

Original Research Article

Foeto-Maternal Outcome of Twin Pregnancy

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ABSTRACT

Background

Twin pregnancy is the most common multiple gestation in clinical practice. Timely management by specialist and improvement in neonatal care facilities improve the outcome of twin pregnancy. Studies show that the risk of miscarriage, preeclampsia, polyhydramnios, preterm labor, abnormal vascular communication, fetal malformation, discordant fetal growth, cord complications, still birth, increased rate of cesarean section, abnormal iron and folic acid deficiency anemia, postpartum hemorrhage and maternal death were higher in multifetal pregnancy compared to singleton pregnancy. In this study we wanted to evaluate the fetomaternal outcome in twin pregnancy.

Methods

This cross-sectional study was carried out in the Department of Obstetrics & Gynaecology, RIMS (Regional Institute of Medical Sciences), Imphal. This study was conducted on all the cases of twin pregnancies admitted in the Department of Obstetrics & Gynaecology, RIMS, Imphal. All eligible participants were selected consecutively. History and clinical examination, along with obstetric and fetal parameters, were recorded.

Results

After adjusting for factors, the result shows that compared to primiparous mothers, mothers with parity 1 and 2 or more were 79 and 94 percent less likely to give birth to both twins with low birthweight, respectively, and the difference was found to be statistically significant ($p = 0.020$ and 0.001).

Conclusions

The most common maternal complications of twin pregnancy are hyperemesis gravidarum, preterm labor, hypertensive disorder, and PROM. While observing the adverse outcomes, the risk factors that had a significant effect on preterm birth and low birth weight were booking status, literacy, parity, type of placenta, presentation of fetuses, preterm labor and the presence of polyhydramnios.

Keywords: Feto-Maternal Outcome, Twin Pregnancy, Preterm Labour, PROM.

INTRODUCTION

There has been an extraordinary increase in multifetal gestations, of which twin pregnancy is the commonest. Twin pregnancy is considered high-risk because of its significant impact on maternal and fetal outcomes.^[1] Despite having good antenatal care worldwide, it has long been recognized as a high-risk pregnancy.^[2,3] Twin pregnancy is the most common multiple gestation in clinical practice.^{3,4} Timely management by specialists and improvement in neonatal care facilities improve the outcome of twin pregnancy.^[1]

Twin pregnancy occurs 1 in 80 pregnancies, accounting for preterm birth (12.2%) and neonatal death (15.4%) as compared to singleton pregnancy. Twin pregnancies have a higher risk of miscarriage, pre-eclampsia, postpartum hemorrhage, preterm labor, anemia, polyhydramnios, fetal malformation, stillbirth, an increased rate of caesarean section, etc.^[5] A study also found that one-fourth of very low birthweight neonates (birthweight less than 1500 gram) are outcomes of multifetal gestation.^[6]

Twin pregnancy is the most common variety of multifetal pregnancy encountered in clinical practice, resulting from the simultaneous development of two fetuses in the uterus, which is also considered a high-risk pregnancy.^[3] Compared to singleton pregnancy, multiple or twin pregnancy has an increased obstetric and perinatal complications.⁷ The incidence of congenital malformation is higher in twins, and the rate was 406 per 10,000 twins against 238 per 10,000 singletons. The malformation rate was two times higher in monochorionic twins than dichorionic twin pregnancies. However, with increased availability of ART, there is a rise in the risk of congenital malformation among dizygotic twins.^[8,9]

Studies show that the risk of miscarriage, preeclampsia, polyhydramnios, preterm labor, abnormal vascular communication, fetal malformation, discordant fetal growth, cord complications, stillbirth, increased rate of cesarean section, abnormal iron and folic acid deficiency anemia, postpartum hemorrhage and maternal death were higher in multifetal pregnancy compared to singleton pregnancy.^[7,10] In view of the rising incidence of multifetal gestation globally, this study was conducted to assess the foeto maternal outcomes of twin pregnancies delivered at the RIMS obstetrics and gynaecology ward.

AIM AND OBJECTIVES

The aim of the study was to evaluate the foeto maternal outcome in twin pregnancy.

MATERIALS AND METHODS

This cross sectional study was carried out in the Department of Obstetrics & Gynaecology, RIMS (Regional Institute of Medical Sciences), Imphal, on all the cases of twin pregnancies admitted in the Department of Obstetrics & Gynaecology, RIMS, Imphal, during the period of one and a half years (starting from September 2018 to February 2020).

Pregnant mothers with medical and surgical problems, pregnancy <28 weeks of gestation, and patients who refused to give consent were excluded.

Sample Size

Sample size (N) was calculated based on the formula $N = 4PQ/L^2$, $N = 4 \times 25 \times 75 / 49$, $N = 153.06$, $N = 153$, where, P = Prevalence of premature rupture of membrane in twin pregnancy according to Guerra GV et al²⁴ = 25%; Q = 100-P, and L = 7.

Study Procedure

All eligible participants were selected consecutively. However, those eligible participants during the study period were included for the analysis.

Complete clinical history including age, parity, chief complaints, gestational age or time passed after delivery, history of present illness like history of raised blood pressure, swelling feet, headache, upper abdominal pain, visual disturbances, convulsion, vomiting, urinary problems, sleep disturbances or bleeding per vagina, history of present pregnancy, history of past illness, menstrual history, obstetrical history, family, and personal history were taken from attendants or from the patient if conscious and well oriented to time, place, and person.

A general physical and systemic examination including blood pressure, pulse, temperature, respiratory rate, edema, pallor, jaundice, and dehydration was checked.

For neonates, details of the labor, mode of delivery, birth weight, APGAR score, IUD, prematurity, need for resuscitation, and need for NICU admission were recorded.

Data of the patient were recorded in predesigned proforma enclosed in Annexure II. The particulars, history, investigations, examinations, details, etc. recorded at the relevant time.

Statistical Analysis

Data were checked for consistency and completeness. Descriptive statistics, cross-tabulation, and logistic regression analysis were carried out to fulfill the objectives of the study. Graphical techniques were also used. Statistical software packages SSPS 21 and Microsoft Excel were used to carry out the analysis. A p-value of <0.05 was taken as significant.

Descriptive statistics (univariate and bivariate analysis) were carried out to understand the background characteristics of the study population. For this, variables like religion, age, education, parity, type of admission, mode of delivery, birthweight, presentation, and type of placenta were used.

To understand the fetomaternal outcome of the study sample, viability, birth weight, Apgar score, resuscitation, NICU admission, and early neonatal death were used as fetal outcome variables, and hyperemesis gravidarum, anemia, preterm labor, PROM (Premature Rupture of Membrane), malpresentation of fetuses, polyhydramnios, postpartum hemorrhage and maternal morbidity as maternal outcome variables.

In order to find the factor affecting adverse outcomes (preterm birth and low birthweight), binary logistic regression analyses were carried out. Preterm birth and low birthweight were taken as main dependent variables. Type of admission, age group, religion, education status, parity, hypertension, type of placenta, malpresentation, mode of delivery, history of abortion, hyperemesis gravidarum, anemia, preterm labor, PROM, polyhydramnios, and postpartum hemorrhage were used as independent variables to see the adjusted effect of the outcome variables.

The approval of the protocol of the thesis was taken from the research ethics board, RIMS, Imphal.

RESULTS

The result of the study is based on 110 mothers with twin pregnancies whose gestational age is more than 28 weeks after their last menstrual period and who have given consent for conducting the research, admitted during one and a half years of the study period.

Twin Combination	N/n	Mean Birthweight (in Kg)			P-Value
		1 st Twin	2 nd Twin	Difference	
Overall	110	2.25	2.18	0.07	0.049
Both twin boys	48	2.19	2.21	-0.02	0.751

1st boy and 2nd girl	13	2.55	2.12	0.43	0.001
1st girl and 2nd boy	13	2.10	2.20	-0.10	0.332
Both twin girls	36	2.27	2.15	0.12	0.041
Table 1: Comparison of Mean Birth Weight by Sex Combination of Twins (N = 110)					

It was observed that there was no difference in the birthweight by sex between the first and second twins; however, there was a difference in the mean birthweight by sex between the first and second twins. If the 1st twin was a boy and the 2nd twin was a girl, the mean birthweight was higher (2.6 kg against 2.1 kg, $p = 0.001$), and if both twins were girls, the difference in mean birthweight (1st twin = 2.3 kg and 2nd twin = 2.2 kg) observed was statistically significant at $p = 0.041$ (Table 1).

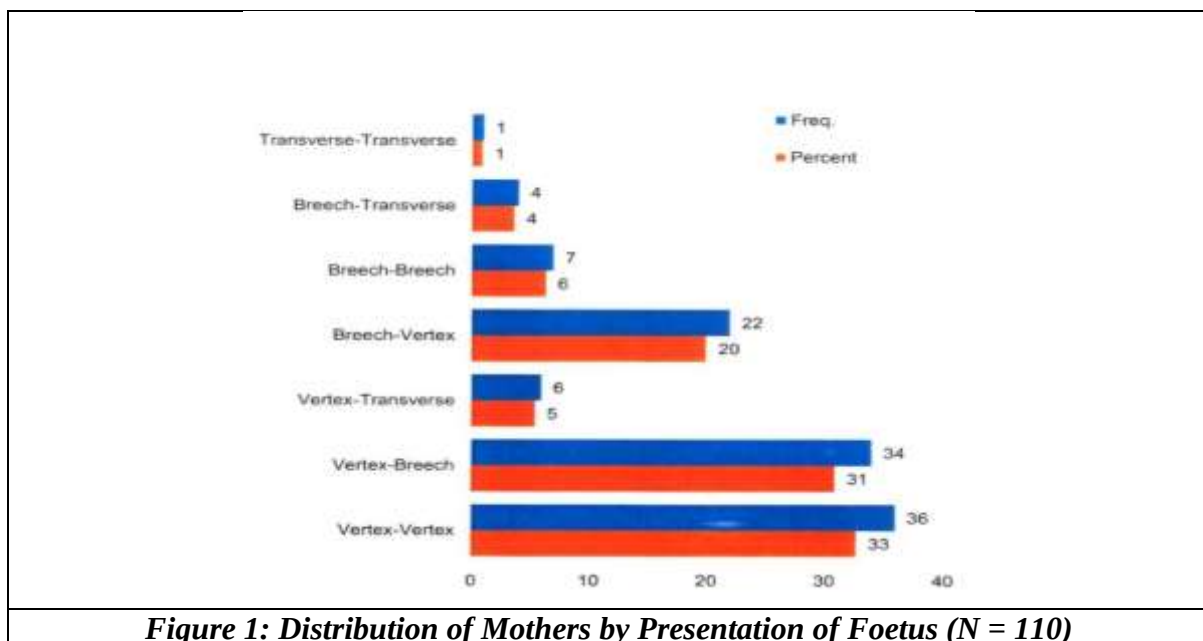


Figure 1: Distribution of Mothers by Presentation of Foetus (N = 110)

Figure 1 shows the distribution of 110 twin pregnancies by type of presentation of the fetus. It was found that the vertex-vertex presentation was the commonest (36 cases), and the transverse-transverse presentation of the fetus was the rarest in the study (1 case). The study found 33 twin deliveries with Breech-Vertex (20%), Breech-Breech (6%), and Breech-Transverse (4%) presentation of fetus delivered by cesarean section.

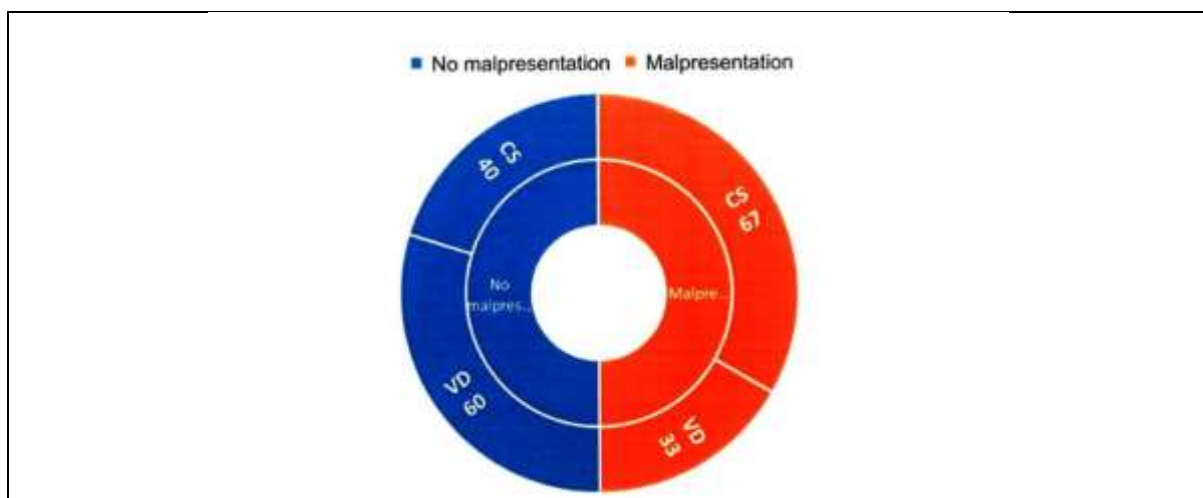


Figure 2: Percentage of Cesarean and Vaginal Deliveries by Presentation of Foetus (N = 110)

Note: CS: Cesarean Section Delivery; VD: Vaginal Delivery

Figure 2 shows the percentage of cesarean and vaginal deliveries by malpresentation status of the fetus. The percentage of cesarean delivery was higher among twins with malpresentation (67%) as compared to twins with no malpresentation (40%). The percentage of vaginal delivery observed was higher among twin pregnancy with no malpresentation (60%) as compared to pregnancy with malpresentation (33%).

The proportion of twins with both boys, boy and girl, and both girls was 44%, 24%, and 33%, respectively. However, the proportion of MCMA type of placenta was found to be as high as 64% among twins with both girls and 50% among twins with both boys. The proportion of DCDA type of placenta was found to be highest among twins with a boy and a girl, which accounts for 62%. There were no cases of MCMA among twins with a boy and a girl, while only 17% of twins each among twins with both boys or both girls were found to have MCMA type of placenta.

Feto Maternal Outcomes

Tables 2a and 2b show the feto-maternal outcomes of twin pregnancies admitted and delivered during September 2018 to February 2020.

	Fetal Outcome	1st Twin		2nd Twin		Both Twin	
		nN	%	N	%	n	%
Viability	Not viable	7	6.36	5	4.55	4	3.64
	Viable	103	93.64	105	95.45	102	92.73
	Birthweight						
	<1.5Kg	7	6.36	8	7.27	5	4.55
	1.5-2.5Kg	74	67.27	81	73.64	63	57.27
	>2.5Kg	29	26.36	21	19.09	13	11.82
APGAR Score	<7	8	7.27	15	13.64	6	5.45
	>=7	102	92.73	95	86.36	93	84.55
Resuscitation	Not required	88	80	78	70.91	72	65.45
	Required	22	20	32	29.09	16	14.55
NICU Admission	No	92	83.64	87	79.09	81	73.64
	Yes	18	16.36	23	20.91	12	10.91
Neonatal Death	No	110	100	107	97.27	107	97.27
	Yes	0	0.00	3	2.73	0	0.00
Table 2a: Fetal Outcomes of Twin Pregnancy (N = 110)							

Fetal Outcome

It was found that of the total twins delivered, viability differed by birth order of the twin. 6% of the 1st twin were not viable, and 5% of the 2nd twin were not viable. Both twins were viable in 93% and not in 3.6%.

Birth weights less than 1.5 kg were 6% among 1st twins and 7% among 2nd twins. 67% of 1st twins and 74% of 2nd twins were having birthweights between 1.5 and 2.5 kg. 26% of 1st twins and 19% of 2nd twins were having birthweight more than 2.5 kg. However, both twins with birthweight less than 1.5 kg were 5%, 1.5 to 2.5 kg were 57%, and more than 2.5 kg were 12%.

APGAR score recorded at 1 minute and 5 minutes of delivery: 92% of 1st twins and 86% of 2nd twins were with APGAR more than or equal to 7. While 6% of twins delivered, both twins had APGAR scores more than or equal to 7. It was also observed that 80% of 1st twins and 71% of 2nd twins required resuscitation. Both twins required resuscitation in about 15% of twins delivered.

Of the total 110 twins, both twins were admitted to the NICU (11%). 16% of first twins and 21% of second twins were admitted to the NICU. The study observed 3 early neonatal deaths in the 2nd twin. (Table 2a).

Maternal Outcome	Categories	(n)	(%)
Hyperemesis Gravidarum	No	76	69.1
	Yes	34	30.9
Anemia	Non anemic ($\geq 11\text{g/dl}$)	12	10.9
	Mild ($10\text{-}10.9\text{g/dl}$)	2	1.8
	Moderate ($7\text{-}9.9\text{g/dl}$)	95	86.4
	Severe ($<7\text{g/dl}$)	1	0.9
Preterm labor	No	73	66.4
	Yes	37	33.6
PROM	No	81	73.6
	Yes	29	26.4
Malpresentation of Fetuses	No	77	70
	Yes	33	30
Polyhydramnios	No	102	92.7
	Yes	8	7.3
Postpartum Hemorrhage	No	103	93.6
	Yes	7	6.4
Maternal Morbidity	No	96	87.3
	Yes	14	12.7
Table 2b: Maternal Outcomes of Twin Pregnancy (N = 110)			

Maternal Outcome

The prevalence of hyperemesis gravidarum was observed in 31%. Further, the frequency of mild, moderate, and severe anemia among mothers of twins was 1.8%, 86%, and 1%, respectively. The frequency of preterm labor and PROM was as high as 34% and 26%, respectively, among mothers of twins delivered at the RIMS obstetrics and gynaecology ward. About 30% of the fetuses of twin pregnancy were found to have malpresentation (breech-vertex; breech-breech; breech-transverse), and polyhydramnios was observed in 7% of the pregnancy. 6% of the mothers developed postpartum hemorrhage requiring blood transfusion. It was observed that 13% (14) of mothers were with any of the morbidity conditions (diabetes or/and hepatitis B or/and hypothyroid or/and heart disease or/and psychiatric illness or/and uterine fibroid), out of which only 3 cases were with comorbidity. (Table 2b)

Adverse Perinatal Outcome

This study used preterm birth and low birthweight as the adverse perinatal outcome indicators. The frequency of preterm birth and low birthweight twins in the study is shown in Table 3, and the determining factors for preterm birth and low birthweight among twin pregnancies are shown in Tables 4 and 5, respectively.

	Parameters	Sample	Preterm Birth	Low Birth-Weight
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		(n)	(%)	p-value	(%)	p-value
	Total	110	25.5		45.5	
Type of Admission	Unbooked	38	34.2	0.126	44.7	0.913
	Booked	72	20.8		45.8	
Age Group	<30	71	25.4	0.973	47.9	0.489
	>=30	39	25.6		41.0	
Religion	Hindu	63	28.6	0.670	50.8	0.415
	Muslim	22	22.7		36.4	
	Others*	25	20.0		40.0	
Education status	Illiterate (0)	14	21.4	0.198	35.7	0.360
	Primary (1-8)	28	39.3		57.1	
	Secondary (9-12)	55	18.2		45.5	
	Higher (>12 std)	13	30.8		30.8	
Parity	Parity 0	45	37.8	0.045	60.0	0.008
	Parity 1	38	18.4		44.7	
	Parity >=2	27	14.8		22.2	
Hypertension	No	88	27.3	0.381	47.7	0.338
	Yes	22	18.2		36.4	
Type of Placenta	MCDA	57	24.6	0.252	42.1	0.112
	DCDA	39	20.5		41.0	
	MCMA	14	42.9		71.4	
	Parameters	Sample	Preterm Birth		Low Birth-Weight	
		(n)	(%)	P-Value	(%)	P-Value
Malpresentation	No	77	28.6	0.252	45.5	1.000
	Yes	33	18.2		45.5	
Mode of Delivery	Vaginal	57	33.3	0.049	49.1	0.423
	Cesarean	53	17.0		41.5	
History of Abortion	No	78	28.2	0.301	51.3	0.055
	Yes	32	18.8		31.3	
Hyperemesis Gravidarum	No	76	23.7	0.524	39.5	0.060
	Yes	34	29.4		58.8	
Anemic (Hb<10 mg/I)	No	14	21.4	0.711	28.6	0.174
	Yes	96	26.0		47.9	
Preterm Labor	No	73	12.3	0.000	37.0	0.012
	Yes	37	51.4		62.2	
PROM	No	81	22.2	0.193	46.9	0.608
	Yes	29	34.5		41.4	
Polyhydramnios	No	102	26.5	0.382	45.1	0.789
	Yes	8	12.5		50.0	
Postpartum Hemorrhage	No	103	26.2	0.483	48.5	0.013
	Yes	7	14.3		0.0	
Table 3: Prevalence of Preterm Birth (Birth before 37 Weeks of Gestation) and Low Birth Weight (<2.5 kg) of Both Twin Babies (N = 110)						

"Hypertension/Hpertensive disorder: systolic blood pressure ≥ 140 and diastolic blood pressure ≥ 90 "; PROM "Premature Rupture of Membrane"

The study observed the delivery of low-birthweight twins, more among mothers with polyhydramnios conditions during pregnancy (50%) as compared to their counterparts (45%).

In the case of postpartum hemorrhage, the frequency of low birthweight twins was 49% among those who had not experienced postpartum hemorrhage but there was no case of low birth weight among those with the condition (Table 3).

	Parameters	Odds Ratio	95% CI		P-Value
			Lower	Upper	
Type of Admission	Unbooked	Reference			
	Booked	0.27	0.06	1.17	0.080
Age Group	<30	Reference			
	>=30	1.32	0.27	6.43	0.733
Religion	Hindu	Reference			
	Muslim	0.32	0.05	2.13	0.237
	Others	0.54	0.11	2.63	0.447
Education Status	Illiterate (0)	Reference			
	Primary (1-8)	6.89	0.78	61.34	0.083
	Secondary (9-12)	0.96	0.13	7.27	0.969
	Higher (>12 std)	2.23	0.11	43.72	0.598
Parity	Parity 0	Reference			
	Parity 1	0.17	0.03	1.04	0.055
	Parity >=2	0.26	0.03	1.93	0.186
Hypertension	No	Reference			
	Yes	0.46	0.08,	2.62	0.379
Type of Placenta	MCDA	Reference			
	DCDA	0.76	0.18	3.17	0.704
	MCMA	3.31	0.45	24.49	0.241
	Parameters	Odds Ratio	95% CI		P-Value
Malpresentation			Lower	Upper	
	No	Reference			
	Yes	0.25	0.05	1.25	0.091
Mode of Delivery	Vaginal	Reference			
	Cesarean	1.34	0.34	5.25	0.671
History of Abortion	No	Reference			
	Yes	1.11	0.23	5.47	0.897
Hyperemesis Gravidarum	No	Reference			
	Yes	1.43	0.33	6.32	0.633
Anemic	No	Reference			
	Yes	0.93	0.12	7.02	0.942
Preterm Labor	No	Reference			
	Yes	11.29	2.87	44.45	0.001
PROM	No	Reference			
	Yes	2.42	0.67	8.79	0.178
Polyhydramnios	No	Reference			
	Yes	10.98	0.46	259.98	0.138
Postpartum Hemorrhage	No	Reference			
	Yes	0.19	0.01	4.15	0.293
	Constant	0.38	0.02	8.94	0.545

Table 4: Adjusted Odds of Preterm Birth (Birth before 37 Weeks of Gestation) among Twin Babies by Selected Background Characteristics (N = 110)

Parameters		Odds Ratio	95% CI		P-Value
			Lower	Upper	
Type of Admission	Unbooked	Reference			
	Booked	1.04	0.33	3.33	0.944
Age Group	<30	Reference			
	>=30	2.16	0.64	7.25	0.212
Religion	Hindu	Reference			
	Muslim	0.33	0.07	1.64	0.177
	Others	0.69	0.19	2.59	0.588
Education Status	Illiterate (0)	Reference			
	Primary (1-8)	4.41	0.74	26.39	0.104
	Secondary (9-12)	1.31	0.24	7.08	0.751
	Higher (>12 std)	0.09	0.01	1.02	0.052
Parity	Parity 0	Reference			
	Parity 1	0.21	0.06	0.79	0.020
	Parity >=2	0.06	0.01	0.35	0.001
Hypertension	No	Reference			
	Yes	1.08	0.31	3.76	0.910
Type of Placenta	MCDA	Reference			
	DCDA	1.18	0.40	3.51	0.768
	MCMA	6.71	1.17	38.46	0.033
	Parameters	Odds Ratio	95% CI		P-Value
Malpresentation			Lower	Upper	
	No	Reference			
	Yes	0.42	0.12	1.46	0.173
Mode of Delivery	Vaginal	Reference			
	Cesarean	1.57	0.52	4.69	0.423
History of Abortion	No	Reference			
	Yes	0.49	0.15	1.59	0.236
Hyperemesis Gravidarum	No	Reference			
	Yes	2.17	0.67	7.06	0.198
Anemic	No	Reference			
	Yes	1.96	0.35	11.10	0.445
Preterm Labor	No	Reference			
	Yes	4.23	1.32	13.54	0.015
PROM	No	Reference			
	Yes	0.46	0.14	1.48	0.190
Polyhydramnios	No	Reference			
	Yes	20.44	1.75	238.64	0.016
	Constant	0.52	0.04	7.73	0.637

Table 5: Adjusted Odds of Low Birthweight (<2.5 kg) among Twin Babies by Selected Background Characteristics (N = 110)

Factors Affecting Low Birth weight

Table 5 shows the logistic regression result of the likelihood of both twins having a low birthweight in twin pregnancy. After adjusting for factors, the result shows that compared to primiparous mothers, mothers with parity 1 and 2 or more were 79 and 94 percent less likely to give birth to both twins with low birthweight, respectively, and the difference was found to be statistically significant ($p = 0.020$ and 0.001). Compared to MCDA, fetuses with MCMA were 7 times more likely to give birth to low birthweight twins, and the difference was found to be statistically significant ($p = 0.033$). Similarly, compared to mothers without preterm labor, mothers with preterm labor were four times more likely to give birth to low birthweight twins. The difference was found statistically significant ($p = 0.015$). And mothers with the condition of polyhydramnios were 20 times more likely to give birth to both twins with low birthweight compared to their counterparts, and the difference was found to be statistically significant ($p = 0.016$). However, the adjusted effect of low birthweight of both twins shows that type of admission, age, religion, education, hypertension, presentation of fetuses, history of abortion, hyperemesis gravidarum, anemic condition, and PROM had no significant effect on low birthweight of both twins in the study.

DISCUSSION

The frequency of twin pregnancies in the study population is 10 per 1000 deliveries, which is very close to NFHS estimates.^[11] The result of 110 twin deliveries shows that the majority of the patients were primigravida, with an age less than 30 years with a secondary level of education, and belonged to the Hindu religion. The pregnancy outcome is also partly determined by the type of chorionicity and zygosity of the fetuses. Generally, the risk of perinatal morbidity and mortality was higher in monochorionic twins compared to dichorionic twins.^[12,13] Twins of opposite sex were almost always dizygotic. In rare instances, due to somatic mutations or chromosome aberrations, the karyotype or phenotype of a monozygotic twin gestation can be different.^[14]

The effect of adverse perinatal outcomes was documented in many studies. In low-income settings, half of the babies born at or below 32 weeks (2 months early) die due to a lack of feasible, cost-effective care, such as warmth, breastfeeding support, and basic care for infections and breathing difficulties.^[15] In high-income countries, almost all of these babies survived. Suboptimal use of technology in middle-income settings caused an increased burden of disability among preterm babies who survive the neonatal period.^[16] Preterm babies who survived suffer from various disabilities like cerebral palsy, sensory deficits, learning disabilities, and respiratory illnesses. The morbidity associated with preterm birth often extends to later life, resulting in physical, psychological, and economic stress to the individual and the family. In some settings, especially in South Asia, a high proportion of low-birthweight babies were term babies who were small for gestational age.^[17] Babies who were both preterm and small for gestational age posed a higher risk than babies with only one of the above conditions.^[18] An undernourished mother gave birth to low-birthweight babies, and prenatal undernutrition leads to a slowdown in perinatal weight gain, which even continues in the later life of the affected individual.^[19] A study has shown a strong association between low birthweight and type 2 diabetes.^[20]

In terms of booking status, the majority of the pregnancies were booked, buttressing the importance of specialist care for a better feto-maternal outcome.^[21] The findings showed the majority of twin gestations delivered by cesarean section, which was in concordance with the findings of Kuti O. et al.,^[16] depicting a high-risk situation of pregnancies leading to cesarean delivery. Similar to the findings of Salim R et al. [22], the present study found a

significant difference in the birthweights of first and second twins; however this finding contradicts the findings of Kuti O et al.,^[23] and Akaba GO et al.^[24]

Nonetheless, lack of studies in the context of Manipur pertaining to twin pregnancy, studies elsewhere show risk of miscarriage, preeclampsia, polyhydramnios, preterm labor, abnormal vascular communication, fetal malformation, discordant fetal growth, cord complications, stillbirth, increased rate of cesarean section, abnormal iron and folic acid deficiency anemia, postpartum hemorrhage and maternal death were higher in multifetal pregnancy compared to singleton pregnancy.

Mixed findings regarding mode of delivery and its association with fetal outcome were observed. The presentation of twins significantly affects mode of delivery, which aligns with the findings of this study, as a higher proportion of twins with malpresentation had cesarean delivery and a higher proportion of twins without malpresentation had vaginal delivery.^[25,26,27] The risk of perinatal morbidity and mortality was higher in monochorionic twins compared to dichorionic twins, and this study found only 35% of twins with dichorionic twins. In concordance with the study by Turpin et al., this study also found a higher proportion of twins with the same sex.

The perinatal mortality marked by viability of the twin shows that the perinatal mortality rate of 72/1000 total births was lower than 102 and 186 per 1000 births reported by Akaba GO et al.,^[25] and Aisien AO et al., respectively^[21] but higher than 56 per 1000 births reported by Bassey G. and Inimgba NM.^[1] Growth discordance in monochorionic twins was higher as compared to dichorionic twins. It may be due to the degree of restricted growth, which is more common in monozygotic twins than dizygotic twins, leading to only 12% of twins delivered with a birthweight greater than 2.5 kg in both twins.^[5] Similarly, other studies found a higher risk of the 2nd twin than the 1st twin in terms of unfavorable outcomes, including death because of intrapartum complications^[25] 8% of deliveries result in 2nd twin with APGAR < 7% compared to 1st twin (2%); 15% of deliveries require resuscitation in 2nd twin compared to 1st twin. Similarly, 10% of deliveries admitted to the NICU in the 2nd twin compared to 6% in the 1st twin. 3% of deliveries resulted in early neonatal death of the 2nd twin without a case in the 1st twin.

According to the NFHS (National Family Health Survey), also known as the DHS (Demographic Health Survey), [26] there was a huge decline in neonatal mortality among children below 5 years in Manipur from 25% in NFHS 1 (1992-93) to 16% in NFHS 4 (2015-16). While observing the antenatal care during pregnancy, in NFHS 4, 89% of mothers received ANC from skilled providers; 87% were from doctors. The percentage of mothers with at least 4 ANC visits was only 69%, though the percentage of ANC visits in the first trimester is 77%. The percentage of mothers who received information on pregnancy complications ranges from 12% (convulsion) to 24% (high blood pressure). Mothers receiving information on where to go if they experienced a pregnancy complication is a little higher (41%). In Manipur, 64% of mothers had undergone ultrasound examinations during their pregnancy, and this increases with an increase in the number of ANC visits.

In alignment with these findings, the percentage of mothers with hypertensive disorder, PROM, malpresentation, hyperemesis gravidarum, and preterm labor ranges between 20% and 34%, but less than 10% of mothers have antepartum and postpartum hemorrhage or polyhydramnios. Though the consumption rate of IFA among women in NFHS 4 was high, the number of anemic women in this study was observed to be high. Half the babies were born too early or below 32 weeks gestation due to a lack of basic care and, if survived, suffered from various disabilities, including physical and neuropsychological, which is an economic stress to the individual and their families. In this context, this study was very important and crucial to find out the determining factors for both preterm birth and low birthweight twins. The findings of this study show that the difference in the unadjusted observation of preterm birth was not

significant, whereas after adjusting for other factors, booked admission had significantly lower odds of preterm delivery. In the case of parity, the difference was found significant with or without adjusting for factors. Even the earlier studies observed a higher risk of preterm birth risk factors among primiparous mothers.^[28] The difference in frequencies of preterm births was significantly lower in the case of cesarean delivery compared to vaginal delivery; however, adjusted effects show no significant difference.

Regardless of adjusted or unadjusted, preterm labor was observed to have a significant effect on preterm birth on twins in the study. Many studies have shown increased practice of induction of labor and cesarean delivery, which may increase multifetal births or patient-practitioner concern. However, it was difficult to accurately diagnose preterm labor because of the similarity of signs and symptoms with healthy women who do not deliver preterm.

Studies had shown twin pregnancies were more likely to have low birthweight babies and maternal systemic diseases such as hypertension, diabetes, and periodontal disease. Abnormal placental function influences growth, especially during the last trimester of pregnancy, and if deficient, results in poor growth of fetuses. Education and parity were observed to have a detrimental effect on the birthweight of the twin in compared with other studies.^[29] In contrast with findings of Bassey G and Inimgba NM, type of placenta had a significant effect on birthweight of twins. In contrast with findings of Bassey G and Inimgba NM,^[1] type of placenta had significant effect on birthweight of twins. Interestingly, in this study, preterm labor was found to have a significant effect on low birthweight with and without adjustment, which many studies did not include, which may be because preterm labor did not directly influence the size of the baby.

CONCLUSION

The most common maternal complications of twin pregnancy are hyperemesis gravidarum, preterm labor, hypertensive disorder, and PROM. While observing the adverse outcomes, the risk factors that had a significant effect on preterm birth and low birth weight were booking status, literacy, parity, type of placenta, presentation of fetuses, preterm labor, and the presence of polyhydramnios.

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