A Study on Maternal Morbidity of Twin Pregnancies in a Tertiary Care Centre

Gigi A.¹, Priyadarsini S.²

¹Department of Obstetrics and Gynaecology, TDMCH, Alappuzha, Kerala, India.

²Department of Obstetrics and Gynaecology, GMC, Trivandrum, Kerala, India.

ABSTRACT

BACKGROUND

Twin pregnancy is associated with a high risk of maternal morbidity and mortality. Gestational hypertension, preterm labour, preterm premature rupture of the membranes (PPROM), and postpartum haemorrhage (PPH) are higher in twins. However, little is known about the differences in maternal risks in monochorionic and dichorionic twins. We wanted to study the effect of chorionicity on maternal complications.

METHODS

A prospective, descriptive study was conducted in the Department of Obstetrics and Gynaecology, TDMC, Alappuzha for eighteen months. All patients with twin pregnancies admitted to TDMC, Alappuzha with gestational age of more than 24 weeks were included in the study.

RESULTS

The incidence of twin pregnancy was 1.5 %. The incidence of monochorionic twins was 38.7 % and dichorionic twins was 61.3 %. Preterm labour was the commonest complication in both monochorionic and dichorionic twins and the incidences were comparable. Maternal pyrexia, UTI, PPH and postpartum depression were the common maternal morbidities encountered in both groups. The incidence of PPH was 10 % in monochorionic twin pregnancies and 5 % in dichorionic twin pregnancies. Maternal bed days for dichorionic twins were higher than monochorionic twins.

CONCLUSIONS

Preterm labour was the commonest complication in both types of twins with comparable incidence. Gestational hypertension was the second common complication in both. Caesarean section rate was higher in dichorionic twins than monochorionic twins i.e., 63 vs. 41.5. Maternal pyrexia was found in 12 % of cases, the most common postpartum morbidity. Mean maternal bed days for dichorionic twins were found to be higher than monochorionic twins. 13.4 vs. 8.85.

KEY WORDS

Twins, Monochorionic, Dichorionic, Maternal Morbidity.

Corresponding Author:

Dr. Gigi A.,

Chris Land, Kochikaran,

Alappuzha-688007, North P. O.,

Kerala, India.

E-mail: gigiantony100@gmail.com

DOI: 10.14260/jemds/2021/791

How to Cite This Article:

Gigi A, Priyadarsini S. A study on maternal morbidity of twin pregnancies in a tertiary care center. J Evolution Med Dent Sci 2021;10(45):3915-3919, DOI: 10.14260/jemds/2021/791

Submission 02-12-2021,

Peer Review 19-12-2021,

Acceptance 22-12-2021,

Published 28-12-2021.

Copyright © 2021 Gigi A. et al. This is an open access article distributed under Creative Commons Attribution License [Attribution 4.0 International (CC BY 4.0)]

BACKGROUND

Few topics in obstetrics have stimulated more interest and generated more literature than multiple gestations. Multiple gestations are the simultaneous development of more than one foetus in the uterus.¹ Twins contribute 94 % of multifetal gestation. Twins are of two types: Dichorionic (DC) and monochorionic (MC) depending upon the number of the placenta.² Another classification is based on fertilization. Dizygotic twins (70 %) result from fertilization of two ova by two sperms. Monozygotic twins (30 %) arise from fertilization of one ovum with one sperm, followed by early cleavage into two halves which develop further separately. Depending upon the timing of the twinning process monozygotic twins are of four types, monozygotic dichorionic diamniotic twins (30 %), monozygotic monochorionic diamniotic twins (70 %), monozygotic monochorionic monoamniotic twins < 1 %, conjoint twins extremely rare. Determination of chorionicity is by ultrasonography and it is highly sensitive when performed before 14 weeks.

The incidence of twin pregnancy varies greatly in different parts of the world largely due to variations in dizygotic twinning. Incidence in dizygotic twinning is influenced by race, heredity, maternal age, parity, and fertility drugs. The incidence of monozygotic twinning appears to be constant. Historically rate of twinning in black mothers has been substantially higher than the other ethnic groups. But the difference has narrowed down over the last two decades. The family history of the mother is more important than that of the father. Older maternal age alone is believed to account for one fourth to one-third of the rise in twins. The incidence of twins is on the rise due to an increase in divorce and subsequent remarriage with many women starting a new family at an older age.

Twin pregnancies are associated with significantly higher morbidity and mortality for the mother than singleton pregnancies. There is a significantly increased risk of gestational hypertension and preeclampsia in twins. The risk of gestational hypertension is between 10 and 20 percentage in twins according to various studies. The overall rate of preeclampsia is around 9.5 % and it is two to three-fold higher than singleton pregnancies. Postpartum haemorrhage, maternal deaths were increased twofold in twin pregnancies. Most importantly in twins, preeclampsia occurs at earlier gestational age and has a more severe form. The reason behind these complications is attributed to increased placental mass leading to increased circulating levels of soluble fms-like tyrosine kinase-1 (sFlt1). sFlt1 is a circulating antiangiogenic molecule of placental origin that plays a central role in preeclampsia by antagonizing placental growth factors and vascular endothelial growth factors present in the maternal vasculature. Atypical presentation of preeclampsia is also more common. Preterm labour occurrence in a twin is nearly 50 % and 10 % of them are delivered before 32 weeks. The aetiology behind spontaneous preterm birth is likely multifactorial and remains largely unknown. Increased uterine distention, cervical insufficiency, and intrauterine infections are the different proposed pathological mechanisms. Twins are associated with a higher rate of obstetrical interventions. This may lead to iatrogenic preterm

labour. According to different studies, one-third of preterm birth is medically indicated. This can have a huge emotional impact on the mother precipitating to have postpartum depression, post-traumatic stress disorder and anxiety. This will directly increase maternal bed day's financial burden.

Anaemia is one of the common complications of twin pregnancy. Due to greater maternal blood cell mass, plasma volume expansion increases foetal and placental requirements and also nausea and vomiting in pregnancy. Maternal iron demand increases to 1.8 times compared to singletons. Placental abruption, antepartum haemorrhage, antepartum thromboembolism, post-partum thromboembolism, increased dependent oedema and a greater propensity for pulmonary oedema are less common complications.

Early pregnancy complications like hyperemesis gravidarum, threatened abortion, evacuations of retained products are high compared to singleton pregnancies. Intrapartum and postpartum complications of twins include increased operative vaginal delivery, preterm and term caesarean sections, combined vaginal and abdominal delivery, manual removal of placenta, primary postpartum haemorrhage, postpartum infections, secondary postpartum haemorrhage, and blood transfusion. Peripartum hysterectomy rate was also high i.e. twofold.³

Women pregnant with twins are nearly six times more likely to be hospitalized during pregnancy, with complications such as preterm labour, gestational hypertension, ppprom and are more likely to be admitted to ICU.⁴ Maternal length of stay during the birth admission is 60 to 70 % higher for multiple versus singleton births. Lastly, compared with singleton mothers, twin mothers are at increased risk for depression.⁵ Carrying twin pregnancies predispose to several pregnancy complications and somehow show a rising trend.

Objectives

To compare the antenatal, intrapartum and postpartum complications of the mother with respect to chorionicity.

METHODS

It is a prospective observational study conducted in the Department of Obstetrics and Gynaecology, TDMC, Alappuzha from 6th June 2006 to 6th December 2007

Ethics committee approval was obtained from the institutional ethical committee prior to commencement of the study and informed consent was taken from all the participants.

Sample Size

106 women with twin pregnancies participated in this study.

Inclusion Criteria

All patients with twin pregnancies were admitted to TDMC, Alappuzha with a gestational age of more than 24 weeks.

Exclusion Criteria

Patients or babies referred to higher centres were excluded as they were not available for follow up. Patients who did not give consent were also excluded. They were followed up from the antenatal period, after admission to the antenatal ward and labour room. They were categorized into monochorionic and dichorionic twin pregnancies based on early ultrasound findings. A proforma was used to collect data. The questionnaire sought information with regard to age, gravida, para, maternal complication, previous obstetric outcome, gestational age, mode of delivery, birth weight of baby, Apgar at 1' and 5' IBN admission, and anomalies.

In labour, the patient was watched for progress. Once the first twin was delivered, per abdominal examination and per vaginal examination were repeated and delivery of the second twin was facilitated. Blood was arranged in all cases and active management of the third stage was practised.

The chorionicity of the placenta was confirmed after the delivery of both babies. Apgar scores of babies were noted 1' and 5'. Maternal complications of monochorionic and dichorionic twin pregnancies were compared.

Statistics

Data were entered using Microsoft Excel and analyses were done using SPSS 16. Qualitative variables were expressed as frequency and percentage. Quantitative variables were expressed as mean and standard deviation and were compared using an independent t-test. A P-value < 0.05 was considered to be statistically significant.

RESULTS

Characteristics	Monochorionic (N=41) n (%)	Dichorionic (N=65) n (%)
Maternal Age	<20 years 1 (2.4%)	2 (3.1%)
	20-24 years 22 (53.7%)	26 (40%)
	25-29 years 12 (29.3%)	27 (41.5%)
	>30 years 6 (14.6%)	10 (15.4%)
Gravidity	Primi 23 (56.1%)	30 (46.2%)
	Multi 18 (43.9%)	35 (53.8%)
	P0 24 (58.5%)	34 (52.3%)
Parity	P1 15 (36.6%)	27 (41.5%)
	P2 2 (4.9%)	4 (6.2%)
	Present 9 (22%)	21 (32.3%)
History of ovulation induction	Absent 32 (78%)	44 (67.7%)

Table 1. Demographic and Clinical Characteristics

Graph 1. Distribution of Twins

Delivery Details	Monochorionic (N=41) n (%)	Dichorionic (N=65) n (%)
Vaginal delivery	21 (51.2%)	21 (32.3%)
Vaginal delivery - 1st	3 (7.3%)	3 (4.6%)
Vx- Assisted Breech	2 (4.9%)	11 (16.9%)
Elective LSCS	15 (36.6%)	29 (44.7%)
Emergency LSCS	-	1 (1.5%)
For 2nd twin	23 (56.1%)	28 (43.1%)
Vx-Vx	7 (17%)	13 (20%)
Non Vx Others	11 (26.8%)	24 (36.9%)
1st Breech	7 (41.2%)	18 (43.9%)
Previous LSCS	2 (11.8%)	11 (26.8%)
Placenta previa	1 (5.9%)	1 (2.4%)
Others	7 (41.2%)	11 (26.8%)

Table 2. Delivery Details

	Monochorionic Mean ± SD	Dichorionic Mean ± SD	P-Value
Gestational age	34.78 ± 3.24	35.91 ± 2.36	0.058
Maternal bed days	8.85 ± 4.45	13.4 ± 1.3	0.002*

Table 3. Gestational Age and Maternal Bed Days

*indicates statistically significant difference

Complications	Monochorionic (N=41) N (%)	Dichorionic (N=65) n (%)
Preterm labour	19 (46.3%)	26 (40%)
PIH	16 (39%)	22 (33.8%)
PPROM	7 (17.1%)	8 (12.2%)
Anaemia	4 (9.7%)	7 (10.7%)
Placenta previa	1 (2.4%)	7 (10.7%)
G D M	2 (4.9%)	4 (6.2%)
Hypothyroidism	1 (2.4%)	3 (4.6%)
Maternal pyrexia	12 (29.2%)	11 (16.9%)
UTI	4 (9.7%)	5 (7.6%)
Wound dehiscence	1 (2.4%)	-
PPH	6 (15%)	3 (5%)
Postpartum depression	1 (2.4%)	4 (6.1%)

Table 4. Maternal Complications

DISCUSSION

The total number of deliveries during the study period was 8125. Out of this 121 were twins and three were triplets. The incidence of twin pregnancy was 1.5 %. Graph -1 shows the distribution of monochorionic and dichorionic twins as 38.7 % versus 61.3 %.

	MC	DC
Ruhle et al ⁶	33	67
Hatkar PA et al ⁷	29	71
Muhmut et al ⁷	30.7	69.3
This study	38.7	61.3

Incidences of dichorionic and monochorionic twins in similar studies are given. Table I shows the distribution of maternal age, gravidity and parity.

Study	MC	DC
Hatkar PA et al ⁷	23	24
Present study	25.12	26.82

The results of both studies are comparable; maximum incidence of monochorionic twin pregnancy was in the age group of 20-24 years. In dichorionic twins, a higher incidence was in the age group of 25-29 years. The older mean age in the dichorionic twin pregnancy may be due to a prolonged period of infertility and treatment with ovulation induction. Monochorionic twins had 56.1 % incidence in primis and in dichorionic twins, the incidence in primis was 46.2 %. There was only one 4th gravida in the entire study group. Increased incidence in primigravida was because they accounted for the

largest % in the study and also because of infertility. Nullipara contributed the largest group in both monochorionic and dichorionic pregnancies. There was no grand multipara in the study group. The reason for this could be the implementation of an effective family planning method. 22 % of monochorionic twins had ovulation induction whereas 32.3 % of dichorionic twins had ovulation induction. In the study conducted by Mahmut et al.,⁷ the incidence of ovulation induction was 15 %.

Table II shows the distribution of the presentation. Vx-Vx is the commonest presentation in both groups, nearly 50 %. Second, comes vertex-breech presentation. Incidence of 1st baby in a non-vertex presentation in monochorionic twins was 26.8 % and that of dichorionic twins was 36.9 %, contributing a major indication for caesarean section. In monochorionic twins, vaginal delivery was the mode of delivery in more than half of the cases (58.2 %). In dichorionic twins, the incidence of vaginal delivery was only 40 % and that of caesarean section was 61.5 %. The incidence of caesarean section in monochorionic twins was 41.5 %.

Study	MC	DC
Hatkar PA et al ⁷	29.3	34.5
This study	41.5	61.5

The higher incidence of caesarean section in dichorionic twins was due to the high ratio of non-vertex presentation of 1st twin (36.9 %) and higher incidence of previous caesarean section cases. The commonest indication for a caesarean section of the monochorionic twins was the non-vertex presentation of 1st baby. Another rare indication i.e., single foetal demise was 17.6 %. In monochorionic twins, the vertex-breech presentation had a vaginal delivery of the 1st twin and assisted breech delivery of the 2nd twin in 3 out of 6 cases without any complication. In dichorionic twin pregnancy, 3 out of 13 vertex breech presentation had a vaginal delivery of the 1st twin and assisted breech delivery of the 2nd twin. Emergency LSCS was done in 36.6 % of monochorionic twins and 44.7 % of dichorionic twins. Elective LSCS was done in 4.9 % of monochorionic twins and 16.9 % of dichorionic twins. In this study, there were two monochorionic monoamniotic twins, emergency LSCS was done for one at 34 weeks, and the indication was preterm premature rupture of membranes. In the second case, monoamniotic status was identified after vaginal delivery. As there was cord entanglement and no separating membrane, caesarean section rate was high in both groups compared to singleton.

Table III shows the average gestational age at delivery, 34.9 for monochorionic twins and 35.9 for dichorionic twins and was comparable. Maternal bed days were significantly higher compared to the singleton. Mean maternal bed days of monochorionic twin pregnancies were 8.85 days and that of dichorionic twins were 13.4. Dichorionic mothers had a longer hospital stay in this study.

Table IV shows the incidence of maternal complications. Preterm labour was the commonest maternal complication encountered in both groups. 46.3 % in monochorionic and 40 % in dichorionic twins and it was comparable. Cumulative incidence of preterm birth in both groups was found in the various studies given below. There was an inherited risk of preterm delivery in twins due to stretching resulting in spontaneous preterm delivery. Twin pregnancy is associated

with multiple maternal and foetal complications like preterm premature rupture of membranes, gestational hypertension preeclampsia, antepartum haemorrhage, eclampsia, foetal growth restriction, intrahepatic cholestasis of pregnancy and acute fatty liver of pregnancy. Unique complications of monochorionic twins include twin transfusion syndrome, single foetal demise. Anaemia-polycythaemia sequence also necessitates early delivery; all these lead to induction of labour or preterm caesarean section increasing the incidence of preterm babies. In this study, monochorionic twins showed a slightly higher incidence of preterm delivery.

Mahmut et al ⁸	41%
Annu Rikka et al ⁹	49%
Dubey S, et al ¹⁰	70%
Present study MC	46.3
DC	40

Gestational Hypertension

16 out of 41 monochorionic twins and 22 out of 65 dichorionic twins had gestational hypertension. Similar studies confirmed significantly increased risk of both gestational hypertension and preeclampsia in twins compared to a singleton.

Annu Rikka et al ⁹	26%
Dubey S, et al ¹⁰	28%
Present study MC	39 %
DC	33%

In this study, women with monochorionic twin pregnancy showed a higher incidence of gestational hypertension compared to dichorionic twins. Compared to other similar studies this study showed a higher rate.

Anaemia was detected in around 10 % of both groups. A similar study conducted in other parts of India showed a much higher incidence of nearly 60 %. This may be due to a good literacy rate and strong public health care system which are pivotal in creating awareness about pregnancy-related issues.

The incidence of PPRM and gestational diabetes mellitus was comparable in both groups. Maternal pyrexia was the commonest morbidity seen in both groups. One of the reasons for hyperpyrexia was the prophylactic use of prostaglandin E1 for PPH. Incidence of PPH was less than anticipated due to active management of 3rd stage. Postpartum blues/depression was present in 2.4 % of monochorionic twins and 6.1 % of dichorionic twins.

CONCLUSIONS

Preterm labour, gestational hypertension, anaemia, maternal pyrexia, UTI, PPH and postpartum depression were the common maternal complications encountered in both groups. Operative delivery and maternal bed days for dichorionic twins were higher than monochorionic twins. The maternal risks associated with twin pregnancies are related to the physiology of twin uterus and placentation, but factors like, ovulation induction, in-vitro fertilization, advanced maternal age, high BMI, labour induction and operative delivery are also on the rise which further predispose to complications during pregnancy and childbirth. Early identification of risk

factors and more research are needed for optimum outcome and to determine the role of chorionicity in maternal complication.

Data sharing statement provided by the authors is available with the full text of this article at jemds.com.

Financial or other competing interests: None.

Disclosure forms provided by the authors are available with the full text of this article at jemds.com.

REFERENCES

- [1] Martin JA, Curtin SC, Hamilton BE, et al. Birth: Final data for 2000. National Vital Statistics Reports 2002;50(5).
- [2] Derom C, Vlietinck R, Derom R, et al. Increased monozygotic twinning rate after ovulation induction. *Lancet* 1987;1(8544):1236-8.
- [3] Sibai B, Hauth J, Caritis S, et al. Hypertensive disorders in twin versus singleton gestation. National Institute of Child Health and Human Development Network of Maternal-Fetal Medicine Units. *Am J Obstet Gynaecol* 2000;182(4):938-42.
- [4] Cerningham FG, Gant NF, Leveno KJ. *Willam's obstetrics*. 21st edn. McGraw-Hill Education 2010:767-800.
- [5] Gabbe SG, Niebyl JR, Simpson JL. *Obstetrics: normal, and problem pregnancies*. 2nd edn. Churchill Livingstone 1991.
- [6] Guaschino S, Spinillo A, Stola E, et al. Growth retardation, size at birth and perinatal mortality in twin pregnancy. *Int J Gynaecol Obstet* 1987;25(5):399-403.
- [7] Hatkar PA, Bhide AG. Perinatal outcome of twins in relation to chorionicity. *J Postgrad Med* 1999;45(2):33-7.
- [8] Erdimoolu M, Kale A, Akdeniz N, et al. Retrospective analysis of multiple pregnancies. *Perinatal Journal* 2005;13(4):213-7.
- [9] Rissanen ARS, Jernman RM, Gissler M. Maternal complication in twin pregnancies in Finland during 1987 to 2014: a retrospective study. *BMC Pregnancy and Childbirth* 2019;19:337.
- [10] Dubey S, Mehra R, Goel P, et al. Maternal complications in twin pregnancy; recent trends: a study at a tertiary care referral institute in Northern India. *Int J Reprod Contracept Obstet Gynecol* 2018;7(9):3753-7.