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## Dr. Mamta Ramteke

Assistant Professor, Department of  
Obstetrics and Gynaecology, Rajiv  
Gandhi Medical College,  
Chhatrapati Shivaji Maharaj  
Hospital, Thane Belapur road,  
Kalwa, Thane, Maharashtra, India

## Dr. Sunita Gaikwad

Associate Professor, Department of  
Obstetrics and Gynaecology, Rajiv  
Gandhi Medical College,  
Chhatrapati Shivaji Maharaj  
Hospital, Thane Belapur Road,  
Kalwa, Thane, Maharashtra, India

## Dr. Pavan Sable

Assistant Professor, Department of  
Community Medicine, Seth G.S.  
Medical College & K.E.M.  
Hospital, Mumbai, Maharashtra,  
India

## Dr. Milind Ubale

Professor and Head, Department  
of Microbiology, Rajiv Gandhi  
Medical College, Chhatrapati  
Shivaji Maharaj Hospital, Thane  
Belapur road, Kalwa, Thane,  
Maharashtra, India

## Correspondence

### Dr. Sunita Gaikwad

Associate Professor, Department of  
Obstetrics and Gynaecology, Rajiv  
Gandhi Medical College,  
Chhatrapati Shivaji Maharaj  
Hospital, Thane Belapur Road,  
Kalwa, Thane, Maharashtra, India

## Retrospective analysis of Twin pregnancies -Types of placentation and its association with perinatal outcome

Dr. Mamta Ramteke, Dr. Sunita Gaikwad, Dr. Pavan Sable and Dr. Milind  
Ubale

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### Abstract

**Background:** Twin pregnancies are associated with significantly higher morbidity and mortality than are singleton pregnancies. Twin gestation, a high-risk pregnancy is responsible for 10% of all perinatal mortalities. In addition, there is significant morbidity in terms of discordant growth, premature deliveries, and requirement of neonatal intensive care. The diagnosis of chorionicity is important because the adverse perinatal outcome depends upon the chorionicity. Monochorionic twins are at higher risk than dichorionic twins for perinatal mortality and morbidity. Also, chorionicity may be determined antenatally and used for the clinical management of the fetus and early fetal surveillance.

### Aims and objectives:

1. To study the perinatal outcome in twin pregnancies and its association with demographic factors.
2. To analyze and compare perinatal outcome in twin Monochorionic and dichorionic pregnancy.

**Material and Methods:** The study was retrospective, observational study conducted in Tertiary Care Hospital in Mumbai in 2018. The hospital records of the twin pregnancies delivered were studied. The sample size was 50 (N=50) and it included both Monochorionic and dichorionic pregnancies. The patients with maternal co-morbidities like DM or other systemic illness were excluded from the study. The patients were divided into two groups, depending upon the chorionicity that is Monochorionic or dichorionic twins. The demographic and epidemiological factors like age, parity, etc. were studied. The perinatal outcome was then analysed in terms of type of delivery, gestational age at delivery birth weight and condition at discharge.

**Statistical analysis:** Data was entered in Microsoft Excel and analyzed. The descriptive statistic were used to compare the various outcomes in Monochorionic and dichorionic twin pregnancy. Chi square test, student t test were used to compare difference in both groups. A p value >0.05 was considered as statistically significant.

**Conclusion and Recommendations:** The perinatal mortality and morbidity is high in Monochorionic pregnancy as compared to dichorionic pregnancy in twin deliveries. The knowledge of monochorionicity and dichorionicity in early pregnancy may be helpful to know the type of placentation and the subsequent perinatal outcome.

**Keywords:** Perinatal, monochorionic diamniotic (MCDA), dichorionic diamniotic (DCDA)

### Introduction

Twin pregnancies account for 2 to 4% of the total number of births [1-3]. The twin pregnancy prevalence rates is less than 8 twin pregnancies per 1,000 births in the East, Southeast and Southern Asia, including India [4].

Incidence of twin deliveries may be influenced by both environmental and racial factors. It is the highest among the Negroes especially the Yoruba tribe in Nigeria, lowest in the Asian mongoloids, and intermediate in the Caucasians. Even among the Caucasians, Afro-Americans have a higher incidence than their fellow Caucasians [5].

The incidence of multiple pregnancies worldwide has increased substantially in recent decades with the development of the assisted reproduction techniques (ART). This is because the initial step in ART always involving controlled ovarian hyperstimulation, resulting in the availability of multiple embryos [6].

Due to inherent biological factors, twin pregnancies have increased rates of obstetric and perinatal complications, which may lead to maternal and perinatal mortality. Furthermore, multiple pregnancies in developing countries, due to lack of infrastructure and specialized health care, expose mother and infants to extremely high risks [7].

Multiple births, including twin births can contribute significantly to maternal and perinatal morbidity and mortality.

Twin pregnancy results from a complex interaction of genetic and environmental determinants (maternal age, parity, family history of multiple pregnancies, etc.) and its incidence is rising globally. Among twin pregnancies, Monochorionic twins have a 3-10-fold higher perinatal mortality and morbidity than dichorionic twins. This is largely attributable to their common vascular architecture and the high rate of discordant foetal growth, growth restriction and congenital abnormalities [8].

The present study was undertaken to found out the epidemiological factors associated with twin pregnancy and also to compare the perinatal outcome of twin pregnancies in terms of type of delivery, gestational age at delivery, birth weight and neonatal mortality.

**Material and Methods**

The study was retrospective, observational study conducted in Tertiary Care Hospital in Mumbai in 2018. The hospital records of the twin pregnancies delivered were studied. The sample size was 50 (N=50) and it included both monochorionic and dichorionic pregnancies. The patients with maternal comorbidities like DM or other systemic illness were excluded from the study. The patients were divided into two groups, depending upon the chorionicity that is monochorionic or dichorionic twins. The demographic and epidemiological factors included in the present study are age, parity, etc. The perinatal outcome was then analysed in terms of type of delivery, gestational age at delivery, birth weight and Neonatal mortality.

**Statistical analysis**

Data was entered in Microsoft Excel and analyzed. The descriptive variables were expressed as mean, SD and range; the categorical data were expressed as proportion. Chi square test, student t test and descriptive statistic were used to compare the various outcomes in monochorionic and dichorionic twin pregnancy.

**Results and Discussion**

**Table 1:** Association of Epidemiological factors with Type of Placenta in Twin pregnancies

Variable	MCDA (N=23)	DCDA (N=27)	p value
<b>Age of the patient</b>			
Less than 25 Years	2	1	0.2682
25 Years to 30 Years	17	16	
More than 30 Years	4	10	
<b>Parity</b>			
Primigravida	12	19	0.3205
Gravida 2	6	3	
Gravida 3 or more	5	5	
<b>Type of Labour</b>			
Term	7	19	0.0048
Preterm	16	8	
<b>Mode of delivery</b>			
Vaginal	14	5	0.0120
Emergency LSCS	6	9	
Elective LSCS	2	10	
Forcep and Vacuum	1	3	

In the present study, maximum patients belonged to the age group (25-30 Years) viz 66% of the total patients. Age more

than 30 years was more common in DCDA group, as compared to MCDA group.

Most of the twin pregnancies, in the present study, were primigravida (62%); Gravida 3 status or more were also common (20%).

Type of Labour and type of Placenta (MCDA or DCDA) showed statistically significant association ( $p<0.05$ ); DCDA group showed more term labour whereas MCDA group had more preterm deliveries.

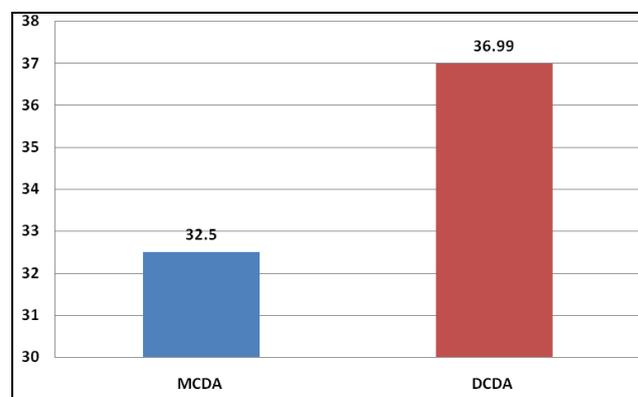
DCDA type of placenta group showed more LSCS deliveries (Emergency and Elective) as compared to MCDA group. MCDA group showed more vaginal deliveries (60%). The association between type of placenta and mode of delivery was statistically significant ( $p<0.05$ ). The Forcep and Vacuum deliveries were common in DCDA group.

**Table 2:** Comparison of the Gestational Age in weeks (Mean, SD) at delivery among the groups

Type of Placenta	Mean Gestational Age in Weeks (mean± SD)	p value#
MCDA (N=23)	32.50 ± 05.02	0.0002
DCDA (N=27)	36.99 ± 01.73	

#Student 't' Test is used, statistically significant

The present study showed that the mean gestational age among MCDA group was 32.50 weeks, which was less as compared to 36.99 weeks among DCDA group and the difference was statistically significant ( $p<0.05$ ).



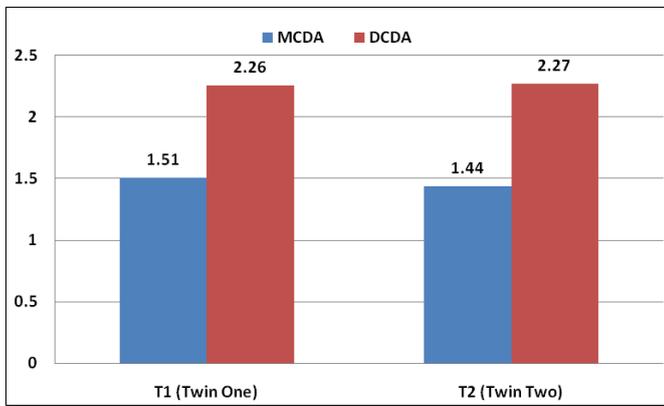
**Fig 1:** Mean gestational age in weeks in MCDA and DCDA

**Table 3:** Comparison of the Birth weight (mean, SD) among the groups

Type of Placenta	Birth Weight in kg (mean ± SD)			
	N	T1*	N	T2*
MCDA	23	01.51 ± 00.77	22	01.44 ± 00.69
DCDA	27	02.26 ± 00.35	27	02.27 ± 00.36
p Value#		0.0001		0.0000

(T1\*- Twin One, T2\*- Twin Two, #Student 't' Test is used)

This result revealed that, the mean birth weight among MCDA group was 1.51 kg, which was significantly less as compared to 2.26 kg among DCDA group for T1. Similarly, for T2 the mean birth weight among MCDA group was 1.44 kg, which was significantly less as compared to 2.27 kg among DCDA group. The difference in Birth weight in T1 (Twin One) and T2 (Twin Two) among MCDA and DCDA groups was statistically significant ( $p<0.05$ ).



**Fig 2:** Mean birth weight in kg among MCDA and DCDA groups

**Table 4:** Type of placenta and Neonatal deaths

Type of Placenta	Neonatal Deaths
MCDA (N=23)	05
DCDA (N=27)	-

In the above result, 21.7% of the participants among MCDA group had neonatal deaths, whereas not a single case was observed among DCDA group.

### Discussion

Multiple pregnancies is now occurring in an increased frequency with the increased use of newer assisted reproductive techniques. However twin pregnancies are associated with significantly higher morbidity and mortality than are singleton pregnancies. Scientific literature suggests that the risk is five times to six-fold higher morbidity and mortality in twin pregnancies [9, 10].

In the present study, the most common age group for twin pregnancies was 25-30 years; although patients with age more than 35 were also common (20%).

It is well documented that an advanced maternal age is one of the important independent risk factor for twin pregnancies [11, 12]. Advanced maternal age and twin pregnancies are both independent risk factors for adverse pregnancy outcomes. Advanced maternal age (AMA), defined as age 35 or older, is associated with increased risk for spontaneous and indicated preterm birth, fetal death, aneuploidy, and maternal complications [13-15].

Although, most of the study participants in the present study were primigravida (62%), parity status plays in important role. Parity is also documented as an important risk factor for development of twin pregnancies [16].

Another study documented the maternal characteristics of twin pregnancies as- mothers of twins were older, less educated, of higher parity and received slightly less antenatal care [7].

Monochorionic (MC) twins have a 3-10-fold higher perinatal mortality and morbidity than dichorionic twins. This is largely attributable to their common vascular architecture and the high rate of discordant fetal growth, growth restriction and congenital abnormalities [8] Monochorionic twins are at further risk for type-specific perinatal complications, for example, twin-twin transfusion syndrome. Precise first-trimester depiction of chorionicity has enabled early antepartum stratification of twin gestations according to chorionicity, in comparison with previous later (mid- and third-trimester) ultrasonographic diagnosis of chorionicity.

In the present study, out of total 50 twin pregnancies, 23 (46%) had monochorionic (MCDA) and 27 (54%) had dichorionic type of placenta (DCDA). The mean gestational age at births in weeks and Birth weight of T1 (Twin One) and T2 (Twin Two) is

higher and statistically significant in DCDA group ( $p < 0.05$ ).

Another studies also reported that Monochorionic twin pregnancies had a higher incidence of preterm birth ( $p < 0.008$ ), twin-twin transfusion syndrome (TTTS), and intrauterine growth restriction (IUGR) ( $p < 0.05$ ). MC pregnancies had lower neonatal birth weight ( $p < 0.05$ ), and lower Apgar score [17].

Another study has also reported that monochorionic placenta as a significant risk factor for preterm twin birth [18].

Also, in our study the dichorionic twins were found to be heavier than monochorionic twins (T1 and T2) as evident from the difference in their average birth weights ( $p < 0.05$ ). Similarly, another research study that mean birth weight was 221gm higher in dichorionic as compared to monochorionic twins [19]

Our study showed significantly less number of twins in MCDA group (78% in T1 and 60% in T2) were alive and went home as compared to no mortality in DCDA group. The mortality is higher in MCDA group as compared to DCDA group. Another study findings also suggest that the stillbirth rate for monochorionic twins was 3.6-fold than that for dichorionic twins [20].

### Conclusion and Recommendations

Our findings suggest that maternal and perinatal morbidity and mortality associated with twin births in low-resource settings is significant, and twin pregnancy poses an intrinsic risk to both mothers and neonates. Furthermore, The perinatal mortality and morbidity is high in monochorionic pregnancy as compared to dichorionic pregnancy in twin deliveries.

The knowledge of monochorionicity and dichorionicity in early pregnancy may be helpful to know the type of placenta and the subsequent perinatal outcome. Focused interventions to improve antenatal, delivery and postnatal care in twin pregnancies should be considered a priority in strategies to reduce overall morbidity and mortality.

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