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ASSOCIATION OF CHORIONICITY WITH PERINATAL MORTALITY IN TWIN PREGNANCIES: A PROSPECTIVE OBSERVATIONAL STUDY AT A TERTIARY CARE CENTRE

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ABSTRACT

Background: Twin pregnancies are associated with significantly higher perinatal morbidity and mortality compared to singleton gestations. Chorionicity can a key determinant influencing fetal growth, inter-twin complications, and perinatal survival. Monochorionic twins are particularly vulnerable due to shared placental circulation and associated complications such as twin–twin transfusion syndrome, selective fetal growth restriction, and cord accidents.
Objective: To evaluate the association between chorionicity and perinatal mortality in twin pregnancies managed at a tertiary care centre.
Materials and Methods: This prospective observational study was conducted in the Department of Obstetrics and Gynecology at a tertiary care teaching hospital. A total of 100 women with twin pregnancies (200 neonates) beyond 28 weeks of gestation were included. Chorionicity was determined by post-delivery placental examination and categorized as dichorionic-diamniotic (DCDA), monochorionic-diamniotic (MCDA), and monochorionic-monoamniotic (MCMA). Perinatal mortality included stillbirths and early neonatal deaths. Data were analysed descriptively and expressed as numbers and percentages.
Results: Dichorionic-diamniotic placentation was the most common type, observed in 67% of twin pregnancies, followed by monochorionic-diamniotic in 29% and monochorionic-monoamniotic in 4%. Out of 38 total perinatal deaths, 22 cases occurred in monochorionic pregnancies (MCMA + MCDA), while 16 cases occurred in dichorionic-diamniotic pregnancies. Live birth was higher in dichorionic pregnancies (88.06%) compared to monochorionic pregnancies (66.67%).
Conclusion: Monochorionic twin pregnancies are associated with significantly higher perinatal mortality compared to dichorionic pregnancies (P<0.001). Early determination of chorionicity and intensified antenatal surveillance are essential to improve perinatal outcomes in twin gestations.

Keywords: *Twin pregnancy; Chorionicity; Perinatal mortality; Monochorionic twins; Placental type.*

INTRODUCTION

Twin pregnancies constitute a unique high-risk obstetric group due to their strong association with adverse perinatal outcomes. Although twins represent a small proportion of total births, they contribute disproportionately to perinatal morbidity and mortality worldwide [1]. The increasing incidence of twin pregnancies over recent decades has been attributed to advanced maternal age and widespread use of assisted reproductive technologies [2].

Among the various factors influencing outcomes in twin gestations, chorionicity plays a pivotal role. Chorionicity determines the placental architecture, degree of vascular anastomoses, and intrauterine environment shared by the fetuses [3]. Dichorionic twins have separate placental circulations and generally demonstrate better perinatal outcomes, whereas monochorionic twins share a single placenta, predisposing them to complications such as twin–twin transfusion syndrome, selective fetal growth restriction, cord entanglement, and sudden intrauterine fetal demise [4,5].

Several studies have reported significantly higher perinatal mortality rates in monochorionic twins compared to dichorionic twins, even after adjusting for gestational age and birth weight [6,7]. The risk is particularly pronounced in monochorionic-monoamniotic pregnancies, which are associated with cord accidents and extreme prematurity [8].

In low- and middle-income countries, delayed diagnosis of chorionicity, limited access to specialized antenatal surveillance, and inadequate neonatal intensive care facilities further exacerbate the adverse outcomes associated with monochorionic twin gestations [9]. Institution-based prospective data are therefore essential to understand local patterns of chorionicity-related perinatal mortality and to guide evidence-based clinical management.
The present study was undertaken to assess the distribution of placental types in twin pregnancies and to evaluate the association between chorionicity and perinatal mortality in a tertiary care setting.

OBJECTIVE

To assess the association between chorionicity and perinatal mortality in twin pregnancies.

MATERIALS AND METHODS

This prospective observational study was conducted in the Department of Obstetrics and Gynecology at Government Medical College and Associated Group of Hospitals, Kota, Rajasthan. A total of 100 women with twin pregnancies beyond 28 weeks of gestation were enrolled after obtaining informed consent.

Inclusion criteria included all diagnosed twin pregnancies admitted for delivery during the study period. Pregnancies with major congenital anomalies incompatible with life and incomplete records were excluded.
Chorionicity was determined by placental examination after delivery and classified as:

- Dichorionic-diamniotic (DCDA)
- Monochorionic-diamniotic (MCDA)
- Monochorionic-monoamniotic (MCMA)

Perinatal mortality included stillbirths and early neonatal deaths occurring within the first seven days of life. Data were recorded in a structured proforma and analysed using descriptive statistics. Results were expressed as frequencies and percentages.3

RESULTS

Out of 100 twin pregnancies, dichorionic-diamniotic placentation was observed in 67 cases (67%), making it the most common type. Monochorionic-diamniotic placentation was noted in 29 cases (29%), while monochorionic-monoamniotic placentation was seen in 4 cases (4%) (Table 1).

A total of 38 perinatal deaths were recorded among 200 neonates. Of these, 22 deaths (33.33%) occurred in monochorionic pregnancies (MCMA + MCDA), whereas 16 deaths (11.94%) occurred in dichorionic-diamniotic pregnancies (Table 2). Live birth rates were higher in dichorionic-diamniotic pregnancies, with 118 live births out of 134 neonates (88.06%), compared to monochorionic pregnancies, which had 44 live births out of 66 neonates (66.67%). This clearly demonstrates a higher perinatal mortality burden among monochorionic twin gestations. The difference was observed to be statistically significant on applying Chi-square test ($P<0.001$).

Table No. 1: Type of Placenta in Females with Twin Pregnancy

Type of Placenta	Number	Percentage
Dichorionic – Diamniotic (DCDA)	67	67%
Monochorionic – Diamniotic (MCDA)	29	29%
Monochorionic – Monoamniotic (MCMA)	4	4%
Total	**100**	**100%**

Table No. 2: Chorionicity and Perinatal Mortality

Chorionicity	Total Neonates (n)	Perinatal Mortality	Perinatal Mortality
MCMA + MCDA	66	22	33.33%

DCDA	134	16	11.94%
Total	**200**	**38**	19.00%

Chi-square = 11.797 with 1 degree of freedom; P = 0.000

DISCUSSION

The present study demonstrates a clear association between chorionicity and perinatal mortality in twin pregnancies. Dichorionic-diamniotic placentation was the most common type, accounting for 67% of cases, a finding consistent with previously published Indian and international studies [10,11].

Perinatal mortality was significantly higher in monochorionic pregnancies, with 33.33% of perinatal deaths occurring in MCMA and MCDA twins, compared to 11.94% in dichorionic twins. This observation aligns with earlier reports that highlight monochorionicity as an independent risk factor for adverse perinatal outcomes [6,12].

The higher mortality observed in monochorionic twins can be attributed to shared placental circulation, vascular anastomoses, and complications such as twin–twin transfusion syndrome and selective fetal growth restriction [4,13]. Published studies by Dr Nivedita et al. also emphasize the contribution of placental factors and prematurity to perinatal mortality in high-risk pregnancies [14,15].

In contrast, dichorionic twins benefit from separate placental circulations, resulting in higher live birth rates, as demonstrated by the 94% survival observed in the present study. Similar survival advantages of dichorionic placentation have been reported in other prospective observational studies [10,11].

These findings underscore the importance of early antenatal determination of chorionicity, close fetal surveillance, and timely referral to tertiary care centres for monochorionic twin pregnancies. Improved antenatal monitoring and neonatal care services may significantly reduce perinatal mortality in this high-risk group.

CONCLUSION

Monochorionic twin pregnancies are associated with significantly higher perinatal mortality compared to dichorionic-diamniotic pregnancies ($P<0.001$). Chorionicity is a critical determinant of perinatal outcome in twin gestations. Early diagnosis, vigilant antenatal surveillance, and optimized perinatal care are essential to improve survival in monochorionic twin pregnancies.

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DECLARATION

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