr. Raman Shingade Consultant Radiologist, Nidan Diagnostic and Research Center, Bhubaneswar, Odisha.

ABSTRACT

INTRODUCTION: To study the complications and outcome with regard to maternal and perinatal morbidity and mortality in twin gestation.
MATERIALAND METHODS: A prospective observational study was carried out on 100 patients with twin gestation. Maternal data was collected about age, parity and history of twin pregnancy in the family, any previous history of twinning, history of ovulation inducing agents or assisted reproductive techniques, etc. Various associated maternal and perinatal complications were assessed and noted.
RESULTS: The leading maternal complications were anaemia, pregnancy induced hypertension, hyperemesis gravidarum, premature rupture of membrane, preterm labour, and postpartum haemorrhage, with preterm labour being most common maternal complication (65%). The association between- severe anaemia and post-partum haemorrhage was significant. The perinatal mortality rate was 10%. Most significant factor responsible was respiratory distress syndrome followed by intrauterine death, septicaemia and birth asphyxia. Major causes of perinatal morbidity were prematurity, low birth weight, jaundice, birth asphyxia, respiratory distress syndrome, intrauterine growth retardation and septicaemia.
CONCLUSION: Twin gestation is associated with increased maternal complications and perinatal morbidity and mortality. Early diagnosis of twin pregnancy is essential in preventing both maternal complications and fetal loss.

KEYWORDS

Twin Gestation, Obstetric Complications, Perinatal Complications

INTRODUCTION

Twin pregnancy is the simultaneous development of two embryos in uterus. A sharp rise in the incidence of twin and higher order gestation is seen now-a-days, because of easy availability and widespread use of ovulation inducing drugs, and the progress and development in assisted reproductive technology[1]. Currently multiple pregnancies account for 32/1000 (3.2%) of births globally, with 97% being twin pregnancies[2].

Even India is witnessing an unprecedented rise in number and rate of twin and higher order multiple births over the past two decades[3], posing greater challenges for obstetricians, due to an increased risk of obstetric complications. Some common obstetric complications include anemia, pre-eclampsia, antepartum hemorrhage, polyhydramnios and preterm labor, the incidence of which is significantly higher with multifetal pregnancies compared to singleton pregnancies[4].

Twin pregnancies are also associated with greater perinatal morbidity and mortality[5]. Its major causes include high incidence of low birth weight, malpresentations and congenital anomalies in twins.

Better understanding of twinning phenomenon and its complications is helpful to improve the outcome in twin gestation. The management of twin gestations needs to be focused on early and accurate prenatal diagnosis, detection and management of maternal complications and fetal growth restriction. Planning the time and mode of delivery in complicated twin pregnancies and early detection of monochorionic placentation and managing its consequences are crucial steps leading to a higher probability of successful outcome.

This study intends to assess the complications, management of labor and outcome with regard to maternal and perinatal morbidity and mortality in twin gestation.

MATERIALS AND METHODS

Approval was obtained from College Ethical Committee. All women with multiple pregnancies admitted to SCB Medical College & Hospital, Cuttack from January 2018 to Dec 2019 were studied prospectively after their written informed consent. A standard proforma was used to collect the data. The analysis was carried out based on etiological factors, maternal complications associated, presentations of babies, chorionicity, mode of delivery, period of gestation, birth weight and perinatal outcome.

The maternal age, parity and family history of twin pregnancy, any previous history of twinning, history of ovulation inducing agents or assisted reproductive techniques was specifically noted.

Detailed general, systemic and obstetric examination and routine blood and urine investigations for were done in all patients. Special investigations were done whenever indicated.

Complications during pregnancy such as anemia, pregnancy induced hypertension, preterm labour, hydramnios, antepartum hemorrhage, premature rupture of membranes were noted, investigated and managed accordingly.

When a patient went into labor, the duration of gestation was recorded. At the onset of labor, per vaginal examination was done to note cervical dilation, presentation, position, level of presenting part and type of pelvis. Labor was accelerated by oxytocin whenever indicated.

All vertex-vertex twin pairs without contraindication for vaginal delivery and when first twin was presenting by breech (uncomplicated), were left for vaginal delivery. In cases with contraindication for vaginal delivery, caesarean section was performed. Careful intrapartum monitoring was done.

After delivery of the first baby both abdominal and vaginal examination was done to identify the lie and presentation of the second fetus, if the second baby was presenting by vertex or breech, they were left for vaginal delivery.

Birth weight, sex, APGAR score at 5 mins, gestational age and congenital anomalies were assessed and recorded. Placentae were examined thoroughly, and chorionicity and amniocity was noted. Third stage of labor was managed carefully. Preterm babies were shifted to NICU. Mother and babies were followed till discharge and postnatal complications were noted. The cause of death as well as any associated factors were specifically noted in all cases of perinatal deaths.

Pearson's Chi-square test and t-test were used to test the significance of data at 95% confidence interval.

- **Inclusion Criteria:**

1. All patients who gave informed consent.

2. All twin pregnancies with gestational age ≥ 28 weeks were included in the study.

- **Exclusion Criteria:**

1. All patients who denied informed consent.
2. All patients with multifetal gestation more than two were excluded from the study.
3. All patients with chronic medical diseases.

OBSERVATIONS & RESULTS

Out of total 9497 deliveries during the year from January 2018 to December 2019 in our hospital, 100 patients presented with multiple pregnancy. The incidence of twin pregnancy in our study was 1: 92.4 deliveries. About 63% of cases were booked and remaining were referred from peripheral centers.

TABLE – 1 Demographic and Obstetrics profile of the patients

Demographic factors	Frequency	percentage
Age group (years)		
18 – 23	29	29%
24 – 29	49	49%
30 - 35	17	17%
36 - 41	5	5%
Gravida		
1	45	45%
2	35	35%
3	15	15%
4	5	5%
Gestational age (weeks)		
28 – 34 wks	22	22%
34 - 37wks	60	60%
37 – 42 wks	18	18%

Mean maternal age of the patients in present study was 25.8 yrs with majority cases between 24 to 29 years i.e. 49(49%). Analyzing the incidence from the above table, incidence of twin gestation was highest in primigravida (45%). There were 60 (60%) cases in Late Preterm (34 to <37 wks), 22(22%) cases in Early Preterm (28 to < 34wks), 18 (18%) cases in Term (37 to < 42wks) at the time of delivery.

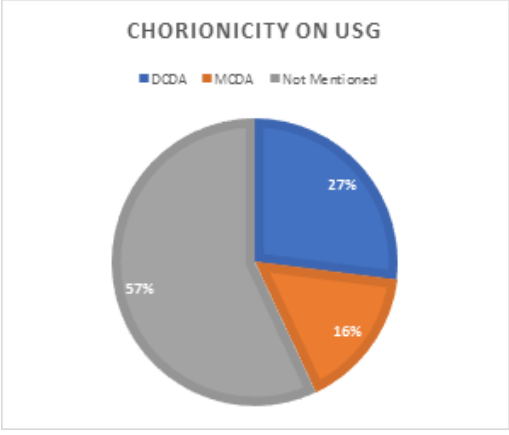

Figure 1: Graphical distribution of type of chorionicity on USG.

In 27 (27%) cases there was DCDA placenta, 16(16%) cases had MCDA placenta on USG while 57(57%) cases did not mention type of chorionicity on USG. Underlying probable causative factor for twining was revealed to be conception after intake of ovulation induction drugs in 8% women. Family history of twins was positive in 17% of cases.

TABLE – 2 Distribution of Twin Presentation

Twin Presentation	Frequency	Percentage
Vertex- Vertex	52	52%
Vertex-Breech	20	20%
Breech-Vertex	16	16%
Breech-Breech	9	9%
Vertex-Transverse	2	2%
Transverse- Transverse	1	1%
Total	100	100%

The vertex-vertex presentation in twins were maximum i.e. 52 cases (52%) followed by vertex-breech presentation i.e. 20 cases (20%). The most frequent mode of delivery was cesarean section(57%). Malpresentation and history of previous cesarean section were the main indications for cesarean delivery in our study.

TABLE – 3 Antenatal complications among patients

Complications	Frequency	percentage
Anaemia (moderate to severe)	13	13%
Hyperemesis gravidarum	47	47%
Hypertensive disorders (PIH, preeclampsia, eclampsia)	39	39%
PROM	31	31%
Polyhydraminos	7	7%
GDM	1	1%
Preterm labour	65	65%

Preterm labour (65%) was the most common antenatal complication encountered. Other maternal complications were hyperemesis gravidarum (47%), hypertensive disorders (39%) and PROM (31%). Only 1 case (1%) had GDM.

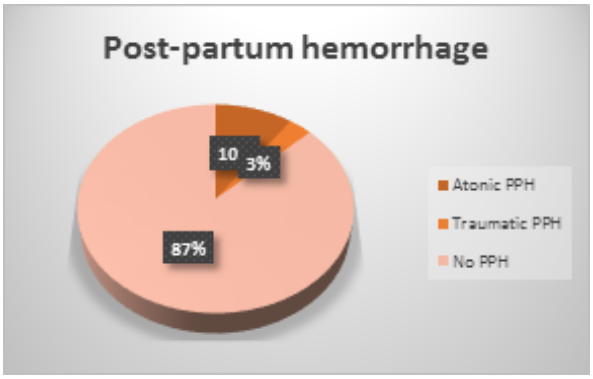

Figure 2: Graphical representation of Post-Partum Haemorrhage among the study participants(n=100)

There were 10 cases (10%) of atonic Post-Partum Hemorrhage and 3 cases (3%) cases had Traumatic Post-Partum hemorrhage. All cases were managed conservatively with uterotonic drugs and minor surgical procedures. Two(2%) cases required 2 units of blood transfusion and only 10 cases (10%) required 1 unit of Blood transfusion.

About 43% cases were delivered vaginally while 57% cases were delivered by cesarean section. 20% cases had Postnatal morbidity, 14 cases (14%) had failure of lactation and 6 cases (6%) had sub involution. Rest 80% did not have any postnatal morbidity.

TABLE – 4 Distribution of Birth weight among study participants (n=100)

Birth weight (kg)	Twin 1	Twin 2
<1 kg	3 (3%)	8 (8%)
1-<1.5 kg	17 (17%)	15 (15%)
1.5- <2.5 kg	65 (65%)	65 (65%)
>/= 2.5 kg	15 (15%)	12 (12%)

Maximum number of twins (65%) had birth weight between 1.5 to <2.5kg . 37% cases had birth weight discordancy >15%. Rest 63% had birth weight discordancy <15%.

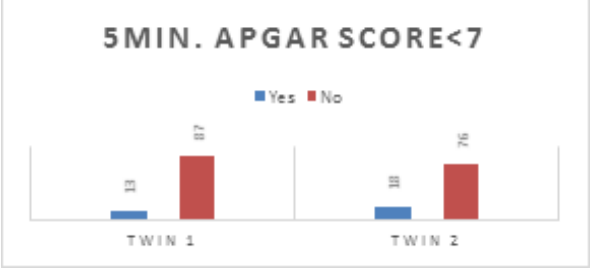

Figure 3: Graphical representation of 5-min. APGAR score<7 among Twin1 born to study participants

TABLE – 5 Perinatal Complications among the study patients(n=100)

Complications	Frequency	percentage
Prematurity	79	79%
Twin -1 IUGR	6	6%
Twin -2 IUGR	9	9%
Twin-1 NICU admission	46	46%
Twin-2 NICU admission	47	47%
RDS(twin-1)	3	3%
RDS(twin-2)	6	6%
Septicemia(twin-1)	2	2%
Septicemia(twin-2)	1	1%
Birth asphyxia	2	2%
IUD(twin-1)	0	0
IUD(twin-2)	6	6%
LBW(twin-1)	19	19%
LBW(twin-2)	26	26%

There were 13 cases (13%) of twin 1 and 18 cases (18%) of twin 2 with APGAR score <7 at 5 min. The percentage of low birth weight, very low birth weight, extreme low birth weight in twin 1 was 11%, 7%, 1% and in twin 2 was 14%, 8%, 4% respectively. Perinatal deaths were highest when birth weight was < 1.5kg. The perinatal mortality of second twin was more than the first i.e. 13% in twin2 and 7% in twin1. Also the incidence of IUGR(9%), birth hypoxia(2%), RDS(6%) and IUD(6%) was found to be significantly higher among second twins than first twins.

TABLE – 6 The association between- Gestational age, hypertensive disorders, preterm labour and Perinatal mortality.

	Perinatal death (n=16)	Alive newborn (n=84)	Total	P-value
Gestational age28- <34 wks	7 (31.8%)	15 (68.2%)	22	0.023
Gestational age34- <37wks	9 (15%)	51 (81%)	60	
Gestational age>37 wks	0	18 (100%)	18	
GHTN	0	10(100%)	10	0.049
Mild preeclampsia	4(40%)	6(60%)	10	
Moderate preeclampsia	2(33.3%)	4(66.7%)	18	
None	10(13.5%)	64(86.5%)	74	
preterm labour	14(21.5%)	51(78.5%)	65	0.040

- The perinatal mortality rate (PNMR) is dependent on gestational age and decreases with increasing gestational age. The result is significant at $p < 0.05$.
- The association between- Gestational age and Perinatal mortality was significant (p-value = 0.023).
- The association between Hypertensive disorders and Perinatal mortality was significant (p-value = 0.049).
- The association between Pre-term labor and Perinatal mortality was significant (p-value = 0.040).
- The association between Prematurity and Perinatal mortality was significant (p-value = 0.024).
- The association between NICU admission and Perinatal mortality was significant (p-value = 0.026).

DISCUSSION

In our study, the incidence of multiple pregnancy was 1:92.4 deliveries which is quite high in contrast to incidence of previous studies like Santana D.S.[8], Monden C.[7], and Upreti P et al[6]. This higher incidence in our study can be attributed to growing trend towards childbearing at advanced maternal age and disseminated use of Assisted Reproductive Techniques (ART), as 8% patients in present study had conceived after treatment for infertility with clomiphene citrate.

Majority of the women in our study (49%) were aged between 24 -29 years. This is consistent to a study by Farhat P[9] & Upreti P et al, where 56% were between 20-25yrs. Parity distribution of our study showed 45% were primigravida and 35% were second gravida, consistent to report by Upreti P et al with 47.2% and 33.6% respectively. Mean gestational age of women at delivery in our study was 34.87 wks i.e. 82% cases delivered before reaching term.

Dichorionic placentation was seen in majority (27%) in our study, as determined by USG and 72% revealed dichorinicity of placenta after birth which was comparable with C Manju Yadav et al [10] (65%) and Singh L[11] et al (66%).Vertex –vertex (vx-vx) presentation at delivery was most common fetal presentation in present study (52%) and was to be consistent with another study by Upreti P et al (43.%8) and C. Manju Yadav et al (63.6%).

Most frequent mode of delivery in our study was by lower segment cesarean section (57%), consistent to studies by Upreti P (49.5%). Malpresentation and history of previous cesarean section were the main indications for cesarean delivery in our study.

Preterm labour is common in multiple gestation and it was found to be the most common maternal complication in our study seen in 65% cases.

It was observed that perinatal mortality was largely dependant on gestational age, with perinatal mortality rate (PNMR) being greater at gestational age < 36 weeks. When perinatal mortality of both twins combined and compared with gestational age (p value <0.023).

When perinatal deaths of both twins were combined and analysed according to mode of delivery, higher perinatal deaths were associated with vaginal delivery (p =0.086). When compared individually, the association was not significant.

In our study, the percentage of low birth weight, very low birth weight, extreme low birth weight in twin 1 cases was 11%, 7%,1% and in twin 2 was 14%, 8%, 4% respectively. Perinatal deaths were highest with birth weight < 1 .5kg . The perinatal mortality of second twin was more than the first i.e. 13% in twin2 and 7% in twin1. In Chaudari study12, the perinatal mortality in twin 1 was 15% and in Twin 2 was 21%, which is similar to our study. Also the incidence of IUGR (9%), birth hypoxia(2%), RDS(6%) and IUD(6%) was found to be significantly higher among second twins than first.

Our study shows more deaths in cephalic presentation allowed vaginally whereas in Chaudari[12] study, more deaths were found in assisted breech delivery. The reason for more deaths were due to liberalisation of caesarean section for non-vertex presentation and deaths due to prematurity.

CONCLUSION

In our study leading maternal complications were anaemia, pregnancy induced hypertension, hyperemesis gravidarum, premature rupture of membrane, preterm labour, and postpartum haemorrhage. The association among the cases between- Severe Anaemia and Post-Partum Haemorrhage is significant.

The perinatal mortality rate was 10%. Most significant factor responsible was respiratory distress syndrome followed by intrauterine death, septicaemia and birth asphyxia. Major causes of perinatal morbidity were prematurity, low birth weight, jaundice, birth asphyxia, respiratory distress syndrome, intrauterine growth retardation and septicaemia.

Early diagnosis of twin pregnancy is essential in preventing both maternal complications and fetal loss. Routine prenatal determination of Chorionicity is beneficial in assessing obstetrical risks.

Regular and more frequent antenatal visits with surveillance for maternal and fetal complications, planned delivery at a tertiary centre, good neonatal care will help to decrease the maternal and fetal morbidity and mortality.

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