

The Clinical Study of Twin Pregnancy and its Effect on Maternal and Fetal Outcome

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Received: 25-05-2022 / Revised: 25-06-2022 / Accepted: 20-07-2022

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Conflict of interest: Nil

Abstract

Background: There has been an unprecedented rise in multiple pregnancy in the last two decades. An increment of 50% was observed in number of live births from twin deliveries. Naturally 1 out of 80 pregnancies are twin pregnancies, corresponding to 2.6% of all newborns, the frequency of monozygotic twin births is rather constant worldwide- approximately one set per 250 births, and by large, is independent of race, heredity, age, and parity.

Materials & Methods: The present prospective study was conducted from 1/1/2019 to 31/12/2019 for a period of one year on 71 pregnant women with twin pregnancy. All the pregnant women with multifetal gestation admitted to Hospital for delivery in the year 2019 were included and Pregnant women who do not provide written consent were excluded from this study.

Aims: To study the maternal and fetal outcomes in twin pregnancy

Results: Incidence of multifetal gestations is 5.91 per 1000 deliveries, More than half (54.9 %) of them belonged to age group of 21 to 25 years, Most of the study participants (30 out of 71 i.e., 42.3%) were primigravida, Out of 71 pregnant mothers, 44 i.e., 61.9% were of Dichorionic Di-Amniotic type, most common maternal complications in case of multifetal gestations and their frequencies among the study participants is Three fourth of the mothers i.e., 74.6% ended up with pre-term labour, Next most common complications were PPROM (22 out of 71 i.e., 31%), Pre-eclampsia (18 out of 71 i.e., 25.4%) and Anaemia (16 out of 71 i.e., 22.5%), Other uncommon complications in the mothers pregnant with multifetal gestation were Polyhydramnios (8.5%), Gestational Hypertension (2.8%) and Gestational Diabetes Mellitus (2.8%). 4 pregnant mothers 71 (5.6%) had history of previous LSCS. 2 out of 71 multifetal gestations i.e., 2.8% ended up in miscarriage. No cases of Antepartum haemorrhage were identified. Most common complication in NICU admitted new-borns was Respiratory distress. In total, 81 new-borns (62.3 %) had respiratory distress, however only 6 of them (4.6 % of the total 130 live-born) were intubated. Two other severe complications observed were intra-ventricular haemorrhage (in 21 babies i.e., 16.2 %) and sepsis (in 9 babies i.e., 6.9 %).

Conclusion: Most common maternal complications in case of multifetal gestations i.e., 74.6% ended up with pre-term labour, Next most common complications were PPROM (22 out of 71 i.e., 31%), Pre-eclampsia (18 out of 71 i.e., 25.4%) and Anaemia (16 out of 71 i.e., 22.5%), Most common complication in NICU admitted new-borns was Respiratory distress. In total, 81 new-borns (62.3 %) had respiratory distress, however only 6 of them (4.6 % of the total 130

live-born) were intubated. Two other severe complications observed were intra-ventricular haemorrhage (in 21 babies i.e., 16.2 %) and sepsis (in 9 babies i.e., 6.9 %), emphasizing the need of close antenatal surveillance and need to deliver with good NICU care.

Keywords: Twin pregnancy, Preterm labour, Respiratory distress, Anemia, Gestational diabetes.

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Introduction

There has been an unprecedented rise in multiple pregnancy in the last two decades. An increment of 50% was observed in number of live births from twin deliveries [1]. Naturally 1 out of 80 pregnancies are twin pregnancies, corresponding to 2.6% of all new-borns [4]. the frequency of monozygotic twin births is rather constant worldwide- approximately one set per 250 births, and by large, is independent of race, heredity, age, and parity [2]. In general, the degree of maternal physiological change is greater with multiple foetus than with a single foetus. Beginning in the first trimester, and temporarily associated with higher serum beta-HCG levels, women with multifetal gestation often have nausea and vomiting in excess of women with a singleton pregnancy. Normal maternal blood volume expansion is increased in singleton pregnancy by 40 to 50 percent, and it is 50 to 60 percent with twins—an additional 500 mL increase is present [3]. The red cell mass increases as well, but proportionately less in twin pregnancies than in singletons. Both the remarkable increase in maternal blood volume and the increased iron and folate requirements predispose to a greater prevalence of maternal anaemia. Average blood loss with vaginal delivery of twins is 1000 mL, or twice of the singleton pregnancy delivery. Whenever there is imbalance in the adaptation, various complications occur [4]. One of them is Pre-eclampsia. The incidence of pre-eclampsia in twin pregnancies is higher than in singletons. The rate of preterm birth among multifetal

gestations has increased over the past two decades [5]. Twins have higher rates of perinatal mortality than singletons at term, but lower gestational age specific mortality before term [6]. The present study has been undertaken to know the obstetric and perinatal outcome of pregnant women with twin pregnancy.

Materials & methods

Prospective study done for period of 12 months from 1/1/2019 to 31/12/2019. All the pregnant women pregnant with Twin gestation admitted to Hospital for delivery formed the study population. They were screened for eligibility criteria and then followed up throughout the intranatal and postnatal period. Sample size: Total number of pregnant women with Twin pregnancy are 71.

Inclusion Criteria • All the pregnant women with multifetal gestation admitted to Hospital for delivery in the year 2019.

Exclusion Criteria • Pregnant women who do not provide written consent.

Method of Study Subjects: Data was collected after obtaining written informed consent. The data regarding name, age, in patient number, parity, gravida, residence, socioeconomic status, chief complaints, menstrual history, duration of married life, period of infertility, family history, the mode of conception – spontaneous, ovulation induction or IVF were noted in the proforma [7]. The complications associated with first, second and third trimesters like: Hyperemesis, Pre-

eclampsia, Gestational diabetes mellitus, Anaemia, Polyhydramnios, Preterm labour, PPRM, and IUGR were recorded. Twin specific complications such as: Twin-Twin Transfusion Syndrome, TRAP, Acardiac twins, discordant twins, Single foetal demise and congenital anomalies were studied. The intrapartum complications like PPH, malpresentations, cord prolapse, low lying placenta and placental abruption were also studied. Chorionicity was detected by ultrasound examination in antenatal period and confirmed by clinical and anatomical examination following delivery then classified into 4 categories: Dichorionic diamniotic, Monochorionic diamniotic, Monochorionic monoamniotic, Monochorionic monoamniotic conjoined twins, based on the examination findings. The outcome is measured in terms of gestational age at delivery (>37wks, 34-37wks,<34wks), mode of delivery (Caesarean section/ vaginal delivery/vaginal delivery followed by caesarean delivery), presentations at birth, interval between delivery of first and second twin, Apgar scores at 0 and 5 minutes of both the twins, birth weight (>2500gms, 2500- 1500gms,<1500gms) of both the twins, dead\ still\ live, admission to Neonatal Intensive Care Unit (NICU) of both the twins and neonatal complications

of both the twins in terms of death in NICU [8].

Newborns weighing less than 2.5 kg were classified as low birth weight and those weighing less than 1.5 kg as very low birth weight. A 5-minute Apgar score less than 7 is defined as a criterion of immediate neonatal morbidity. Congenital malformations were diagnosed by ultrasound examination during the antenatal period or by clinical examination of the neonate [9].

Statistical analysis: Data entry was done in Microsoft excel version 2017 and analysis was done in the same software. Categorical data were compiled and represented in frequencies, proportions and percentages. Numerical data were averaged and represented as mean along with standard deviation. Also, numerical data were grouped into various categories and represented as percentages.

Results

In our study, Incidence of multifetal gestations is 5.91 per 1000 deliveries, More than half (54.9 %) of them belonged to age group of 21 to 25 years, Most of the study participants (30 out of 71 i.e., 42.3%) were primigravida, Out of 71 pregnant mothers, 44 i.e., 61.9% were of Di-Chorionic Di-Amniotic type

Table 1: Distribution of study participants as per period of gestation at the time of delivery

Categories of period of gestation	Frequency	Percentage (%)
≤ 32 weeks	16	22.5
33 – 34 weeks	13	18.3
35 – 36 weeks	24	33.8
≥ 37 weeks	18	25.4
Total	71	100.0

A quarter of the study participants (18 out of 71 i.e., 25.4%) were at term when they delivered. 33.8% of the study participants delivered when their POG was 35-36 weeks and 18.3% of them

delivered when their POG was 33-34 weeks. Out of 71 participants, 16 of them (22.5%) delivered when their POG was 32 weeks or less.

Table 2: Maternal complications among study participants

Maternal complications	Frequency	Percentage (%)
Pre-term labour	53	74.6
PPROM	22	31.0
Pre-eclampsia	18	25.4
Gestational Hypertension	2	2.8
Anaemia	16	22.5
Polyhydramnios	6	8.5
Previous LSCS	4	5.6
Gestational Diabetes Mellitus	2	2.8
Miscarriage	2	2.8
Antepartum Haemorrhage	0	0.0

Total frequencies do not add up to 71 as the complications are not mutually exclusive. Three fourth of the mothers i.e., 74.6% ended up with pre-term labour. Next most common complications were PPRM (22 out of 71 i.e., 31%), Pre-eclampsia (18 out of 71 i.e., 25.4%) and Anaemia (16 out of 71 i.e., 22.5%). Other uncommon complications in the mothers pregnant with

multifetal gestation were Polyhydramnios (8.5%), Gestational Hypertension (2.8%) and Gestational Diabetes Mellitus (2.8%). 4 pregnant mothers 71 (5.6%) had history of previous LSCS. 2 out of 71 multifetal gestations i.e., 2.8% ended up in miscarriage. No cases of Antepartum haemorrhage were identified.

Table 3: Mode of delivery among study participants

Mode of delivery	Frequency	Percentage (%)
Vaginal delivery	52	73.2
Emergency LSCS	19	26.8
Elective LSCS	0	0.0
Combined LSCS + Vaginal delivery	0	0.0
Total	71	100.0

Various complications dictate the decision on mode of delivery of all pregnancies. More so is the situation for multifetal gestations, because of increased complications. Out of the 71 pregnancies, 52 i.e., 73.2% delivered vaginally while the remaining 19 pregnancies i.e., 26.8% required emergency LSCS to be conducted.

Table 4: Complications that required additional attention during delivery

Complications	Frequency	Percentage (%)
Malpresentation	24	33.8
PPH	6	8.5
Low Lying Placenta	1	1.4
Cord Prolapse	0	0.0
Placental Abruption	0	0.0

The most common complication was malpresentation, which was found in 24 gestations i.e., in 33.8% gestations. Next common complication among the study participants was PPH (Post-partum haemorrhage) which was found in 6 out of

71 multifetal gestations i.e., in 8.5%. Only 1 out of 71 pregnancies were complicated with a low lying placenta. There were no cases of cord prolapse or placental abruption.

Table 5: Interval between births of fetuses in multifetal gestations

Birth interval (minutes)	Frequency	Percentage (%)
< 5	33	46.4
6 – 15	30	42.3
> 15	8	11.3
Total	71	100.0

In most of the cases (33 out of 71 i.e., 46.4%), 2nd twins were delivered within 5 minutes of delivery of 1st twin. Another 30 of them (42.3%) were delivered with a birth interval of 6 to 15 minutes. Remaining 8 deliveries (11.3%) required more than 15

minutes of interval for birth of 2nd twin. Also, the range of birth interval was 1 minute to 140 minutes. Mean (standard deviation) birth interval was 10.46 minutes (17.17 minutes).

Table 6: Distribution of new-borns as per their birth weight

Birth weight categories	Twin 1 n (%)	Twin 2 n (%)	All babies n (%)
< 1.5 kg (VLBW)	15 (21.1%)	19 (26.8%)	34 + 1 = 35 (24.5%)
1.5 – 2.49 kg (LBW)	48 (67.6%)	46 (64.7%)	94 (65.7%)
≥ 2.5 kg (Normal)	8 (11.3%)	6 (8.5%)	14 (9.8%)
Total	71 (100.0%)	71 (100.0%)	142 + 1 = 143 (100.0%)
Mean birth weight (kg)	1.81	1.81	1.81
Standard deviation (kg)	0.50	0.55	0.50

Out of the total 143 new-borns, only 14 of them i.e., 9.8% belonged to category of normal birth weight i.e., more than or equal to 2.5 kg. 94 of the new-borns i.e., 65.7% belonged to category of low birth weight (1.5 kg to 2.49 kg). Remaining 35 of them i.e., 24.5% belonged to category of very low birth weight (< 1.5 kg). Besides, as

clearly seen in the table, there is no much difference in the proportion of new-borns in birth weight categories among the 1st born and the 2nd born. Also, overall mean (standard deviation) birth weight is 1.81 kgs (500 grams). Individual mean of birth weights of 1st and 2nd twins is also 1.81 kg.

Table 7: APGAR scoring of new-borns delivered from multifetal gestations

APGAR scoring of 1 st twin	Twin 1 at 1 minute	Twin 1 at 5 minutes
0 – 3	6 (9.1%)	2 (3.0%)
4 – 6	34 (51.5%)	7 (10.6%)
7 - 10	26 (39.4%)	57 (86.4%)
Total new-borns (1st twins)	66 (100.0%)	66 (100.0%)
APGAR scoring of 2 nd twin	Twin 2 at 1 minute	Twin 2 at 5 minutes
0 – 3	5 (7.9%)	2 (3.2%)
4 – 6	27 (42.9%)	5 (7.9%)
7 - 10	31 (49.2%)	56 (88.9%)
Total new-borns (2nd twins)	63 (100.0%)	63 (100.0%)

Among the 66 1st born, almost half of them had APGAR score ranging from 4 to 6 at the end of 1 minute. Only 40% of them had a safe range of APGAR score. This proportion increased to 86.4% at the end of 5 minutes. Only 2 out of the 66 babies i.e., 3% had very low APGAR score at the end of 5 minutes. There were only 63 2nd twins

who were born alive. 31 of them i.e., 49.2% had APGAR score of 7 to 10 at the end of 1 minute and this proportion increased to 88.9% at the end of 5 minutes. There were only 2 of the 2nd twins i.e., 3.2% that had the lowest range of APGAR score even at the end of 5 minutes.

Table 8: Foetal complications among foetuses which were delivered out of multifetal gestations

Fetal complications	Frequency	Percentage (%)
Twin to twin transfusion syndrome	1	1.4
Discordant twins	1	1.4
Acardiac twins	1	1.4
Intrauterine fetal demise	6	8.4
Congenital anomalies	1	1.4

Out of 71 multifetal gestations 8.4% of pregnancies i.e., 6 mothers faced intrauterine foetal demise, 2.8% of pregnancies (i.e., 2 mothers) faced miscarriages. Other complications were

twin to twin transfusion syndrome, discordant twins and acardiac twins, which were seen in 1 pregnancy each i.e., 1.4% each. There was another pregnancy (1.4%) with a congenital anomaly.

Table 9: Complications in new-borns delivered to multifetal gestations (in terms of babies)*

Complication		Frequency	Percentage (%)
NICU admission	Required	111	85.4
	Not required	19	14.6
	Total live born	130	100.0
Respiratory distress	Present	81	62.3
	Absent	49	37.7
	Total live born	130	100.0
IVH	Present	21	16.2
	Absent	109	83.8
	Total live born	130	100.0
Sepsis	Only one twin	9	6.9
	None	121	93.1
	Total live born	130	100.0
Intubation	Required	6	4.6
	Not required	124	95.4
	Total live born	130	100.0
Death	Still born	9	6.5
	Early neonatal death	21	15.1
	Total perinatal deaths	30	21.6
	No death	109	78.4
	Total	139[#]	100.0

*13 still born babies are kept as a separate entity while calculating each of the

proportions pertaining to calculation. #Denominator is considered as 139 as 4

foetuses faced miscarriage. There are a total of 143 new-borns out of which 13 are still born amounting to 9.1%. NICU admission was required for 111 new-borns among 130 live born i.e., 85.4 %. Only 19 out of 130 alive new-borns (14.6 %) did not require ICU admission. Most common complication in NICU admitted new-borns was Respiratory distress. In total, 81 new-borns (62.3 %) had respiratory distress, however only 6 of them (4.6 % of the total 130 live-born) were intubated. Two other severe complications observed were intra-ventricular haemorrhage (in 21 babies i.e., 16.2 %) and sepsis (in 9 babies i.e., 6.9 %). Death: Out of the 130 live new-borns, 21 died due to various complications within 7 days of birth in the NICU. Considering this and the 9 still born babies, a total of 30 lives were lost in the perinatal period. Thus, in the present study, Peri-Natal Mortality Rate (PNMR) was 21.6 %.

Discussion

In a retrospective record-based analysis of pregnancy outcome of twin pregnancy in a Thailand Hospital, incidence of twin pregnancies was 8.6 per 1000 births. Common maternal complications of twin gestation as per the study were preterm delivery (49.2 %), anaemia (21.5 %), PIH (13.4 %), PROM (10.0 %) and PPH (5.6 %). Caesarian section rate was 58.3 %. Most common neonatal complication was low birth weight (62.3%). Perinatal mortality rate was 45 per 1,000 births. Prematurity was the most common cause of neonatal death. No neonatal death was found after 34 weeks of gestation [10].

A study of maternal and foetal outcome in twin gestation at Tertiary care teaching hospital in Maharashtra concluded that multifetal gestations and their complications are on the rise. Incidence of twins was 1.49 %. Caesarian section rate was 33 %. Extreme prematurity (37%) and very low birth weight (33%) predisposed majority of perinatal death [11].

In a prospective, observational, hospital based study in a tertiary care hospital in Sudan on outcomes of twin gestation revealed the incidence of twins to be 3.34%. Commonest antenatal complications encountered were severe UTI (70.5 %), Hyperemesis gravidarum (46.4 %) and anaemia (38.4 %); most important postpartum complication was PPH (34.8 %). Majority of the babies needed NICU admission. Early NMR was 196 per 1000 study subjects [12].

In a five-year retrospective survey conducted in Kerala in 2017 on maternal determinants and foetal outcome of twin pregnancy, Most common complication here too was preterm delivery (64.2 %). Caesarian section rate was 78 %. Among 218 foetuses delivered, 214 were live births and 4 still born. There were low birth weight Babies (70.6%), normal weight (15.3%), VLBW babies (11.5%) and 2.7% ELBW babies. Foetal complications were IUGR (11.46%), discordant twins (6.8%), congenital anomalies (1.8%), single foetal demise (1.8%) and Intra uterine death of a twin (0.4%). Perinatal mortality rate was 1.65 per thousand births. Dichorionicity led to less foetal complications and low perinatal mortality [13-14].

In our study Most common maternal complications in case of multifetal gestations i.e., 74.6% ended up with pre-term labour, Next most common complications were PPRM (22 out of 71 i.e., 31%), Pre-eclampsia (18 out of 71 i.e., 25.4%) and Anaemia (16 out of 71 i.e., 22.5%), Most common complication in NICU admitted new-borns was Respiratory distress. In total, 81 new-borns (62.3 %) had respiratory distress, however only 6 of them (4.6 % of the total 130 live-born) were intubated. Two other severe complications observed were intra-ventricular haemorrhage (in 21 babies i.e., 16.2 %) and sepsis (in 9 babies i.e., 6.9 %). our results are comparable with above studies except

sudan study were most common complication were UTI. [14]

Conclusion

Most common maternal complications in case of TWIN gestation i.e., 74.6% ended up with pre-term labour, Next most common complications were PPRM (22 out of 71 i.e., 31%), Pre-eclampsia (18 out of 71 i.e., 25.4%) and Anaemia (16 out of 71 i.e., 22.5%), Most common complication in NICU admitted new-borns was Respiratory distress. In total, 81 new-borns (62.3 %) had respiratory distress, however only 6 of them (4.6 % of the total 130 live-born) were intubated. Two other severe complications observed were intra-ventricular haemorrhage (in 21 babies i.e., 16.2 %) and sepsis (in 9 babies i.e., 6.9 %, Emphasizing for early diagnosis of twin gestation with its chorionicity, careful monitoring for foetal wellbeing throughout the pregnancy, regular antenatal checkups, adequate rest, good diet, maternal glucocorticoids therapy in preterm labour, short term tocolysis and institutional delivery having level III neonatal back up facilities can improve the maternal and perinatal outcome in twin gestation.

Author Contribution: The first author Dr. Vijayalaxmi Davalagi was involved in Data collection, design of the article while the second & corresponding author Dr. Venkataravikumar Chepuri was involved in the technical aspect (Data analysis, interpretation, plagiarism check, English language and grammar check etc.) revision and drafting of the manuscript, final approval of version for publication.

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