

Comparative study of maternal complications & perinatal outcome in twin pregnancy and singleton pregnancy

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Abstract:

Background: Twin pregnancy is a high-risk pregnancy with increased incidence in the past few years. They are associated with much higher rates of maternal and perinatal morbidity and mortality as compared to singleton pregnancies.

Material and methods: This was a prospective case control study conducted at Department of Obstetrics and Gynaecology, BNMCC, Government Medical College, Amritsar from February 2019 to August 2020. 100 cases of twin pregnancies (cases) and 100 singleton pregnancies (controls) delivered at our hospital were recruited in the study. After history taking, patients were subjected to examination and relevant investigations as per the protocol. Various fetomaternal parameters were recorded and the data was analysed statistically.

Results: The incidence of twin pregnancies was 1.75% with majority patients belonging to 21-25 years age group. Most of the patients in our study were multigravida. Iatrogenic conception was seen in 8% of twin pregnancies. Mean gestational age of presentation was 33.3 weeks in twin pregnancies as compared to 36.4 weeks in singleton pregnancies. DCDA was the most common type of placentation seen in 64% of twin pregnancies. Preterm labour (62%), anaemia (59%) and malpresentation (35%) were the major complications in twin pregnancies which were significantly higher as compared to singletons. Other complications like PROM (23%), hypertensive disorders (17%), PPH (11%), hyperemesis (5%) were also more common in twin pregnancies. Significantly higher rates of LSCS (62%) were found in twin pregnancies as compared to 42% in singleton pregnancies. Low birth weight babies were seen in 89% of twin pregnancies as compared to 21% of singleton pregnancies. Complications associated with prematurity and low birth weight were the main causes of neonatal morbidities and mortality in cases of twin pregnancies. Perinatal mortality in our study was 19% in first twin and 26% in second twin which was significantly higher as compared to 12% in singletons.

Conclusion: Twin pregnancies are associated with significant fetomaternal morbidity and mortality. Frequent antenatal visits, early detection of high-risk cases, timely referral, and early hospitalization with good neonatal care set up are necessary to improve the maternal and neonatal outcomes associated with twin pregnancies.

Key Word: Twin, preterm, low birth weight, BNMCC (Bebe Nanki Mother and Childcare Center), DCDA (Dichorionic diamniotic), PROM (Premature rupture of membranes), PPH (Post-partum haemorrhage), LSCS (Lower segment caesarean section)

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I. Introduction

Multiple births are much more common today than they were in the past. Throughout the world, the prevalence of twin births varies considerably i.e. approximately 1.5-20 per 1000 birth. This dramatic rise in the incidence of twins has been attributed to the increase in the use of ovulation inducing agents, use of assisted reproductive technologies, and a shift toward bearing children at older maternal ages, when multiple gestation are more likely to occur naturally¹. Twins are inherently different from singletons by their very nature and are at higher risk of maternal and fetal complications². It is important to assess the maternal risk factors and complications in twin pregnancies so that the fetomaternal outcome can be improved.

II. Material And Methods

This prospective case control study was conducted in the Department of Obstetrics and Gynaecology, Bebe Nanki Mother and Child Care Hospital (BNMCC), Government Medical College, Amritsar. This was a comparative study of twin and singleton pregnancy over a period of 1½ years from Feb. 2019 to Aug. 2020. 100 patients with twin pregnancy and 100 patients of singleton pregnancy were included in the study.

Study Design: Prospective case control study

Study Location: This was a tertiary care teaching hospital based study done in Department of Obstetrics and Gynaecology at Bebe Nanki Mother and Child Care Hospital (BNMCC), Government Medical College, Amritsar.

Study Duration: February 2019 to August 2020.

Sample size: 200 patients.

Subjects & selection method: The study population was drawn from pregnant women admitted to the ward and labour room at Bebe Nanki Mother and Child Care Hospital, Amritsar. 100 patients with confirmed twin pregnancy and 100 patients with singleton pregnancy were included. Their fetomaternal outcome and associated complications were compared and analysed statistically.

Inclusion criteria:

Case Group:

Women admitted to the ward and labour room after clinical & ultrasound diagnosis of twin gestation.

Control Group:

Women admitted to the ward and labour room with singleton pregnancy.

Exclusion criteria:

Women with any pre-existing medical disorder

Procedure Methodology

A thorough history of patients with chief complaints were recorded. Maternal parameters that were noted: Age, parity, family history of multiple pregnancies, history of infertility treatment or ovulation induction, antenatal registration and referred cases, antenatal high risk factor.

Detailed menstrual history, obstetric histories were recorded. General and systemic examination was done. Obstetric complications like PIH, anaemia, preterm labour, IUGR, PROM were noted. Maternal complications in labour were noted.

Outcome was recorded as number of patients who delivered spontaneously vaginally or requiring instrumentation and also those who required caesarean section. Fetal outcome in view of gestational age at birth, weight at birth, APGAR score at 1 minute and 5 minutes, requirement for NICU admission were analysed. Among the twins, first coming fetus was labelled as twin A and the second coming fetus was labelled as twin B.

Data was collected on a predesigned semi structured proforma on which patient's demographics data, risk factor for twin pregnancy, gestation, haemoglobin, mode of delivery, antepartum, intrapartum and postpartum complications comprising severe anaemia, pregnancy hypertension, pre-eclampsia, eclampsia, antepartum haemorrhage, maternal death, birth weight, APGAR score, neonatal intensive care admission (NICU), and perinatal outcome were recorded.

Statistical analysis

Data was analyzed using SPSS version 20. Student's *t*-test was used to ascertain the significance of differences between mean values of two continuous variables. Chi-square and Fisher exact tests were performed to test for differences in proportions of categorical variables between two or more groups. The level $P < 0.05$ was considered as the cutoff value for significance.

III. Result

Out of total 8228 pregnant women delivered in BNMCC from February 2019 to August 2020, 144 women presented with twin pregnancy, giving an incidence of twin pregnancies as 1.75%.

Demographic profile: Mean age of patients with twin pregnancy was 25.7 years and that of singleton pregnancy was 25.3 years as seen in table 1.

Table no 1: Shows comparison between age of patients, gestational age at presentation and mean birth weight between twins and singletons

	Groups		
	Group A (Twins)	Group B (Singleton)	
Mean Age of patients ± S.D. (in years)	25.75±4.01	25.33±3.92	
Mean Gestational age (weeks)	33.4	36.7	
	First twin	Second twin	Singleton
Mean Birth weight ± S.D. (in kg)	1.84±0.56	1.78±0.53	2.67±0.58

Family history of twin pregnancy was noted in 10% of the cases. Mean period of gestation in twin pregnancies was 33.4 weeks and in singleton pregnancies was 36.7 weeks. Type of placentation is shown in graph 1. Different presentation of fetuses is shown in table 2.

Graph no 1: Shows most of the twin pregnancies had dichorionic-diamniotic type of placentation in 64 % cases. 26% cases had monochorionic diamniotic type of placenta and rest of the cases (9%) had monochorionic monoamniotic type of placentation.

Graph no 1: Shows type of placentation in twin pregnancies

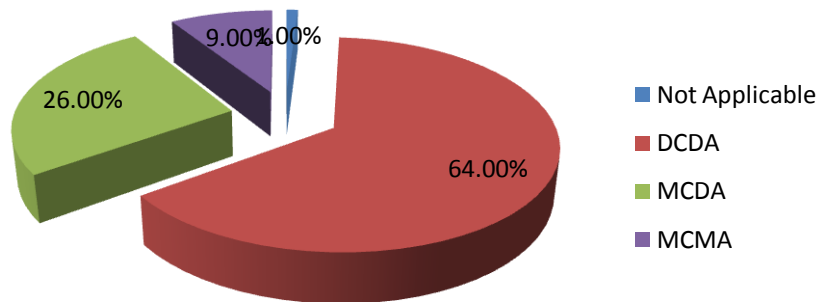


Table no 2: Shows majority of the cases of twin pregnancies (47%) had a vertex presentation of both the babies, followed by both breech presentation in 17% of cases. 50% cases had at least one baby in either breech or transverse presentation. 3 cases underwent abortion.

Table no 2: Shows mode of presentation in twins and singletons

Presentation	Number of cases
Twins	
Vertex – Vertex	47
Vertex – Breech	15
Vertex-Transverse	3
Breech-Vertex	12
Breech-Breech	17
Breech-Transverse	2
Transverse-Vertex	0
Transverse-Breech	1
Both Transverse	0
Not Applicable	3
Singletons	
Vertex	92
Breech	8
Transverse	0

Table no 3: Shows various obstetrical complications associated with twin pregnancies as compared to singletons. Preterm labour (62%), anaemia (59%) and malpresentation (35%) were the most commonly encountered obstetric complications in twin pregnancies. Other complications like PROM, hypertensive disorders and PPH were also more common in twin pregnancies.

Table no 3: Shows distribution of obstetric complications in twin and singleton pregnancies

Obstetric Complications	Groups		P-value
	Group A (Twin)	Group B (Singleton)	
Hypertensive Disorders	17 (17.0%)	24 (24.0%)	0.220
Antepartum Haemorrhage	7 (7.0%)	4 (4.0%)	0.352
Premature Rupture of Membranes	23 (23.0%)	11 (11.0%)	0.023
Preterm Labour	62 (62.0%)	26 (26.0%)	0.042
Gestational DM	2 (2.0%)	1 (1.0%)	0.561
Anaemia	59 (59.0%)	55 (55.0%)	0.668
Intra Uterine Growth Restriction	6 (6.0%)	9 (9.0%)	0.421
Polyhydramnios	5 (5.0%)	2 (2.0%)	0.445
Hyperemesis	5 (5.0%)	1 (1.0%)	0.097
Cord Prolapse	4 (4.0.0%)	1 (1.0%)	0.174
Malpresentation	35 (35.0%)	10 (10.0%)	0.001
Post-Partum Haemorrhage	11 (11.0%)	5 (5.0%)	0.118

LSCS was the most common mode of delivery in twin pregnancies, with 62% in 1st twin and 63% in 2nd twin with malpresentation (30.1%) as the most common indication followed by fetal distress (25.3%) (Table 4). Vaginal delivery was the most common mode of delivery in singleton cases accounting to 58%.

Table no 4 : Shows various neonatal complications seen in twins as compared to singletons. NICU admission was noted in 49% cases of twin pregnancies and 13% cases of singletons. It was found to be statistically significant with p-value 0.048. Prematurity was seen in 62% cases of twin pregnancies and 26% cases of singletons which was statistically significant with p-value 0.042. Birth asphyxia was seen in 15% cases of twin pregnancies compared to 2% cases of singletons with a statistically significant p-value of 0.01. Respiratory distress syndrome was noted in 27% cases of twin pregnancies and 2% cases of singletons, with a statistically significant p-value of 0.001. Low birth weight was noted in 89% cases of twin pregnancies and 21% cases of singletons with a highly statistical significant p-value of 0.002.

Congenital anomaly was seen in 5% cases of twin pregnancies and 7% cases of singletons, which was not found to be statistically significant with p-value more than 0.05. Discordancy between twins was seen in 7% of twin pregnancies. Hyperbilirubinemia was seen in 11% cases of twin pregnancies as compared to 2% cases of singleton pregnancies, not statistically significant with p-value more than 0.05. Sepsis was seen in 9% cases of twin pregnancies in comparison to 6% cases of singleton pregnancies which was statistically insignificant with p-value more than 0.05. 1 case of twin pregnancy was complicated by twin to twin transfusion syndrome.

Table no 4: Shows neonatal complications in twin pregnancies and singletons

Neonatal Complications	Groups		P value
	Group A (Twins)	Group B (Singleton)	
Any Associated Congenital Anomaly	05 (5.0%)	07 (7.0%)	0.120
NICU Admission	49 (49.0%)	13 (13.0%)	0.048
Preterm/Prematurity	62 (62.0%)	26 (26.0%)	0.042
Discordancy between twins	07 (7.0%)	Not Applicable	Not Applicable
Respiratory Distress Syndrome	27 (27.0%)	2 (2.0%)	0.001

Birth Asphyxia	15 (15.0%)	2 (2.0%)	0.01
Hyperbilirubinemia	11 (11.0%)	2 (2.0%)	0.07
Sepsis	9 (9.0%)	6 (6.0%)	0.150
Low Birth Weight	89 (89%)	21 (21%)	0.002
Twin to twin Transfusion Syndrome	1 (1.0%)	Not Applicable	Not Applicable

Perinatal complications: Most cases of twin pregnancies had birth interval of less than 5 minutes seen in 79% cases with mean birth interval of 4.09 minutes. Mean birth weight in singleton pregnancies was 2.67 ± 0.58 Kg. Mean birth weight of first baby and second baby in twin pregnancies was 1.84 ± 0.56 Kg and 1.78 ± 0.53 Kg respectively. (Table 1). Various neonatal complications associated with twins are shown in table 4. Perinatal mortality was seen in 19% cases of first twin and 26% cases of second twin. Perinatal mortality was seen in 12% cases of singleton pregnancies, statistically significant with p-value less than 0.05.

IV. Discussion

The incidence of twin pregnancies in our institute was 1.75% which is comparable to 1.81% and 1.49% by Singh L et al³ and Bangal et al⁴ respectively. In our study, the mean age of patients with twin pregnancy was 25.7 years and 25.3 years in singletons (Table 1). Similar findings were obtained by Bangal et al⁴ and Gajera AV et al⁵ in which majority of twin pregnancies were in age group 20-30 years. 62% of twins in our study were unbooked cases, indicating poor antenatal care even today. Family history of twin pregnancy was present in 10% cases of twin pregnancies which was comparable 8% by Bhalla S et al⁶.

In our study, mean period of gestation in twin pregnancies was 33.4 weeks as compared to 36.7 weeks in singletons, comparable to studies conducted by Erdemoglu et al⁷ (33 weeks), and Yuel et al⁸ (34 weeks). This could be attributed to the fact that twin pregnancies present to the hospital earlier due to more risk of preterm labour and other obstetrical complications. In our study, iatrogenic conception was noted in 8% of twins compared to 1% in singletons. DCDA type of placentation was seen in 64% cases, followed by MCDA type of placenta in 26% cases and rest of the cases had MCMA type of placentation (Graph 1). These findings were similar to the findings of study by Bhalla S et al⁶ in which DCDA type of placentation was seen in 60% cases, Panwala et al⁹ (63.8%) and by Singh L et al³ in which DCDA placenta was noted in 66% cases followed by MCDA in 32% cases.

In the present study, maximum of the cases of twin pregnancies (47%) had a vertex presentation of both the babies, followed by both breech in 17% of cases (Table II), similar to Singh L et al³ results in which 48% cases had vertex presentation in both twins and Chowdhury et al¹⁰ results in which 47.5% twins had vertex presentation in both twins, followed by breech-vertex and vertex-breech. In singleton cases, 92% cases had vertex presentation and only 8% cases had breech presentation. Significant difference was noted in terms of malpresentation which was seen in 35% cases of twins and in only 8% cases of singletons. In our study, preterm labour ($p=0.042$), followed by anaemia ($p=0.668$) and malpresentation ($p=0.001$) were the most commonly encountered obstetric complications in twin pregnancies. Preterm labour was seen in 62% twin pregnancies, which is comparable to 69% by Gajera AV et al⁵. Anaemia($p=0.668$) was seen in 59% of twin pregnancies, nearer to 62% by Bhalla S et al⁶, lower incidence by Chowdhury et al¹⁰ (26%) and Spellacy et al (9.4%)¹¹. The reason can be differing prevalence of anaemia in different regions of the country but in all the above-mentioned studies, incidence was more in twin gestations as compared to singleton gestations. The main reason is higher demand in twin gestations resulting in iron, Vitamin B12 and folic acid deficiency anaemia. Other obstetrical complications including preterm labour ($p=0.042$), PROM ($p=0.023$) and malpresentation ($p=0.001$) were significantly higher in twin pregnancies as compared to singletons (Table 3).

Rate of LSCS was 63% in twin cases as compared to 42% in singletons, nearer to 56% by Sultana et al¹². The high rate of LSCS can be due to increased incidence of preterm labour, malpresentation and other obstetrical complications in twins and our centre is a tertiary referral hospital.

Low birth weight was seen in 89% of twins vs 30% in singletons ($p=0.002$). Prematurity was seen in 62% of twins vs 26% cases of singletons ($p=0.042$). Our findings are similar to the study conducted by Gajera AV et al⁵ in which 86.9% cases of twin pregnancies had low birth weight and prematurity was seen in 69% of twin pregnancies. Mean birth weight in singleton pregnancies in our study was 2.67 Kg as compared to 1.84 Kg for first twin and 1.78 Kg for second twin (Table 1). Gandhi S et al gave mean birth weight for first twin as 1.9Kg and 1.7Kg for second twin.¹³ Other perinatal complications like respiratory distress (27%, $p=0.001$), birth asphyxia (15%, $p=0.010$), sepsis (9%, $p=0.150$) and hyperbilirubinemia (11%, $p=0.07$) were significantly higher in cases of twins as compared to singleton pregnancies (Table 4). Fetal discordancy was seen in 7% of twin

pregnancies, much less than 30% by Bhalla S et al⁶. In the present study, NICU admission was needed in 49% cases of twin pregnancies and 13% cases of singletons (p value 0.048) (Table 4) as compared to 66% and 34.67% by Bhalla S et al⁶ and Singh L et al³ respectively. In our study, mean birth interval was 4.09 minutes. 22.9% cases of twin pregnancies had APGAR score less than 7 after 5 minutes, close to 30% by Ranawat R et al¹⁴.

Maternal and fetal complications given by different authors is shown in table 5. Perinatal mortality was 19% of first twin baby, 26% of second twin baby as compared to 12% in singletons. Singh L et al³ reports it as 18% and 8% in twins and singletons respectively. Gajera AV⁵ and Bangal et al⁴ found 17% and 17.5% perinatal mortality in twins respectively. The higher perinatal mortality signified the overall hazard accompanying twin deliveries.

Table no 5: Shows comparison of parameters of twin pregnancies from various studies

	Present study	Singh L et al	Bangal et al	Bhalla S et al
Incidence of twins	1.75%	1.81%	1.49%	2.8%
Mean Age (Years)	25.7	25.2		
Multigravida	63%	70%		
Booked cases	62%		76%	48%
Family history of twins	10%			8%
Mean period of gestation(weeks)	33.4	33.4		34
Iatrogenic conception	8%			12%
DCDA placentation	64%	66%		60%
Vertex presentation	47%	48%		52%
Maternal complications				
Preterm labour	62%	74.7%	84%	74%
Anaemia	59%	44%	66%	62%
PPH	11%	13.3%		18%
LSCS	63%	32.6%	33%	54%
Neonatal complications				
Prematurity	62%	74.6%	37%	70%
LBW	89%	78.6%	82%	88%
NICU admissions	49%	34.6%		66%
Perinatal mortality	22.5%	18%	17.5%	17%

V. Conclusion

Twin pregnancies are associated with poor obstetric and neonatal outcome. Our study indicates that twin pregnancy is associated with increased risk of preterm delivery, PROM and caesarean section deliveries. As far as the neonatal outcome is concerned, prematurity and LBW are the commonly associated neonatal morbidities in twin pregnancies. It indicates that regular antenatal visits, early detection of high-risk cases, timely referral, and early hospitalization with good neonatal care set up are necessary to improve the maternal and neonatal outcomes associated with twin pregnancies.

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