

CLINICAL STUDY OF TWIN PREGNANCY IN RELATION TO MATERNAL AND FETAL MORBIDITY AND MORTALITY IN SEMI-URBAN POPULATION

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Abstract

Background: While carrying twin pregnancy can be exciting for the family, the risk of illnesses increase manifold when compared to singleton pregnancies. This study was conducted to know about the factors that can be associated with the determination of mortality and morbidity revolving around the twin gestation.

Keywords:

Twin Pregnancy, Maternal Morbidity, Neonatal Morbidity

Objectives: To compare the perinatal outcome in twins with respect to few factors and identification of association of those factors which significantly affect the mortality and morbidity.

Methods: The comparative, mixed observational. prospective study on 100 women with twin gestation was conducted at Dr. D.Y. Patil Medical College and Hospital, Pune from period of 1st September 2019 to 30th July, 2021. Results were assessed for significance using Chi Square Test.

Results: This study showed perinatal mortality of 1.72% in booked cases compared to 23.81% in unbooked cases. Monochorionic and dichorionic twins showed perinatal mortality of around 19.23% and 8.10% respectively. Babies born before 28 weeks of gestation gave a perinatal mortality of 87.5% and 75% when born between 28 – 32 weeks of gestation. Neonatal morbidity was assessed by NICU admissions of 38% of all the twins born. The least number of NICU admissions was among gestational age of 28 – 32 weeks (25%) and birth weight >1.5 kg (32.4%). PPH as maternal morbidity was seen to increase with the increasing birth weights of each twin, with overall no maternal mortality in the whole study.

Conclusion: The perinatal outcome can be improved in twin pregnancies by identifying the chorionicity and close follow up of the whole pregnancy.

Introduction

Twin pregnancy is a mixed blessing, an exciting prospect of an instant family and also worrying aspect for more problems till delivery. With the advent of assisted reproductive techniques, the rare and sporadic twinning has been converted to inevitable multiple pregnancies, with increased risks and associated complications. The pregnant women require precise diagnostic tools, fetal medicine intervention, additional care due to increased physiological demands and intensive neonatal support. They are at higher risks of problems like hyperemesis, antepartum and postpartum haemorrhage, anaemia, PIH, premature rupture of membranes etc. Approximately 70% twin pregnancies deliver at 34-36 weeks, 20% at 38 weeks and 10% at full term. Labor is often difficult and prolonged with increased risk of peripartum hypoxia and also fetal demise. Neonatal period is more difficult with higher incidences of respiratory distress, sepsis and prematurity. Therefore, it is very important to detect early twin gestation and high risk factors to improve the perinatal outcome of a mother with two healthy babies.

Aims and Objectives

To compare perinatal outcome in twin gestation with respect to antenatal care, chorionicity, gestational age, birth weight and NICU admissions which significantly affect maternal and fetal morbidity and mortality.

Material and Methods

The study was conducted at Dr. D.Y. Patil Medical College and Hospital, Pimpri, Pune from period of 1st September 2017 to 30th July, 2021. The patients were taken up from antenatal OPD, antenatal ward and labor room for the study. This was a comparative, retrospective and descriptive study, on a group of 100 women.

Defining the study group: Both booked and unbooked cases were included. Booked cases were those having at least 3 antenatal visits (with the first visit in the first or early second trimester and

one each in the second and third trimester) with basic investigations and at least one ultrasonographic study. Unbooked cases were patients referred for the first time in labor.

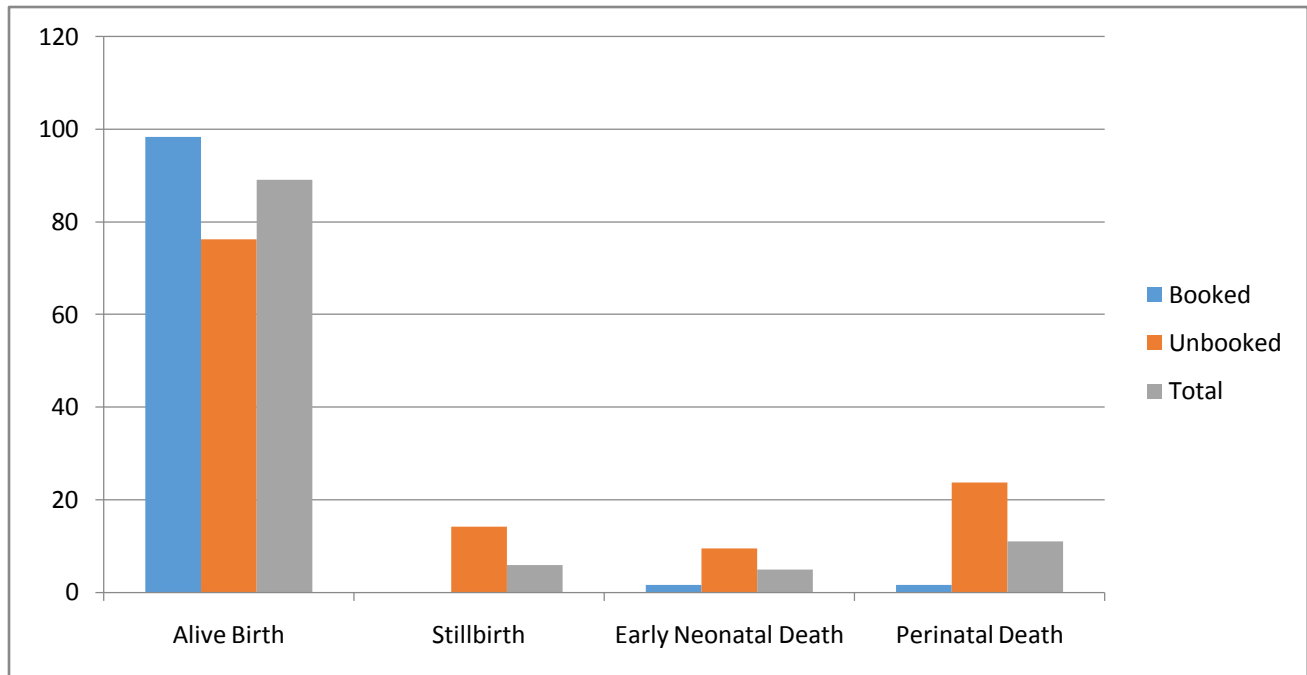
Data Collection Procedure: Patients detailed history including medical and surgical disorders, if any, was noted. Clinical examination was done and the relevant data was recorded on the preformed proforma. Patient detail was recorded in serial manner and the same serial code was given to the babies with a suffix of Tw1 (for Twin 1) and Tw2 (for Twin 2) for following up the outcome. The patients were followed up subsequently till delivered. The live-born babies were followed up to look for any complication, i.e. those occurring within 7 days of birth and babies requiring NICU admission. The data was recorded and tabulated and analyzed. Comparisons were done within the sample size, the total perinatal morbidity and mortality was calculated within each of the comparison groups. To assess the significance of the difference, in various values between the groups, chi square test was used. The observations and results were then compiled and tabulated.

Results:

Following results were obtained from various data that was received:

Table 1: Distribution of Perinatal Mortality with respect to Antenatal Follow up

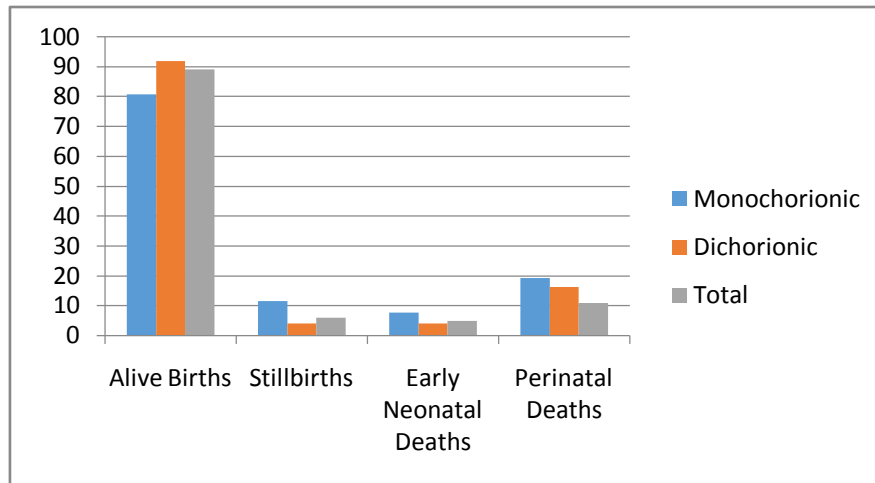
Antenatal Follow-up	No. Of births	Stillbirth (%)	Early Neonatal deaths (%)	Perinatal deaths (%)	Alive Births (%)
Booked	116	0(0)	2(1.72)	2(1.72)	114(98.28)
Unbooked	84	12(14.29)	8(9.52)	20(23.81)	64(76.19)
Total	200	12(6)	10(5)	22(11)	178(89)



Among 116 twins born to booked patients, there was no stillbirth and perinatal mortality was 1.72%. In unbooked or referred patients, the Perinatal mortality was 23.81% (12 stillbirths and 8 early neonatal deaths).

Table 2 : Distribution of Perinatal Mortality with respect to Chorionicity

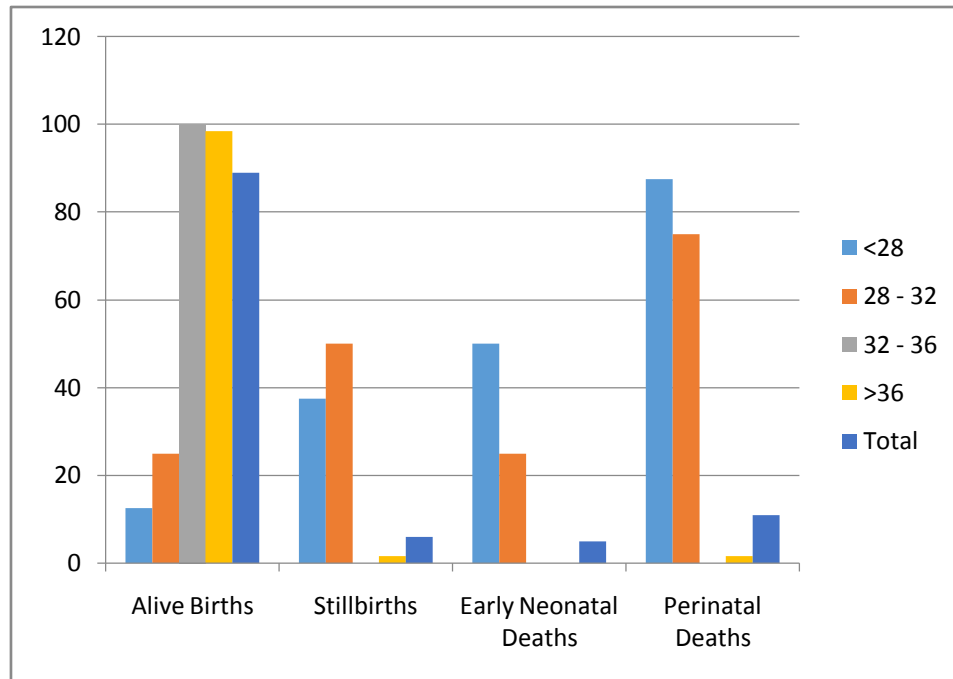
Placentation	No. Of births	Stillbirth (%)	Early Neonatal deaths (%)	Perinatal deaths (%)	Alive Births (%)
Dichorionic	148	6(4.05)	6(4.05)	12(16.20)	136(91.9)
Monochorionic	52	6(11.54)	6(7.69)	10(19.23)	42(80.77)
Total	200	12(6)	10(5)	22(11)	178(89)



Among 26 monochorionic gestations, i.e. 52 twin babies, there was 3 stillbirths and 2 early neonatal deaths, therefore perinatal mortality was 19.23%. Among 148 dichorionic twins, the Perinatal mortality was 8.10% (6 stillbirths and 6 early neonatal deaths).

Table 3 : Distribution of Perinatal Mortality with respect to Gestational Age at the time of delivery

Gestational Age (Weeks)	No. Of births	Stillbirth (%)	Early Neonatal deaths (%)	Perinatal deaths (%)	Alive Birth (%)
<28	16	6(37.5)	8(50)	14(87.5)	2(12.5)
28-32	8	4(50)	2(25)	6(75)	2(25)
32-36	48	0(0)	0(0)	0(0)	48(100)
> 36	128	2(1.56)	0(0)	2(1.56)	126(98.44)
Total	200	12(6)	10(5)	22(11)	178(89)

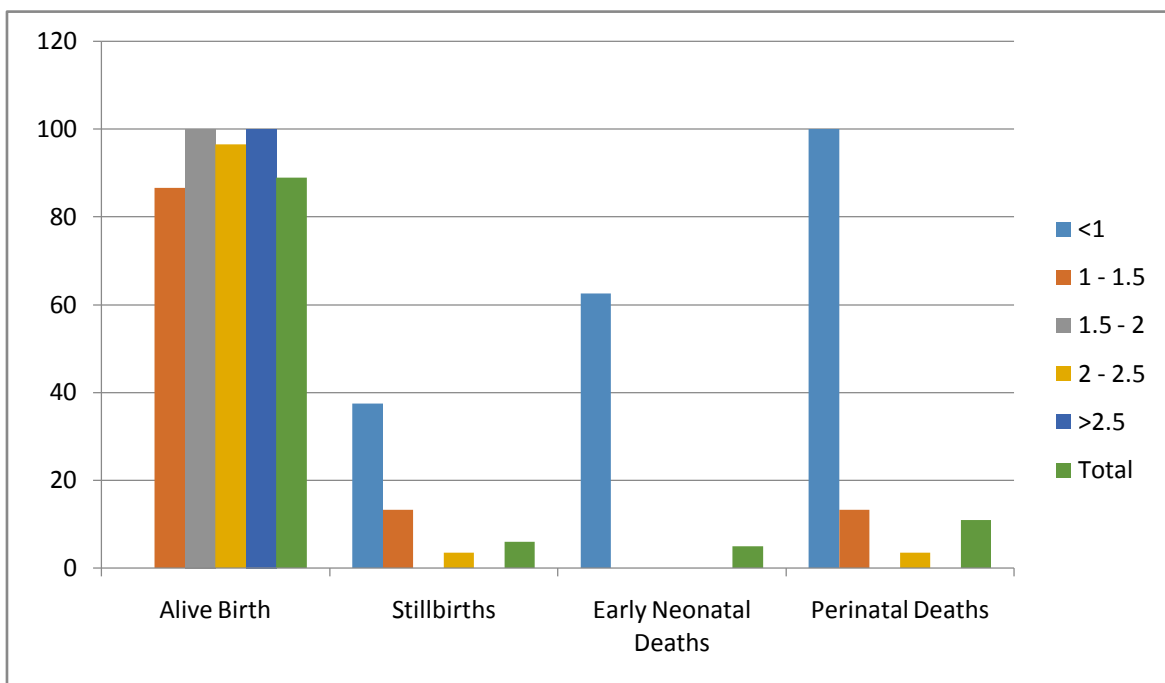


Out of 16 babies born before 28 weeks of gestation, there were 6 stillbirths and 4 early neonatal deaths, giving perinatal mortality of 87.5%. Between 28-32 weeks, there were 4 stillbirths and 2 early neonatal deaths, hence perinatal mortality of 75%. However, no mortality was recorded between 32-36 weeks of gestation. More than 36 weeks of gestation, there was 2 stillbirth and no neonatal deaths, thus mortality of about 1.56%.

Table 4 : Distribution of Perinatal Mortality with respect to Birth Weight

Birth Weight (kg)	No. Of births	Stillbirth (%)	Early Neonatal deaths (%)	Perinatal deaths (%)	Alive Births (%)
< 1	16	6(37.5)	10(62.5)	16(100)	0(0)
1-1.5	30	4(13.33)	0(0)	4 (13.33)	26(86.67)

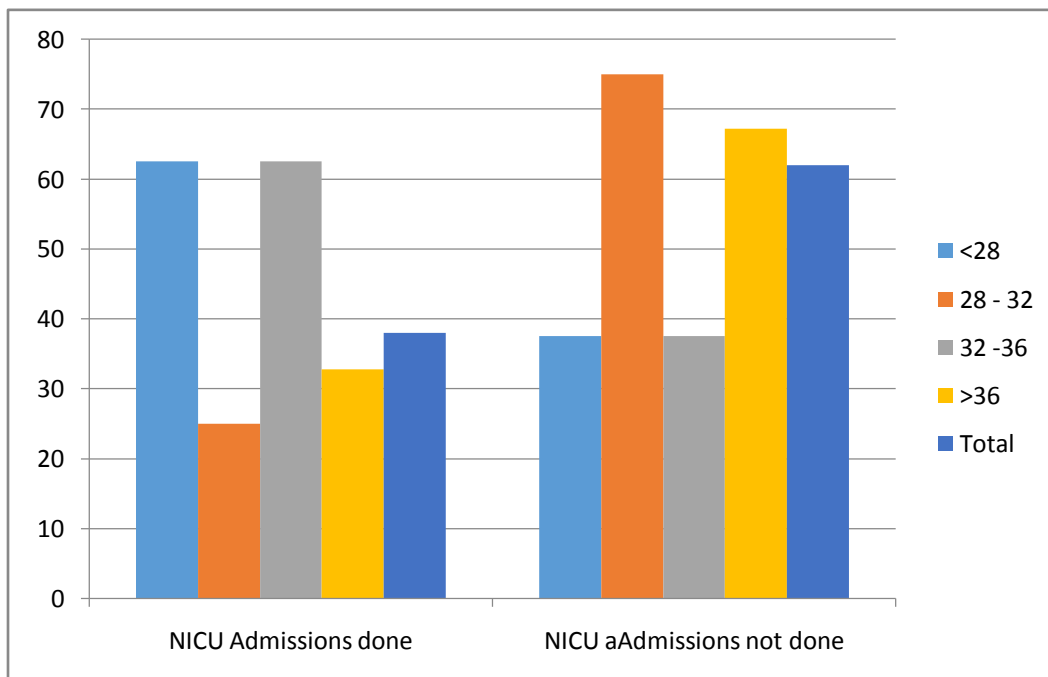
1.5-2	78	0(0)	0(0)	0(0)	78(100)
2-2.5	58	2(3.45)	0(0)	2(3.45)	56(96.55)
≥ 2.5	18	0(0)	0(0)	0(0)	18(100)
Total	200	12(6)	10(5)	22(11)	178(89)



There were 16 perinatal deaths (6 stillbirths, 10 early neonatal deaths) in newborns weighing less than 1 kg, with overall mortality of 100%. The perinatal mortality with newborns weighing 1-1.5 kg was 13.33% (4 stillbirths and no early neonatal deaths). There was no mortality when birth weight was 1.5- 2.0 kg, whereas the perinatal mortality was 3.45% (2 stillbirths) when weighing more than 2 kg. In the normal birth weight of >2.5 kg, there was 100% live birth achieved.

Table 5 : NICU admission with respect to Gestational Age at the time of delivery

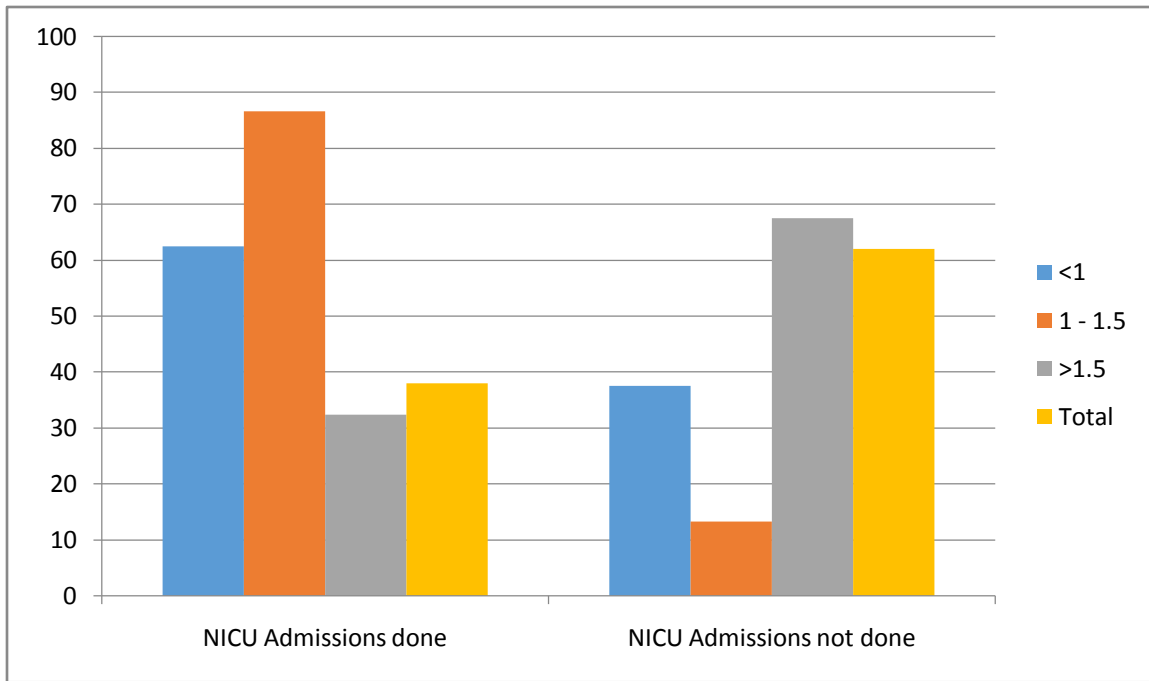
Gestational Age (Weeks)	NICU Admission		Total
	Yes(%)	No(%)	
>28	10(62.5)	6(37.5)	16
28-32	2(25)	6(75)	8
32-36	30(62.5)	18(37.5)	48
≥ 36	42(32.8)	86(67.18)	128
Total	76(38)	124(62)	200



Out of 16 babies born before 28 weeks of gestation, 10 (62.5%) required NICU admission. Among 8 babies born between 28 - 32 weeks of gestation, 2 (25%) required NICU admission. 30 babies were born between 32-36 weeks of gestation and 30 (62.5%) required NICU, whereas 42 out of 128 babies(32.8%) born after 36 weeks of gestation required NICU admission.

Table 6 : NICU admission required with respect to Birth Weight

Birth Weight (Kg)	NICU Admission		Total
	Present	Absent	
< 1	10(62.5)	6(37.5)	16
1 - 1.5	26 (86.6)	4 (13.3)	30
≥ 1.5	50(32.4)	104(67.5)	154
Total	76(38)	124(62)	200

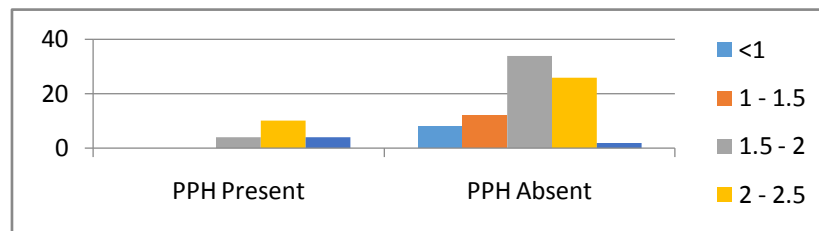


NICU admission was done for about 62.5% of babies born of weight less than 1 kg, and out of 30 babies born with birth weight ranging from 1-1.5 kg, 86.6% required admission. However out of 154 born with birth weight ≥ 1.5 kg only 50 (32.4%) babies required NICU.

Table 7: Maternal Morbidity in terms of Postpartum Haemorrhage according to Birth Weight of Baby

Birth Weight (Kg)	Postpartum hemorrhage	
	Present	Absent
< 1	0(0)	16(8)
1 - 1.5	0(0)	24(12)

1.5-2	8(4)	68(34)
2-2.5	20(10)	52(26)
≥ 2.5	8(4)	4(2)
Total	36(18)	164(82)



There was 4% Maternal Morbidity present in women who delivered babies 1.5-2 kg(each), 10% morbidity in women delivering babies 2-2.5 kg(each). More than 2.5kg(each) baby weight had 4% maternal morbidity and no maternal mortality recorded.

Discussion:

While evaluating the received data, it was evident that twins born to booked patients had no stillbirth and perinatal mortality was 1.72%. In unbooked or referred patients, the perinatal mortality was 23.81% (12 stillbirths and 8 early neonatal deaths). An Ethiopian meta analysis^[1] also revealed that ANC visits are solely responsible to bring down the perinatal mortality, which was supported by the studies conducted in US^[2] and LMICs^[3]. The most plausible explanation for the fall might be the early awareness of pregnancy complications, better nutritional supplementation of Iron and Folic Acid, birth preparedness and complication readiness, intrapartum, postpartum and neonatal care.

While comparing the maternal and fetal outcome in relation to chorionicity, our study reflects that the dichorionic twins show less perinatal mortality (8.10%) than the monochorionic twins (19.23%). A Kerala (India) based study^[5] also showed the mortality rates higher in monochorionic twins (14.7%) than in dichorionic twins (8.6%). In a similar study^[4], it was seen that monochorionic twins had higher antepartum stillbirth than compared to dichorionic twins, most common reason being higher prevalence of TTTS and antepartum hypoxia. This

might be due to haemodynamic imbalance caused by vascular anastomoses between both sides of the placenta.

Outcome of the twin babies and the mother depends on the weeks of gestation till when the pregnancy is carried out. Total of 87.5% mortality was observed before 28 weeks of gestation, and 75% between 28-32 weeks of gestation and no mortality was observed between 32 - 36 weeks of gestation. These results were obtained without considering the chorionicity of the pregnancies. A study of Northern Scotland^[6] suggested that twins born before 37 weeks show a 2 fold increase in the perinatal mortality than compared to those born between 37 -38 weeks. In one of the studies conducted in Netherlands^[7], it was found that preterm births in twin pregnancies had less mortality rates (10.4 per 1000 infants) than those of singleton pregnancies (34.5 per 1000 infants), both studies corresponding to the data of our study.

Weight of the newborns in a twin gestation termination is a major factor for NICU admissions and fetal mortality. The prevalence of NICU stays in babies born before 28 weeks of gestation was 62.5% 25% for those born between 28 - 32 weeks of gestation. 62.5% babies born from 32-36 weeks of gestation required NICU. Out of 128 babies born after 36 weeks of gestation, 42 (32.8%) required NICU admission. In a study by Refuerzo et al^[8], twin pregnancies born moderately and late preterm encounter higher rates of neonatal morbidities compared with twins born at term, which includes main diseases of necrotising enterocolitis, respiratory distress. In the USA. Arianne C. Lim's study^[9] determined that approximately 30% of all preterm infants admitted to the NICU were from twin pregnancies, indirectly showing higher incidence of NICU requirement in twin pregnancies. According to a targeted study conducted for NICU requirement in term twin pregnancies, it was noted that from 2007 to 2010, the rates went from 19.9% to 30.2%, which might be due to more availability of NICUs or more incidence of twin pregnancies due to advent in the Assisted Reproductive Techniques.^[10]

Out of 30 babies born with birth weight ranging from 1-1.5 kg, 26 required NICU admission. However out of 154 born with birth weight ≥ 1.5 kg only 50 babies required NICU, showing that the requirement of neonatal care improves by the improvement in baby weight of the deliveries. This also corresponds with Neonatal mortality data of our study which suggests that all the babies born of <1 kg baby weight could not survive, with the maximum survival rate of 100% in the range of 1.5 - 2 kg. There was 4% maternal morbidity, mainly with respect to postpartum hemorrhage present in women who delivered babies 1.5-2 kg(each) and 10% morbidity in women delivering babies 2-2.5 kg(each), more than 2.5kg(each) baby weight had 4% maternal morbidity and no maternal mortality recorded in the whole study.

According to various studies carried out across the globe, it has been evident that multifetal pregnancies have higher risks of preterm labor, premature rupture of membranes, significant maternal morbidity and maternal near miss, as high as 15.3% in twins when compared to 6.8% of

singletons.^[11] These results have been supported by the data collected by WHO, mentioning the relationship of twin pregnancy and severe maternal morbidity.^[12,13]

CONCLUSION

Multifetal pregnancy comes with high risk associated with them, when compared to their counterpart singleton pregnancies. The risk of accompanying morbidities increases many fold in twin pregnancies, i.e. development of Diabetes Mellitus, PreEclampsia, Anemia, Fetal Growth Restriction in babies etc. The time of delivery shifts to late preterm in majority of cases., the babies born of multifetal pregnancies require more NICU admissions because of the same. Hence, pregnant females should be given extra care during multifetal pregnancies, with more vigilant antenatal care, frequent antenatal visits, counseling regarding institutional deliveries. All these modifications might lead to a significant reduction in maternal and neonatal morbidity and mortality.

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