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MATERNAL AND PERINATAL OUTCOME OF MULTIPLE PREGNANCY: A PROSPECTIVE OBSERVATIONAL STUDY AT A TERTIARY CARE HOSPITAL

Obstetrics & Gynaecology

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ABSTRACT

Background: Multiple pregnancies constitute a significant portion of high-risk pregnancies and remain a major concern for both obstetricians and pediatricians due to the increased maternal and perinatal morbidity and mortality associated with them. The rise in multiple pregnancies is not without consequence. It is well established that multifetal gestations are associated with significantly higher risks of adverse maternal and fetal outcomes compared to singleton pregnancies. Maternal complications include a greater incidence of anemia, gestational hypertension, operative deliveries such as cesarean sections, preterm deliveries and postpartum hemorrhage. Additionally, there is a higher likelihood of miscarriage and intrauterine fetal deaths. **Materials & Methods:** A prospective observational study of Maternal and perinatal outcome of multiple pregnancy. A minimum of 40 women with multiple pregnancy were taken into this study. All the women admitted under Department of OBG, BMC & RC, Ballari after application of inclusion and exclusion criteria were taken up for the study. The patient's history was including previous multiple pregnancies, medical history, and any history of infertility treatment. Clinical examination was including physical examinations, vitals, cardiovascular and respiratory systems, uterine height, fetal lie, presentation, and heart sound. Uterine contractions, scar tenderness, and abdominal wall edema were noted. Per-speculum examinations include local pathology, leaks, and bleeding. **Results:** Our study found that 55% of multiple pregnancies were delivered via LSCS, primarily due to non-cephalic presentation, fetal distress, and maternal conditions like preeclampsia (PE) or previous cesarean sections. MCDA twins (30% of cases) had significantly higher complications such as TTTS (Twin-Twin Transfusion Syndrome), IUFD, and neonatal mortality (ENND) compared to DCDA twins. The mean gestational age at delivery was 34.2 weeks, with 52.5% of neonates requiring NICU care, predominantly in preterm births (<37 weeks). ENND (27.5%) and IUD (12.5%) were significantly associated with MCDA pregnancies and preterm birth. **Conclusion:** This study corroborates global data on the risks of multiple pregnancies, particularly MCDA twins and preterm births. The high rates of LSCS, NICU admissions, and mortality underscore the need for specialized antenatal care. Future research with larger cohorts could further refine risk stratification protocols.

KEYWORDS

Multiple pregnancies, Maternal outcome, Perinatal outcome.

INTRODUCTION:

Multiple pregnancies constitute a significant portion of high-risk pregnancies and remain a major concern for both obstetricians and pediatricians due to the increased maternal and perinatal morbidity and mortality associated with them[1]. The complexities inherent to multifetal gestations demand enhanced vigilance and care, considering the higher risks involved for both mother and babies[2].

Today, multifetal pregnancies are more common than in the past, largely owing to the wider application of artificial reproductive techniques[3]. Advances in infertility treatments, including ovulation induction and assisted reproductive technologies such as in vitro fertilization (IVF), have significantly contributed to the rise in the incidence of multiple gestations[4]. Moreover, a natural predisposition towards multiple births is observed among certain populations and ethnic groups[5]. The increased maternal age at conception - a trend seen globally - has also been recognized as a contributing factor, as older women are more likely to conceive twins or higher-order multiples spontaneously[6].

Globally, the prevalence of twin pregnancies varies widely, ranging from approximately 2 to 20 per 1000 live births. In Asia, the prevalence is reported to be around 5 to 6 per 1000 deliveries[7]. India, too, has witnessed a noticeable increase in multiple pregnancies over the past two decades. This trend mirrors global patterns, largely fueled by the greater availability and utilization of fertility treatments and shifting demographic patterns related to maternal age[8].

The rise in multiple pregnancies is not without consequence. It is well established that multifetal gestations are associated with significantly higher risks of adverse maternal and fetal outcomes compared to singleton pregnancies[9]. Maternal complications include a greater incidence of anemia, gestational hypertension, operative deliveries such as cesarean sections, and postpartum hemorrhage[10]. Additionally, there is a higher likelihood of miscarriage and intrauterine fetal deaths. Alarmingly, maternal mortality in cases of multiple pregnancies is estimated to be approximately 2.5 times higher than that associated with singleton pregnancies[11].

From the fetal perspective, complications such as preterm birth, low birth weight, and increased perinatal mortality are more prevalent[12]. Twins and higher-order multiples are at an inherently greater risk of requiring neonatal intensive care unit (NICU) admission, facing challenges like respiratory distress, infections, and developmental delays[13].

Given these facts, multiple pregnancies demand comprehensive prenatal care and closer monitoring throughout gestation. Early diagnosis, meticulous antenatal surveillance, appropriate management of complications, and timely delivery planning are critical components in improving maternal and neonatal outcomes[14].

Despite the growing incidence of multiple pregnancies in India, there remains a notable scarcity of focused research in this area, particularly regarding the maternal and neonatal outcomes specific to the Indian healthcare context. Recognizing this gap, the present study is being undertaken to evaluate the clinical profile, outcomes, and complications associated with multiple pregnancies at a tertiary care facility in Ballari, Karnataka. By analyzing the prevalence of maternal and fetal complications among women carrying multifetal gestations, this research seeks to provide valuable insights that may aid obstetricians and healthcare providers in delivering better care. Ultimately, understanding these patterns will contribute to developing strategies that enhance the management and prognosis of multiple pregnancies in similar settings.

The objective is to study the Maternal and perinatal outcome of multiple pregnancy.

MATERIALS & METHODS

A prospective study of Maternal and perinatal outcome of multiple pregnancy. A minimum of 40 women with multiple pregnancy were taken into this study. All the women admitted under Department of OBG, BMC & RC, Ballari after application of inclusion and exclusion criteria were taken up for the study.

Inclusion Criteria

- Multiple pregnancy confirmed by clinical or ultrasound

examination.
- Gestational age above 28 weeks

Exclusion Criteria
- One or more twin delivered outside our hospital in this pregnancy.

Method Of Collection Of Data
- Study participants were recruited during labour.
- The woman were followed up during intrapartum and post partum period until discharge.
- The patient's history were include previous multiple pregnancies, medical history, and any history of infertility treatment. Clinical examination were include physical examinations, vitals, cardiovascular and respiratory systems, uterine height, fetal lie, presentation, and heart sounds. Uterine contractions, scar tenderness, and abdominal wall edema were noted. Per-speculum examinations include local pathology, leaks, and bleeding. During labor, per-vaginal examination including cervical dilatation, effacement, membranes, liquor, presenting part of the fetus, position, and pelvis. Complications during the antenatal period was noted.
- Maternal condition during antenatal period that affects perinatal outcome like pregnancy induced hypertension, gestational diabetes mellitus, antepartum hemorrhage and preterm delivery shall also be studied.
- Routine investigations including complete blood count, urine for sugar, albumin, microscopy, blood group and Rh, blood sugar, HIV and HBSAG along with USG for chorionicity (classified as dichorionic, monochorionic diamniotic, monochorioic monoamniotic), placental site, weight of babies, presentation, amniotic fluid index.
- Other investigations include blood urea, serum creatinine, serum uric acid, liver function tests, bleeding time, clotting time, prothrombin time, international normalized ratio (INR) and urine culture, wherever available.
- Intrapartum fetal monitoring was done by intermittent auscultation of the fetal heart sounds and cardiotocography
- The perinatal outcome was recorded in terms of gestational age at delivery, mode of delivery (caesarian section/ vaginal delivery / combined), interval between delivery of first and second twin, Apgar scores at 0 and 5 minutes, birth weight, gender, dead/still/live, and admission to neonatal intensive care unit.
- Congenital malformations were diagnosed by ultrasound examination during the antenatal period or by clinical examination of the neonate.

Statistical Methods:
Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software. Categorical data was represented in the form of Frequencies and proportions. Chi-square was used as test of significance. Continuous data was represented as mean and standard deviation. Independent t test was used as test of significance to identify the mean difference. P value <0.05 were considered as statistically significant.

RESULTS

Table 1: Distribution of Maternal Age (years)

Variable	Mean ± SD	t-test (p-value)	Significance
Maternal Age (years)	23.4 ± 3.1	p = 0.45 (NS)	No significant impact on outcomes

Table 2: Distribution of Gestational Age (weeks)

Variable	Group	Mean ± SD	t-test (p-value)	Significance
Gestational Age (weeks)	All cases	34.2 ± 3.5	-	-
	With NICU admission	32.1 ± 3.2	p < 0.001	Lower GA linked to NICU
	Without NICU admission	36.4 ± 2.8		

Table 3: Distribution of Chorionicity

Variable	Categories	Frequency (n=40)	Proportion (%)	Chi-square (p-value)	Significant Associations
Chorionicity	DCDA	27	67.5%	p = 0.04 (MCDA vs. DCDA)	MCDA: Higher TTTS, IUD, ENND
	MCDA	12	30%		
	TCTA	1	2.5%		

DCDA/MCDA/TCTA: Dichorionic/Monochorionic/Triplet Chorionicity

Table 4: Distribution of Antepartum Complications

Variable	Categories	Frequency (n=40)	Proportion (%)	Chi-square (p-value)	Significant Associations
Antepartum Complications	Preeclampsia/Eclampsia	12	30%	p = 0.01 (with LSCS)	Strongly linked to LSCS
	Preterm Labor	6	15%	p < 0.001 (with NICU)	Higher NICU admissions
	IUFD/Anomalies	4	10%	p = 0.03 (with MCDA)	Associated with MCDA

PE: Preeclampsia and **IUFD**: Intrauterine Fetal Death

Table 5: Distribution of Mode of Delivery

Variable	Categories	Frequency (n=40)	Proportion (%)	Chi-square (p-value)	Significant Associations
Mode of Delivery	LSCS	22	55%	p < 0.05	Non-cephalic twin, PE, Scar tenderness
	PTVD/FTVD	18	45%		

LSCS: Lower Segment Cesarean Section and **PTVD/FTVD**: Preterm/Full-Term Vaginal Delivery

Table 6: Incidence Of Post Partum Complications

Category	Frequency (n=40)	Proportion (%)	z-test (p-value)	Significant associations
Post partum hemorrhage	05	12.5%	0.03	Multipara

Table 7: Distribution of Birth Weight (kg)

Variable	Group	Mean ± SD	t-test (p-value)	Significance
Birth Weight (kg)	Twin 1	2.0 ± 0.5	p = 0.003	Lower BW with complications
	Twin 2	1.9 ± 0.6		

Table 8: Distribution of NICU Admission

Variable	Categories	Frequency (n=40)	Proportion (%)	Chi-square (p-value)	Significant Associations
NICU Admission	Yes	21	52.5%	p < 0.001	Preterm (<37 weeks), BW <2 kg
	No	19	47.5%		

Table 9: Distribution of Neonatal outcome

Variable	Categories	Frequency (n=40)	Proportion (%)	Chi-square (p-value)	Significant Associations
Cause of Death	ENND	11	27.5%	p = 0.03 (MCDA, preterm)	MCDA, gestational age <34 weeks
	IUD	5	12.5%		

ENND: Early Neonatal Death and **IUD**: Intrauterine Death

DISCUSSION

The findings of this study on multiple pregnancies align with and expand upon existing literature, highlighting critical associations between chorionicity, maternal complications, and neonatal outcomes. Below, we discuss these correlations in the context of previous research.

Our study found that **55% of multiple pregnancies were delivered via LSCS**, primarily due to non-cephalic presentation, fetal distress, and maternal conditions like preeclampsia (PE) or previous cesarean sections. This is consistent with studies by **Schmitz et al. (2018)** [16], which reported higher cesarean rates (50-70%) in twins, especially in monochorionic (MCDA) pregnancies due to increased fetal risks. The strong association ($p < 0.05$) between **PE/eclampsia and LSCS** corroborates findings from **Sibai et al. (2000)** [17], who noted that hypertensive disorders in twins often necessitate early intervention to prevent adverse outcomes. Post partum compliations included post partum hemorrhage in 5 cases (12.5%).

MCDA twins (30% of cases) had significantly higher complications such as TTTS (Twin-Twin Transfusion Syndrome), IUFD, and neonatal mortality (ENND) compared to DCDA twins (p =

0.04). This mirrors research by **Lewi et al. (2013)** [18], which identified MCDA pregnancies as high-risk due to shared placental vasculature, leading to a **3-fold increase in perinatal mortality**. Our data also supports **Rao et al. (2019)** [19], who found that MCDA twins had higher rates of preterm birth (<34 weeks) and low birth weight (<2 kg), both linked to NICU admissions ($p < 0.001$).

The mean **gestational age at delivery was 34.2 weeks**, with **52.5% of neonates requiring NICU care**, predominantly in preterm births (<37 weeks). This aligns with **Martin et al. (2012)** [20], who reported that nearly **60% of twins are born preterm**, with a direct correlation between early delivery and respiratory distress syndrome (RDS). Our study further reinforces **Blondel et al. (2002)** [21], which highlighted that twins are **5 times more likely to be admitted to NICUs** than singletons, primarily due to low birth weight (mean Twin 1: 2.0 kg; Twin 2: 1.9 kg).

ENND (27.5%) and IUD (12.5%) were significantly associated with **MCDA pregnancies and preterm birth**, consistent with **Sherer et al. (2018)** [22], who noted that monochorionicity increases the risk of stillbirth by 15-20%. Additionally, **PE (30% of cases) and IUFD (10%)** were key contributors, echoing **Hall et al. (2015)** [23], which identified hypertensive disorders as leading causes of iatrogenic preterm delivery in twins.

Strengths And Limitations

Strengths: The study provides granular data on chorionicity-specific outcomes, reinforcing evidence-based management guidelines.

Limitations: Small sample size (n=40) and retrospective design may limit generalizability. Missing data (e.g., incomplete cause of death entries) could affect mortality analysis.

Clinical Implications

Enhanced Monitoring for MCDA Pregnancies: Given their higher complication rates, early ultrasound surveillance for TTTS is critical.

Timely Intervention for PE/Preterm Labor: Proactive management may reduce NICU admissions and mortality.

Counseling On Delivery Routes: Patients with non-cephalic twins or prior LSCS should be counseled on likely cesarean delivery.

CONCLUSION

This study corroborates global data on the risks of multiple pregnancies, particularly MCDA twins and preterm births. The high rates of LSCS, NICU admissions, and mortality underscore the need for specialized antenatal care. Future research with larger cohorts could further refine risk stratification protocols.

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