

Clinical Profile and Outcome of Newborns in Multiple Pregnancies in Tertiary Care Hospital in Karimnagar, Telangana, India.

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ABSTRACT

Introduction

Twins form a high-risk group of newborns because of their tendency for premature births and intrauterine growth retardation. As a result of multiple pregnancy, the normal ability of the woman to adapt herself to the needs of pregnancy are significantly altered. Twin birth is associated with increased risk of neonatal morbidity and mortality and disadvantages in growth and neuro-developmental status than singletons.

Aim and objectives

1. To study the clinical profile and outcome of newborns in multiple pregnancies in a tertiary care hospital.
2. To study the predictors of outcome of newborns in multiple pregnancies.

Material and methods

The study was a hospital based prospective observational study on all twin neonates- 60 neonates (30 twin pairs) who were admitted in the NICU of department of paediatrics in Chalmeda Anand Rao institute of medical sciences during the study period from December 2021- June 2022. For each case a detailed antenatal, maternal history is taken, along with risk factors and mode of delivery. A detailed note of the conditions of the twins, the time of gestation at delivery, birth weight, APGAR score, immunization status and diagnosis for which they were admitted are taken. Lab investigations were also advised.

Results

The overall mean age of mothers was 28.15 ± 1.32 years. Among the study population 26.67% had family history of twinning. 40% of the study population had risk factors. Among the risk factors, gestational hypertension contributed to 16.67%. Anaemia, Gestational diabetes and Urinary tract Infection contributed to 6.67% each. One case (3.33%) of pre-eclampsia was noted. 43.34% of the study population were delivered at 35-36 weeks of gestation, 26.67% were delivered at 33-34 weeks. 23.33% were delivered at 37-38 weeks. Only 6.66% were delivered at 30-32 weeks. 40% of the neonates did not require any resuscitation whereas, 60% required resuscitation measures. Among the 60%, 13.33% required basic steps of resuscitation, 35% required Bag and Mask ventilation and 11.67% required intensive care. Among the study population 80% of the babies were born appropriate to gestational age and 20% of the babies were born as small for gestational age. Sepsis screening was positive in 16.67%. 78.34% of these twin neonates were discharged and 21.67% succumbed to the condition.

Conclusions

The predictors of outcome were maternal age, gestational age at delivery, family history of twinning, and maternal risk factors. The fetal factors that were significantly associated with outcome were the need for resuscitation, AGA/LGA babies and birth weight of the neonates.

Keywords- Multiple pregnancy, gestational age, Appropriate for gestational age, large for gestational age, small for gestational age.

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I. INTRODUCTION

Twin pregnancies have been increasing in incidence all over the world and in India. Perinatal morbidity and mortality are also higher in twin pregnancies. Prematurity and low birth weight are the two major causes for the perinatal morbidity and mortality.^{1,2} Other causes in the list are fetal malpresentations and complications associated with labour. These issues make twin gestation a high-risk gestation. Twin pregnancies are always a major cause of concern and the mode by which they are delivered is a problem to the obstetricians.³

Incidence of twins:

The incidence of multiple pregnancies varies significantly among different regions, countries and populations. In several overview studies (since the early 1970) it was found that natural twinning rates were less than 8 twin births per 1000 births in East Asia and Oceania, 9-16 per 1000 births in Europe, USA and India, 17 and more per 1000 births in African countries.⁴⁻⁸

Smith et al reported that India has twinning rates below 9 per 1000 births⁹. Differences in twinning rates among countries are mainly due to variations in the frequencies of dizygotic twinning.

Rate of monozygotic twinning is relatively constant (3.5-4 per 1000 births).⁴ Monozygotic twinning has no correlation with maternal age, race, parity and heredity. However, dizygotic twinning is affected by maternal age, maternal height, race, parity, heredity, smoking habit, use of oral contraceptives and use of assisted reproductive techniques (ART).¹⁰⁻¹²

Twins may be identical (monozygotic) or non-identical and fraternal (dizygotic).

Dizygotic twins-

They are formed as a result of fusion of two ova by two separate sperms, the genetic composition of the two zygotes is different. Dizygotic twinning depends on conditions like age of the mother, race to which she belongs, pre-conceptional weight, obstetric history and the time of year of the conception. The levels of gonadotropic hormones in maternal blood of dizygotic twins are found to be increased.³

Monozygotic twins- These are twins which develop from a single ovum and are identical in nature. This occurs as a random genetic event. The three types are as follows:

- **Dichorionic diamniotic:** When the splitting occurs within 4 days of fertilization.
- **Monochorionic diamniotic:** If the splitting tends to occur between the 4 the day to 7 the day of fertilization.
- **Monochorionic monoamniotic:** If it occurs > than 7 days after fertilization.
- **Conjoined twins:** When the twinning event occurs late at around 13 to 14 days after the event of fertilization conjoined twins are formed.

Complications of twin pregnancies:¹³

Maternal: The most common maternal complications that are reported are:

- a. Nutritional anemia
- b. Pregnancy induced hypertension
- c. Antepartum hemorrhage
- d. Polyhydramnios
- e. Preterm labor
- f. Postpartum hemorrhage

Fetal:

The major complication of twinning is prematurity and increased mortality¹³. Neonatal complications of twin gestations especially prematurity account for significant utilization of neonatal care. There is limited research on the clinical profile and outcomes of newborns in multiple pregnancies. Hence this study was taken up to study the clinical profile and outcomes of newborns in multiple pregnancies.

Aim and objectives

1. To study the clinical profile and outcome of newborns in multiple pregnancies in a tertiary care hospital.
2. To study the predictors of outcome of newborns in multiple pregnancies.

II. Materials and methods

Study Design: Hospital based prospective observational study

Study Sample Size: 60 (30 twin pairs)

Study Population: All twin neonates who were admitted in the NICU of Department of Paediatrics, Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar, during the study period.

Study centre: The study was conducted in the Department of Paediatrics, Chalmeda Anand Rao Institute of Medical Sciences, a tertiary care centre in Karimnagar.

Study period: 18 months (December 2021– June 2022)

All twin neonates who were admitted in the NICU satisfying the inclusion criteria were enrolled into the study and admitted after getting informed consent from the parents/guardians.

Inclusion Criteria:

- All live twin babies of Gestational Age > 28 weeks.
- Parents/guardians of neonates with the above-mentioned criteria who are willing to give informed consent.

Exclusion criteria:

- Twins diagnosed to have congenital anomalies non compatible to life.
- Twins of birth weight < 800 gms.
- Parents or guardians those who are not willing to give informed consent.

Method:

For each case, a detailed antenatal and maternal history including the age of the mothers, parity, and history of consanguinity were obtained by reviewing the maternal and labour ward records and by interviewing the parents. A detailed history of risk factors and mode of delivery was obtained. A detailed note on the condition of the twins, time of gestation at delivery, birth weight, APGAR score, Immunization status and diagnosis for which they were admitted into NICU were noted.

The lab investigations were also advised, which were, Complete Blood Picture, Sepsis Screen, Serum calcium, Blood Sugar levels, Serum Bilirubin, Serum electrolytes and 2DECHO.

Institutional ethical committee approval:

Ethical clearance was obtained from the Institutional Ethical Committee, Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar.

Statistical analysis:

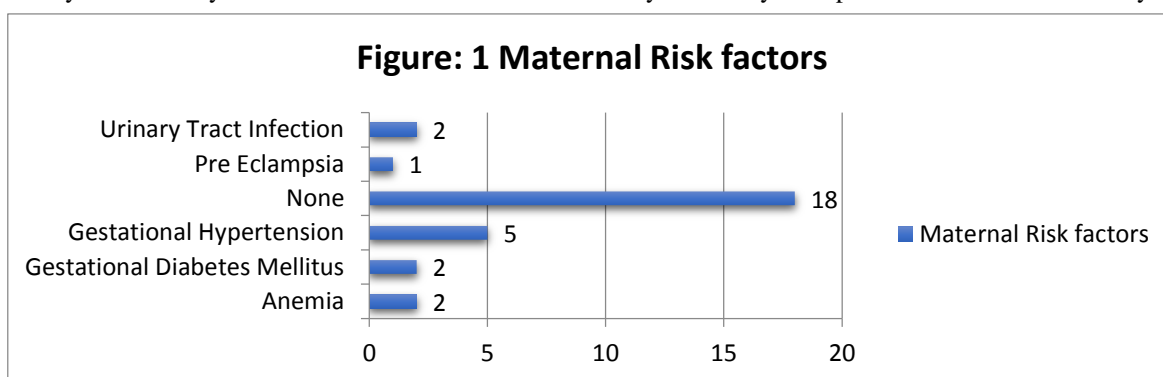
The data was entered in Microsoft Excel 2010 version. Data was analysed using Microsoft Excel 2010 and Epi Info 7.2.0. Descriptive and inferential statistical analysis were used in the present study. Results on continuous measurements were presented on Mean \pm SD (Min-Max) and results on categorical measurements were presented in Number (%). Significance was assessed at 5% level of significance. Student t-test is used to compare inter group variation for continuous variables. Pearson's Correlation Co-efficient was used to assess the relationship between the two variables.

III. Results

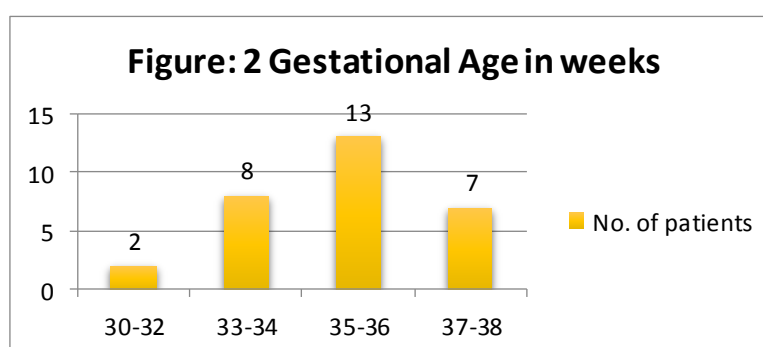
Maternal characteristics

60% of the mothers belonged to 27-28 years of age, followed by 30% belonged to 29-30 years. 25-26 years contributed to 6.66% and >30 years contributed to 3.33%. The overall mean age of mothers was 28.15 \pm 1.32 years. Primi gravidas contributed to 43.33%, followed by 40% who were gravida II and 16.67% belonged to gravid III. 30.33% of the mothers studied, were married for 5 years, followed by 26.67% who were married

for 4 years and 6 years each. 10% were married for 10 years. Only one patient was married for 3 years.



56.67% of the women conceived by using assisted reproductive techniques. 43.33% conceived spontaneously. Among the study population, 26.67% had family history of twinning. 40% of the women (i.e., 12) had risk factors. Among the risk factors, gestational hypertension contributed to 16.67% (i.e., 5). Anaemia, Gestational diabetes and Urinary tract Infection contributed to 6.67% (i.e., 2) each. One case (3.33%) of pre-eclampsia was noted. Figure 1 gives a bar chart representation of all the risks identified in the study population. Among the study population, 43.34% (i.e., 13) delivered at 35-36 weeks of gestation, 26.67% (i.e., 8) delivered at 33-34 weeks. 23.33% (i.e., 7) delivered at 37-38 weeks. Only 6.66% (i.e., 2) delivered at 30-32 weeks. Figure 2 shows a graphical representation of the above data. 60% of the deliveries were late preterm. 23.33% of the deliveries were term. 16.66% were early preterm. Majority (73.33%) of the deliveries were LSCS. Only 26.7% were spontaneous normal vaginal deliveries.



Fetal characteristics

Among the twins born, 55% were males and 45% were females. The total study population included 76.67% pre terms. 23.33% term babies. Among the term babies, APGAR was 6 at 1 min in 5% of the cases, 7 in 7.23% of the babies and 8 in 10% of the babies. APGAR at 5 min was 8 in 1.67% of the cases, 9 in 3.33% of the babies and 10 in 18.33% of the babies. 40% (i.e., 24) of the babies did not require any resuscitation. 60% (i.e., 36) of them required resuscitation measures. Amongst the 60%, 13.33% (i.e., 8) required basic steps of resuscitation, 35% (i.e., 21) required Bag and Mask ventilation and 11.67% (i.e., 7) required intensive care. Figure 3 depicts the statistics of the babies that needed resuscitation. Only 13.33% of the neonates had birth weight >2500 grams. 68.33% were low birth weight babies. 15% were very low birth weight babies and 3.33% were extremely low birth weight babies. Among the study population, 80% of the babies were born appropriate for gestational age and 20% of the babies were born as small for gestational age.

60% of the neonates studied were immunized and 40% of the babies were not immunized. 3.33% of the neonates had congenital anomalies, compatible with life- patent ductus arteriosus (PDA). The rest had no congenital anomalies. In the neonates studied 75% were normal, 21.67% had tachypnoea and 3.33% had tachycardia. All the neonates were tested and 53.33% had complete blood picture with in normal limits. 30% had anaemia, 10% had both anaemia and thrombocytopenia. Polycythaemia and thrombocytopenia contributed to 3.33% each. Sepsis screening was positive in 16.67% of the neonates. 81.67% had normal serum calcium levels. 18.33% had hypocalcaemia. Among the study population, 81.67% were having normal GRBS levels. 18.33% had hypoglycaemia. 71.67% of the neonates tested had normal serum bilirubin levels. 28.33% had high levels.

Among the study population, seizure activity was noted in 16.67%. In the twin babies, 75% had normal serum electrolyte levels. 18.33% had high sodium levels and 6.67% had low potassium levels. 78.34% of the twin neonates were discharged and 21.67% succumbed to the condition.

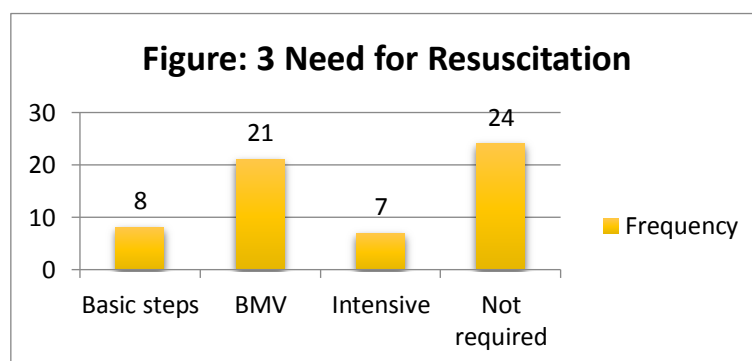


Table 1: Summarising the significant predictors of outcome

IV. DISCUSSION

The study was conducted with the objective of studying the clinical profile and outcome of newborns in multiple pregnancies in a tertiary care hospital. The results of which have been discussed earlier, the statistically significant factors both maternal and fetal have been mentioned below. The mean difference between the maternal age among the neonates who were discharged and neonates who died was statistically significant. The mean gestational age of delivery was higher for the neonates who were discharged. The mean difference between the gestational age at delivery of neonates who were discharged and neonates who died was statistically significant. Higher the gestational age at delivery, better the outcome of the neonate. The association between the family history of twinning and outcome was statistically significant. The association between the maternal risk factors and outcome was statistically significant. The association between need for resuscitation and the outcome was statistically significant. The association between the AGA/SGA of the neonate and the association between the birth weight of the neonate and outcome was statistically significant.

A retrospective observational study was conducted by Adelaiye SM et al¹⁴. among women who had multi-fetal pregnancy in ABUTH Zaria over a period of 5 years. The total number of deliveries during the study period was 9399 out of which 254 were twins and 2 were higher order multifetal pregnancies. Parity, ethnicity, maternal age, ovulation induction, and family history were the major determinants of multifetal pregnancies. There was association between presentation and mode of delivery and also the birth weight and Apgar score of the leading twins. The multifetal pregnancy rate and cesarean section rate were high, associated with high maternal and perinatal morbidity and mortality.

A prospective observational study was conducted by Yeasmin et al¹⁵ in Chattogram-Maa-O-Shishu-Hospital Medical College, from July 2014 to June 2016. The results show that the number of multiple pregnancies delivered during study periods was 173 with the incidence of 1.7% among total deliveries. The main maternal adverse outcomes were preterm delivery, anemia, pregnancy induced hypertension, premature rupture of membrane, postpartum hemorrhage, and antepartum hemorrhage. The most common neonatal complications were low birth weight and most common cause of neonatal death was prematurity and neonatal sepsis.

Nair JS¹⁶, studied 80 twins, out of which preterm deliveries constituted 87.5% of all deliveries. Significant influence on neonatal mortality was seen only with discordant twins. Ghanghoriya PK et al¹⁷, conducted a prospective observational study in a tertiary care NICU among 81 pairs of twins (162 neonates). Mortality was inversely proportional to birth weight and gestational maturity and directly proportional to birth weight discordance. there was high incidence of abnormal neurodevelopmental outcome among twins according to gestational age. Hypoglycemia, Perinatal asphyxia, RDS, and NEC were risk factors of NDD. The authors concluded that there are higher incidence adverse outcomes in terms of morbidity, mortality, growth and development among twins.

In a review article by Santana DS et al¹⁸. concluded that a twin pregnancy is associated with several maternal complications, including SMM and MNM as well as perinatal mortality and morbidity. The second twin has worse outcomes, possibly due to the delivery, its safety conditions and identification of high-risk groups.

A study done by Singh L et al¹⁹. the incidence of twins in this study was 1.85%. They concluded that good antenatal care, with increased rest and nutritional supplementation, early detection of fetal and maternal

complications together with thorough intra-natal and postnatal vigilance, can lower both maternal and fetal dangers.

In a study done by Yadav CM et al²⁰. incidence of multiple pregnancies in present study was 1.09%, of which 235 are twins, 6 triplets and 1 quadruplet. Multiple pregnancies are associated with increasing risk for mother and baby. Gestational age, birth weight and intertwin delivery interval are important determinants of neonatal outcome. Earlier determination of chorionicity is useful in assessing the prognosis of multifetal gestation as mono-chorionicity has significant association with perinatal mortality. In study done by Bhavana. S.²¹ 48 cases of multiple pregnancies were enrolled in the study. The multifetal gestation was associated with increased maternal complications compared to singleton pregnancy. The mortality was higher in low-birth-weight babies, higher order births, non-vertex presentation and male fetuses.

In a review article written by Vogel JP et al²². maternal and neonatal characteristics in twin deliveries in 23 Low- and middle-income countries and conducted multi-level logistic regression to determine the association between twins and adverse maternal and perinatal outcomes. The study revealed that Odds of severe adverse maternal outcomes (death, blood transfusion, ICU admission or hysterectomy) and perinatal mortality in twin pregnancies were higher, however early neonatal death and stillbirth did not reach significance.

Present study	Significant predictors of outcome
Maternal factors	Maternal age, Gestational age at delivery, Family history of twinning, Maternal risk factors.
Fetal Factors	Need for resuscitation, AGA/LGA babies and Birth weight of the neonates.

V. CONCLUSION

The study was conducted with the objective of studying the clinical profile and outcome of newborns in multiple pregnancies in a tertiary care hospital. The predictors of outcome were maternal age, gestational age at delivery, and family history of twinning, maternal risk factors. The fetal factors that were significantly associated with outcome were the need for resuscitation, AGA/LGA babies and birth weight of the neonates.

CONFLICT OF INTEREST: NIL

FUNDING: NIL

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