

## Unraveling Multiple Gestation – Analysis of Risk Factors and Outcome at Tertiary Care Hospital

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### Abstract:

**Background:** A pregnancy with more than one fetus is called multiple pregnancy. Multiple pregnancies are prevailing due to a dramatic increase in use of ovulation-inducing agents, ART, and shift towards elderly primigravida and grand multiparity.

**Aims and Objectives:** To study maternal risk factors and fetal outcomes associated with multiple gestation.

**Materials and Methods:** This retrospective study was carried out at adichunchangiri institute of medical sciences, Mandya. A sample of 70 mothers with multiple gestation was collected from hospital records regarding maternal age, parity, risk factors, spontaneous or assisted conception, gestational age, pregestational BMI, and family history. Fetomaternal complications that occurred during the antenatal period, labor, and mode of delivery were collected and analyzed.

**Results:** Out of 8000 deliveries, there were 70 cases of multiple gestation over 5 years, with an incidence rate of 8.75 in 1000 deliveries. 8.5% are conceived by ovulation induction, 5.7% by IVF. 24% MCDA, 73.28% DCDA, and 2.8% are MCMA twins. Preterm labor (65.6%), anemia (46.8%), and hypertension (10.5%) were common problems. (61.4%) vaginal deliveries and (35.7%) LSCS were conducted. Fetal malpresentation leads to 32% of LSCS. Among fetal complications, FGR was seen in 11.4%. A low APGAR score was noted in 21.4% of preterm babies.

**Conclusion:** Maternal risk factors include multiparity, elderly pregnancy, use of ovulation induction, and ART. Maternal complications are preterm labor, PROM, PPROM, abruption, PPH, etc. Fetal complications noted are hypoglycemia, respiratory distress, intraventricular hemorrhage, necrotizing enterocolitis, stillbirth, low birth weight etc. Hence the restricted use of ovulation induction ART, promoting early conception. Vigilance during ANC and labor is needed in selecting the mode of delivery. Active fetal surveillance and intervention improve fetomaternal outcomes.

**Keywords:** Multiple Gestation, Risk Factors, Fetomaternal Outcome.

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### Introduction

A pregnancy with more than one fetus is called a multiple pregnancy. The global multiple pregnancy rates have increased due to the dramatic increase in use of ovulation-induction drugs, IVF, intracytoplasmic sperm injection, shift towards elderly primigravida, H/O multiple pregnancy in the family, especially on the maternal side, good nutrition status of the mother, certain races (Africans >Japanese), and multiparity. [1]. Multiple gestation is considered high-risk pregnancies commonest being twin pregnancy. It can lead to many maternal and perinatal complications; a greater number of caesarean sections are established in twin pregnancies compared with a singleton gestation. [2]. Maternal risk factors include ovulation induction, ART, hypertension

(PIH), gestational diabetes mellitus, obesity, and maternal complications include abortions, preterm labor, antepartum, postpartum hemorrhage, etc.

Perinatal complications like prematurity, fetal growth restriction (FGR), discordant twins, twin-to-twin transfusion syndrome, intrauterine fetal demise, and multiple gestation contribute to 10–12% of perinatal mortality.

The risks of congenital malformation and its consequences are greater with multi-fetal gestation. Infant mortality rose proportionally with the number of fetuses in the pregnancy. [3].

To minimize the risks, patients with multiple pregnancies require close monitoring, frequent follow-up, and timely management.

**Aims & Objectives:** To study the incidence, risk factors, fetomaternal outcomes associated with multiple gestation at our institute.

### Materials and Methods

This retrospective observational study was carried out at AIMS Bellur, Mandya. A total of 70 mothers during past 5 years who presented with multiple pregnancy were included in this study. Data were collected from hospital records regarding maternal age, parity, risk factors, whether spontaneous or assisted conception, gestational age, pregestational body mass index (BMI), and family history. Details of maternal and fetal complications that occurred during the antepartum, intrapartum, and postpartum period, as well as the mode of delivery, were collected and analyzed.

### Inclusion Criteria

- Multiple gestation with more than or equal to 24 completed weeks.
- All women booked or unbooked who delivered in our hospital.

### Exclusion Criteria

- All singleton pregnancy
- Women with gestational age less than 24 weeks
- Women who were delivered outside our hospital.

### Results

Out of the total 8000 deliveries studied retrospectively, there were 70 cases of multiple gestation over 5 years, with maternal ages ranging from 19 to 36 years, with an incidence rate of 8.75 in 1000 deliveries. All data was collected, tabulated, and analyzed.

The gestational age at the time of delivery ranged from 24-38 weeks of gestation, with a mean gestational age of  $34.6 \pm 2.2$  weeks. DCDA twins mean gestational age of delivery ranges from  $34.6 \pm 2.2$ . MCDA twins range from  $33.1 \pm 3$ . And MCMA twins mean gestational age of delivery ranges from  $32 \pm 2.2$  weeks. A total of 46 (65.7%) mothers had delivered before 36 weeks, and among those 17 (24.3%) patients who delivered before 32 weeks, delivery after 36 weeks was seen in 24 (34.6%) cases; all of them were DCDA twins, as shown in graph no. 1.

Among 70 mothers, 56% of cases had a normal pregestational BMI, 38% had a BMI ranging between 25 and 29.9 kg/m<sup>2</sup>, and 6% had a BMI ranging between 30 and 34.9 kg/m<sup>2</sup>. Graph No. 2.

Maternal risk factors include multiparity, elderly pregnancy, obesity, use of ovulation induction drugs and ART, and complications like preterm labor (65.6%) among DCDA twins (55%), MCDA

twins (62.5%), and MCMA twins (100%) who were preterm. PROM (18.3%), PPROM (10%), antepartum hemorrhage (1.4%), and PPH (9%) cases. Maternal medical conditions include anemia (46.8%), hypertension (10.5%), gestational diabetes mellitus (6%), hypothyroidism (22.8%), etc. (Table no 2,3).

There was no statistically significant association between the mode of delivery and other medical problems.

During the study period, there were no cases of maternal mortality among mothers with multiple pregnancy.

Vaginal delivery was the most common mode of delivery in 43 (61.4%) cases, and Caesarean delivery occurred in 25 (35.7%) cases. Combined vaginal-abdominal delivery occurred in 2 (2.9%) cases due to inability to deliver the second baby vaginally due to transverse lie with non-reactive fetal status and one more case due to transverse lie with failed internal podalic version. (Table No.4).

Ovulation induction was done in 8.5% of patients, and 5.7% of in-vitro fertilization pregnancies in the present study showed ovulation induction and multiparity as major risk factors for multi-order pregnancies.

Malpresentations in twins (32%) were the major indication for LSCS. The presence of a breech or transverse lie in any of the fetuses increased the chances of LSCS. Followed by non-reactive fetal status (16%) and failure to progress accounting for 20% of cases, patients with previous LSCS also accounted for 20% of cases. Other indications being APH and cord prolapse requiring LSCS in 8% and 4% cases, respectively. The P value is 0.862, not significant (chi square test). (Table no 5).

Neonatal outcomes were separately analyzed. There were 140 babies. When chorionicity was studied, dichorionic diamniotic twins (n = 108) were more common than monochorionic diamniotic twins (n = 28). About 2 twins, i.e., n = 4, were monochorionic and monoamniotic. A total of 66 (47.1%) twins were both males, 36 (25.7%) were both females, and the remaining 38 (47.1%) were one male and the other female child.

The mean weight of the first twin was  $2.12 \pm 0.35$  kg, while the mean weight of the second twin was  $1.97 \pm 0.30$  kg. Out of 140 babies under study, the majority (45.7%) had a low birth weight (LBW) (birth weight < 2.5 kg), and 28.6% had a normal weight (birth weight  $\geq 2.50$  kg). Very low birth weight (VLBW) (weights between <1.5 kg) children were 20%, and extremely low birth weight (ELBW) (birth weight  $\leq 1000$  grams) was 7.1%. p value of 0.377, not significant, fisher exact test, (table no 6).

Fetal Growth Restriction (FGR) was seen in 11.4%, and birth weight discordance was noted in 15.4% of children, in (26%) DCDA twins, (49%) MCDA

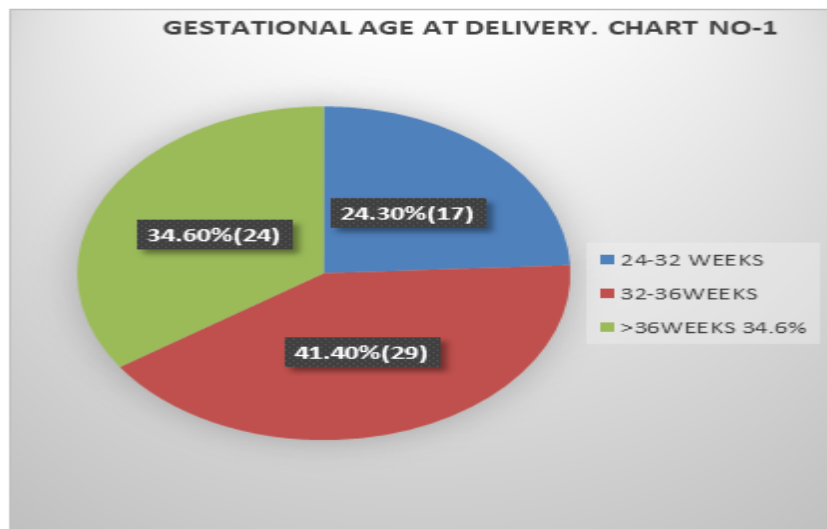
twins, and (50%) MCMA twins. A low APGAR score was noted in 21.4% of babies, while 1.42% of babies died in the early neonatal period.

**Table 1: Maternal demographic details**

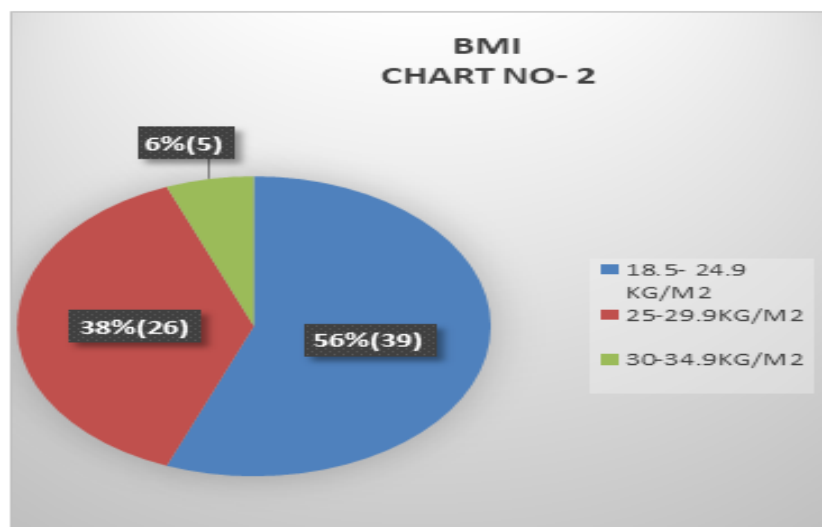
Maternal Age	Number	Percentage
19-25 Years	17	24.3
26-35 Years	29	41.4
36-40 Years	24	34.6
Parity	Number	Percentage
Primigravida	26	38
Multigravida	40	57
Grandmultipara	4	6

Out of 70 cases, 24.3% cases were between 19-25 years, 41.4 % were between 26-35 years, 34.6% between 36-40 year. Hence in our study majority of multiple gestation are between 26-35 years. (Table no 1). The value of R=0.4195, hence positive correlation is found with increasing maternal age and multiple gestation. P value is 0.0030, and is

significant. In current study, 38% were primigravida, 57% multigravida, and 6% were grand multipara, majority of higher order pregnancies are seen in multigravida. Hence multiparity is one of the major risk factors in multiple gestation. (Table no 1).



**Figure 1: Gestational age at delivery**



**Figure 2: BMI**

**Table 2: Maternal medical conditions**

Medical Conditions	Number	Percentage
Anaemia	32	46.8
Hypothyroidism	16	22.8
Hypertension	7	10.5
GDM	4	6

**Table 3: Maternal Complications**

Complications	Number	Percentage
PROM	13	18.3
PPROM	7	10
APH (Abruptio placenta)	1	1.4
PPH	6	9
Preterm	45	65.6

**Table 4: Mode of delivery**

Mode of Delivery	Twin I		Twin II	
	Number	Percentage	Number	Percentage
Vaginal	45	32.1	43	61.4
LSCS	25	35.7	27	19.2

**Table 5: Indication for LSCS**

Indication	Number	Percentage
Malpresentation	8	32
Non-reactive NST	4	16
Failure to progress	5	20
Previous LSCS	5	20
APH	2	8
Cord prolapse	1	4

P value is 0.862, not significant, chi square test

**Table 6: Distribution of weights of neonates**

	Twin I		Twin II	
	Number	Percentage	Number	Percentage
>2500g (NORMAL)	19	27.1	20	28.5
<2500g (LBW)	35	50	28	40
<1500g (VLBW)	12	17.14	16	22.8
<1000g (ELBW)	4	5.7	6	8.5

## Discussion

Analysis of multiple pregnancy over 5 years shows a multiple gestation rate of 8.75/1000 deliveries; the majority were between 26 - 35 years, with a mean age of 28.1±4.6 years admitted at AIMS, Mandya. Slightly increased rate of twins, with the increase in parity noted. An increased BMI increases the chance of multiple pregnancy. In this study, the mean pre-gestational BMI was 23.4 kg/m<sup>2</sup>.

The age distribution among multiple pregnancies in our study had the maximum number of patients in the age group of 20–35 years (70.76%), which is comparable with Yuel et al. (87.5%) [6]. The inadvertent use of ovulation induction drugs and artificial reproduction techniques (ART) has contributed to the rise in the higher order gestation. Ovulation induction was done in 8.5% of patients, and 5.7% of in-vitro fertilization pregnancies in the present study showed ovulation induction and multiparity as major risk factors for multi-order

pregnancy. In our study, the majority were dichorionic twins.

Most of the patients had conceived spontaneously in the maximum number, that is, 85.8 %, in our study, which is comparable with the Erdemoglu et al. study (94.62%). [8].

The type of placentation, which was correlated with antenatal USG and inspection of placenta and membranes after birth, was the majority (73.28%) in our study, which is comparable with Erdemoglu et al. (69.3%) [8] and Panwala et al. (63.8%). [7]. Multiple pregnancy are associated with greater complications than a singleton pregnancy. The present study included 65.6% preterm labor, among which DCDA twins (55%), MCDA twins (62.5%), and MCMA twins (100%) were preterm; the incidence of anemia was 26.8%; hypertension was 10.5%; GDM was 6%; postpartum hemorrhage occurred in 9% of cases; and other complications we came across were polyhydramnios (6%),

oligohydramnios (2%) and APH (ante partum hemorrhage) (8%).

In the present study, 35.7% of mothers had to undergo a caesarean section. Foetal malpresentation and fetal distress were the most common causes. The history of previous caesarean sections is also responsible. Improved and appropriate obstetrical and neonatal care over the years is primarily responsible for the improved fetal and perinatal outcomes in multiple gestation. [4]

This includes better use of steroids, tocolytics, and appropriate neonatal intensive care unit (ICU) care. [5] In the present study, 28.6% of babies had a normal birth weight, among 140 total babies. The mean weight of the first and second twins was  $2.12 \pm 0.35$  kg and  $1.97 \pm 0.30$  kg, respectively. About 21.4% of babies showed birth weight discrepancies. Other fetal complications that were seen include neonatal asphyxia (low APGAR score), FGR, birth weight discordance, respiratory distress, sepsis, hypoxic ischemic encephalopathy, intraventricular hemorrhage, necrotizing enterocolitis, cerebral palsy, etc. We have not observed any congenital anomalies in our study. In our study duration triplets, quadruplets and other higher order multiple gestation were not found. In our study, perinatal mortality and fewer complications were seen in dichorionic twins than in monochorionic twins. Good neonatal facilities probably helped us attain this good result.

### Conclusion

Maternal risk factors for multiple gestation in our study include elderly pregnancy, multiparity, use of ovulation induction drugs, and ART. Medical conditions mainly include anemia, diabetes, obesity, hypothyroidism, hypertension, and maternal complications such as preterm labor, PROM, PPROM, abruption, PPH, etc. Fetal complications, the majority related to FGR, like low birth weight, hypoglycemia, respiratory distress, intraventricular hemorrhage, necrotizing enterocolitis, stillbirth, etc., we conclude that there should be a minimum delay in the delivery of

second coming twins or triplets to prevent the long term effects of postnatal complications.

Restricted use of ovulation induction, ART, promoting early conception, and more vigilance during ANC and labor are needed in selecting modes of delivery. Active fetal surveillance and intervention improves fetomaternal outcomes.

### References

1. Gajera AV, Basavaanyya HP, Kavitha C, and Hiremath R. Fetomaternal outcome in twin pregnancy. *Int J Reprod Contracept Obstet Gynecol.* 2015 Dec; 4(6):1836–9.
2. Yadav MC, Mehta K, and Bhati I. Study of Fetomaternal Outcome in Twin Gestation at a Tertiary Care Centre in Western Rajasthan, *IOSR Journal of Dental and Medical Sciences.* 2020 Feb;19(2):25-29
3. Kumara K, Misra M, Jhanwar A, Kumari A. Fetomaternal outcome in twin pregnancies: a retrospective analysis from a tertiary care center, *Journal of Clinical and Diagnostic Research,* 2020 Jul;14(7): 01-05
4. Kundariya KR, Shah JM, Mewada BN, Shah MM, Patel AS Fetomaternal Outcome in Twin Pregnancy, *Journal of the South Asian Federation of Obstetrics and Gynecology,* 2023 Jan 31;14(6):663-666.
5. Bhakhar H, Dudharejia K, Goswami K, An observational study of 100 cases of fetomaternal outcomes of twins's gestation *MedPulse International Journal of Gynecology,* 2020; April, 14(1): 12–15.
6. Yuel VI., Kaur V. An analytical study of pregnancy outcome in multifetal gestation. *J Obstet Gynecol India.* 2007; 57(6): 509–512.
7. Panwala N., Mondkar A., and Ranade V. Purandare V. Multiple Pregnancy: A Review of 116 Cases *Journal of Postgraduate Medicine,* 1971; 18(3):108–114.
8. Erdemoglu M., Kale A., Akdeniz N., Yalinkaya A., Ozcan Y., et al. Retrospective Analysis of Multiple Pregnancies. *Perinatal Journal,* 2005;13(4).