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Original Research Article

Fetomaternal outcome in multiple pregnancy

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ABSTRACT

Background: Multiple pregnancies are more common in recent days than in the past. Increased maternal age at conception due to delayed childbearing trend has resulted in multifetal gestations. Twin gestation imposes greater demand on the maternal physiological system than does singleton pregnancy. The incidence of multifetal gestation has increased mainly because of advanced maternal age and assisted reproductive technology. Multiple pregnancy is considered as high-risk pregnancy as it contributes significantly to adverse maternal and perinatal outcomes.

Methods: In this prospective observational study conducted in obstetrics and gynaecology department VMKVMCH, Salem for 6 months period, around 50 cases of multiple pregnancy were taken into consideration and patients were followed up from admission till delivery and neonatal outcome analysed. Main outcome measures were maternal complications (anaemia, pre-eclampsia, post-partum hemorrhage, gestational diabetes mellitus (GDM), perinatal mortality and morbidity).

Results: Higher incidence of twin gestation was noted between the age group of 20-25 years and maximum were of spontaneous conception. None of them had family history of twins or past history of the same. We noted that maximum were preterm deliveries and majority of the patients underwent lower segment caesarean section (LSCS). Twin specific complications were noted according to their chorionicity. Most of the babies weighed between 1.5-2.5 kg. Perinatal mortality was 7.5% and no maternal mortality noted.

Conclusions: The knowledge of maternal and fetal risks associated with multiple gestation helps in prevention of adverse outcome and better surveillance.

Keywords: Twin gestation, Maternal, Perinatal, Chorionicity

INTRODUCTION

Multiple pregnancy refers to a development of 2 or more fetuses simultaneously in a pregnant uterus. The naturally occurring twin pregnancy is approximately 1 in 80 births and natural higher order multifetal gestations are uncommon. The evolving infertility treatment has lowered the rate of higher order multifetal births. The incidence was 1% of all pregnancies but the incidence rate appears to be variable in different parts of the world.¹⁻³ Multifetal gestations are more common in recent days than in the past and the incidence is largely fueled by the infertility therapy. The rates, number of twins and higher order multifetal gestation increased between 1980 and 2001.⁴

Prevalence of twin births varies between 2-20 per 1000 births throughout the world. The increase in multiple gestation can be due to women's attitude towards childbearing and postponing pregnancy in favour of career, work and also because of increased trend in seeking infertility treatment like assisted reproductive techniques (ART) and conception at advanced maternal age.⁵ One of the predisposing factor of twin gestation is increase in maternal age which leads to decrease in fertility and this may lead to increased use of ART like ovulation induction, in vitro fertilization and intracytoplasmic sperm injection.^{6,7} Multiple pregnancy imposes greater demand on the maternal physiological system than do singleton pregnancies. With increase in the incidence of twin

pregnancies increase in the rate of maternal mortality were noted, thus it is a very challenging task for obstetrician. It is also associated with poor perinatal outcome. Complications occur in 25% of singleton pregnancies whereas 83% of twin pregnancies have complications leading to 10% perinatal mortality.^{8,9} Increased maternal complications are due to burden on the adaptive capacity, hence twin pregnancy is considered as high-risk pregnancy and needs vigilant obstetric care.¹⁰ There are 2 types of twin pregnancy: fraternal and identical. The cause for twinning is not known, multiple pregnancies occur more frequently from fertilization of 2 separate oocytes (dizygotic) than from single fertilized oocyte which subsequently divides into two identical twins (monozygotic). Approximately 30% are monozygotic and 70% are dizygotic. Monozygotic twins occur at a rate of 1 in 250 births and is constant throughout the world. Two-to-five-fold increased incidence of monozygotic twins are due to conception by ART. Maternal factors like high parity, rising maternal age, races, hereditary factors (especially maternal side) lead to increased frequency of dizygotic twins. Chorionicity rather than zygosity is the main factor to determine the pregnancy outcome.³ Chorionicity is detected by ultrasonography in antenatal period and by placental examination following delivery. It is classified as monochorionic monoamniotic (MCMA), monochorionic diamniotic (MCDA) and dichorionic diamniotic (DCDA). The incidence of intrauterine death (IUD), fetal abnormalities, twin-twin transfusion syndrome (TTTS) is common in monochorionic twins and increasing development of discordant growth is seen in monochorionic twins, hence Monozygotic twins are at greater risk.³ Increased rate of maternal risks like antepartum haemorrhage, pre-eclampsia, anaemia, polyhydramnios, premature rupture of membranes (PROM), preterm labour and postpartum haemorrhage are noted in multifetal gestation. Because of the higher rate of complications, caesarean section rate also becomes higher in multiple pregnancy when compared with a singleton gestation.^{11,12} Fetal risks that are anticipated in multiple pregnancies are prematurity, fetal growth retardation, low birth weight, birth asphyxia, birth trauma, congenital anomalies and certain fetal complications peculiar to twin pregnancies. Twins have five-fold risk of dying before the age of one year when compared to singleton pregnancy. Failure rates are higher in normalising the complications in multiple pregnancy even with vast available and advanced knowledge. So, the idea of close observation helps in dealing with these situations. Thus, the aim and objective of our study was to study the maternal and fetal complications and to analyse perinatal mortality and morbidity associated with twin pregnancies in our institution.

METHODS

This study included prospective observational analysis of 50 women with twin pregnancies, over a period of 6 months from January 2021 to June 2021 in department of obstetrics and gynaecology, VMKVMCH, Salem.

Patients in this study were from different socio-economic status and had different educational status. Detailed history including family history, infertility treatment history was taken. All routine and specific investigations were done. They were hospitalized when required and complications were treated. Information pertaining to study like age, residence, parity, gravida, family history of twin pregnancy was obtained. Chorionicity was assessed using ultrasonogram antenatally and placental examination after delivery of the placenta. All the patients were delivered in our institution under close observation. Course of labour, mode of delivery and outcome of labour including fetal outcome were noted. Date, time of delivery, duration of labour and interval between the two babies were noted. All stages of labour were carefully managed with the presence of team of obstetricians. Antepartum, intra-partum and postpartum complications were also noted. All the babies were examined by neonatologist after birth and NICU care was given when required. Patients were followed-up till discharge.

Statistical analysis

Descriptive analysis of the baseline characteristics was analysed using mean, standard deviation (SD), percentages and proportions along with 95% confidence interval. Proportions were compared using Chi-square test of significance. $P < 0.05$ was accepted as indicating statistical significance. Data was analysed using Microsoft excel and SPSS V26.

Inclusion criteria

Women with twin pregnancy of more than 28 weeks of gestational age attending antenatal OP/ antenatal ward/ labour ward were included in the study.

Exclusion criteria

Patients with triplet pregnancy and higher order multifetal gestations, patients with gestational age less than 28 weeks, patients with known history of chronic hypertension/ diabetes mellitus/ chronic renal disease and other chronic medical disorders and one fetus delivered outside our hospital were excluded from the study.

RESULTS

It is a prospective observational study in which we observed over 50 twin gestations, all booked in our institution. By satisfying inclusion criteria the following results were observed. Higher incidences were noted between the age group of 20-25 years (76%), 18% noted between age group of 26-30 years and a lower incidence was noted in patients above 30 years (6%). In our study highest incidence of twin pregnancies with regards to parity were among primigravida (64%) and maximum were of spontaneous conception (80%), followed by conception from ovulation induction (20%). None of them had family history of twins or history of the same. In our

study 22 (44%) had preterm deliveries and 16 (32%) delivered after 36 weeks of gestation as shown in Table 1.

When coming to maternal complications we noted 18 women (36%) with anaemia, 13 (26%) with pre-eclampsia, however only 2 patients had eclampsia and 12% had preterm premature rupture of membrane (PPROM). Six patients had hypothyroidism, 4 patients had GDM and only 3 patients had Oligohydramnios. In our study 31 (62%) had DCDA, 16 (32%) had MCDA and 3 (6%) had MCMA. Majority of the patients underwent caesarean section (LSCS)-54% for indications like non vertex presentation in 17 patients (34%), previous LSCS in 3 cases (6%), fetal distress in 7 cases (14%) and 23 patients delivered vaginally (46%) as shown in Table 2.

Majority of the twin had caesarean section either elective or emergency. Mode of delivery according to chorionicity was also noted. 20 cases with DCDA (52.6%) and 7 cases with MCDA (58.3%) underwent caesarean section. 18 cases with DCDA (47.4%) and 5 cases with MCDA (41.6%) delivered vaginally as shown in Table 3.

Out of 50 cases, 20 patients had intrapartum complications like PPH, malpresentation, cord prolapse, low lying placenta, placental abruption. In this 14 had malpresentation and 5 had PPH. These intrapartum complications were also categorised according to their chorionicity. Malpresentations were seen in 26.3% of DCDA and 33.3% of MCDA with $p=0.47$. Both were not statistically significant as shown in Table 4.

Single fetal demise was seen in 3 cases (7.9%), TTTS in 1 case (8.3%), acardia twin in 1 case (8.3%) and 1 case had congenital anomalies (2.6%). These twin specific complications were noted according to their chorionicity. Discordant twin was seen in 7.9% of DCDA and 8.3% MCDA with $p=0.57$ (statistically insignificant). Single IUD in 7.9% of DCDA and none in MCDA with $p=0.57$ (statistically insignificant) as shown in Table 5.

Table 1: Demographic profile.

Characteristics	Number of patients	Percentage (%)
Maternal age (years)		
20-25	38	76
26-30	9	18
>30	3	6
Parity		
Primigravida	32	64
Multigravida	18	36
Mode of conception		
Spontaneous	40	80
Infertility treatment	10	20
Gestational age (weeks)		
28-32	22	44
>32-36	12	24
>36	16	32

Table 2: Antenatal maternal complications and mode of delivery.

Characteristics	Number	Percentage (%)	
Antenatal maternal complications			
Preeclampsia	13	26	
Eclampsia	2	4	
Anaemia	18	36	
Abruptio placenta	3	6	
Oligohydramnios	3	6	
GDM	4	8	
Hypothyroidism	6	12	
Premature rupture of membrane	4	8	
Preterm premature rupture of membrane	6	12	
Gestational thrombocytopenia	1	2	
Mode of delivery			
Normal vaginal delivery	23	46	
Caesarean section/ LSCS (54%)	Non-vertex	17	34
	Previous LSCS	3	6
	Fetal distress	7	14

Table 3: Mode of delivery depending on chorionicity.

Mode of delivery	Dichorionic diamniotic, (n=38)		Monochorionic diamniotic, (n=12)		P value
	N	%	N	%	
Normal vaginal delivery	18	47.4	5	41.6	0.98
Caesarean /LSCS	20	52.6	7	58.3	0.97
Total	38	100	12	100	

Table 4: Intrapartum complications according to the chorionicity.

Variables	Dichorionic diamniotic, (n=38)		Monochorionic diamniotic, (n=12)		P value
	N	%	N	%	
Post-partum hemorrhage	4	10.5	1	8.3	0.47
Malpresentation	10	26.3	4	33.3	0.72
Cord prolapses	2	5.3	0	0	0.97
Low lying placenta	1	2.6	0	0	0.54
Placental abruption	2	5.3	0	0	0.97
Total	19	50	5	41.6	

Table 5: Twin specific fetal complications according to the chorionicity.

Variables	Dichorionic diamniotic, (n=38)		Monochorionic diamniotic, (n=12)		P value
	N	%	N	%	
Twin to twin transfusion syndrome	0	0	1	8.3	0.24
Discordant twins	3	7.9	1	8.3	0.57
Acardiac twins	0	0	1	8.3	0.24
Single intrauterine fetal demise	3	7.9	0	0	0.57
Congenital anomalies	1	2.6	0	0	0.54
Total	7	18.4	3	25	

Table 6: Neonatal weight, complications and the outcome.

Variables	Twin 1	Twin 2
Birth weight (kg)		
<1	4	4
1-1.5	3	6
1.5-2	22	16
2-2.5	15	17
>2.5	6	7
NICU admission	Number	Percentage (%)
Needed	61	65.6
Not needed	32	34.4
Perinatal mortality (cause)		
Intrauterine death	1	1.1
Twin to twin transfusion syndrome	1	1.1
Birth asphyxia	3	3.2
Respiratory distress syndrome	2	2.2
Expired neonate and their chorionicity		
Dichorionic diamniotic, (n=38)	4	10.5
Monochorionic diamniotic, (n=12)	3	25

Out of 100 babies, 70 weighed between 1.5-2.5 kg (70%), 8 had extremely low birth weight and <20% had discordance in weight between twins. In our study prematurity was a major problem and incidence of perinatal mortality 7.5%. Out of 7 perinatal mortalities, one was IUD, 2 were due to respiratory distress syndrome and 3 were due to birth asphyxia. These neonatal deaths were also noted based on their chorionicity. Out of 7 neonatal deaths, 4 were from DCDA and the 3 from MCDA. P=0.34 (statistically insignificant) as shown in the Table 6.

DISCUSSION

Multifetal gestation is a high-risk pregnancy as it has antepartum, intrapartum as well as fetal complications, including long term developmental issues. In last 2 decades, assisted reproductive technologies have seen a greater number of multiple gestations. Studies conducted in India since 1970s showed maternal twinning rate at 9-16/1000 births.¹³

In our study 80% had spontaneous conception and 20% conceived from ovulation induction. Our findings shows that maternal and perinatal morbidity and mortality among twin births were in low resource setting and twin pregnancy poses an intrinsic risk to both mother and neonates.

We observed the highest incidence in the age group of 20-25 (76%) and least incidence was noted in women above 30 years (6%). Highest incidence was noted among primigravida.

All participants were registered, had regular antenatal check-up in our institution and underwent adequate ultrasounds. In spite of this good antenatal care 68% had preterm delivery in our study, whereas Chowdhury et al showed 44%, Hashimoto et al and other series showed 29-54%. Bangal et al showed 88% preterm delivery which was much higher than our study.^{14,15}

Our study showed that, common antepartum complications associated with twin pregnancy were anaemia (36%), pre-eclampsia (26%) and preterm deliveries (68%) but study conducted by Rizwan et al showed preterm labour (84%), anaemia (65.6%) and hypertension (31.2%) as common antepartum complications which is much higher than our study.¹⁶ Spellacy et al study showed 9.4% and Chowdhury et al showed 26% of anaemia in their study. Generally, incidence of pre-eclampsia is 2.6 times higher in twin gestation than in singleton pregnancy.¹⁷ Spellacy et al study showed 12% of pre-eclampsia whereas in this study we noted higher rate of 26%.

In our study 54% had caesarean section which was like Chittacharoen study.^{18,19} Average birth weight ranges between 1.5-2.5 kg in both the twins as supported by Chowdhury et al study and Bangal et al showed incidence of 1.5-2.5 kg birth weight in 82%. No maternal mortality was noted in our study. NICU admissions were required in 65.6% of cases. Our study showed 7 perinatal deaths (7.6%), which was like Adesina et al study and Sulthan et al reported 11% of perinatal mortality.

CONCLUSION

Twin pregnancy seems to be a significant risk factor for maternal and perinatal mortality and morbidity. Even though management of twin pregnancy is challenging, most of the complications are preventable. Proper

antenatal care with timely decisions can lead to better fetomaternal outcome and a better antenatal care proved to be an important factor in lowering the incidence of perinatal mortality.

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