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EFFECT OF BIRTH WEIGHT ON PERINATAL MORTALITY IN TWIN PREGNANCIES: A PROSPECTIVE OBSERVATIONAL STUDY AT A TERTIARY CARE CENTRE

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ABSTRACT

Background: Twin pregnancies are inherently associated with increased perinatal morbidity and mortality, largely attributable to preterm birth and low birth weight. Birth weight is a critical determinant of neonatal survival, particularly in multiple gestations, where intrauterine growth restriction and prematurity are common.
Objective: To evaluate the effect of birth weight on perinatal mortality in twin pregnancies delivered at a tertiary care centre.
Materials and Methods: This prospective observational study was conducted at a tertiary care hospital over the study period as defined in the thesis. A total of 100 twin pregnancies (200 neonates) were included. Birth weights were categorized into five groups: <999 g, 1000–1499 g, 1500–1999 g, 2000–2499 g, and ≥2500 g. Perinatal mortality, defined as stillbirths and early neonatal deaths, was analyzed in relation to birth weight. Data were compiled from institutional records and analyzed using descriptive statistics.
Results: Of the 200 neonates, 88% had low birth weight (<2500 g). The largest proportion of neonates (33.5%) weighed between 1500–1999 g, followed by 32.5% in the 2000–2499 g category. Perinatal mortality showed a strong inverse relationship with birth weight. All 19 neonates weighing <999 g resulted in perinatal deaths (100%). Among neonates weighing 1000–1499 g, 12 perinatal deaths (48%) were observed. Mortality decreased substantially in higher weight categories, with 5.9% mortality in the 1500–1999 g group and 4.6% in 2000–2499 g group. No perinatal deaths were recorded among neonates weighing ≥2500 g.
Conclusion: Birth weight is a major determinant of perinatal mortality in twin pregnancies. Extremely low and very low birth weight neonates contribute disproportionately to perinatal deaths. Strategies aimed at prolonging gestation and improving fetal growth may significantly reduce perinatal mortality in twin gestations.

Keywords: *Twin pregnancy; Birth weight; Perinatal mortality; Low birth weight; Multiple gestation.*

INTRODUCTION

Twin pregnancies account for a small proportion of all gestations but contribute disproportionately to perinatal morbidity and mortality worldwide [1]. Advances in assisted reproductive technologies and delayed childbearing have led to a steady rise in the incidence of twin pregnancies, particularly in developing countries [2]. Despite improvements in antenatal and neonatal care, perinatal outcomes in twins remain inferior compared to singleton pregnancies.

Low birth weight is one of the most significant contributors to adverse perinatal outcomes in twin gestations [3]. Twins are more likely to be born preterm and growth restricted due to shared uterine space, placental insufficiency, and

increased maternal complications such as hypertensive disorders and anemia [4]. Consequently, more than half of twins weigh less than 2500 g at birth, placing them at a higher risk of stillbirth, early neonatal death, respiratory distress, sepsis, and long-term neuro-developmental impairment [5].

Perinatal mortality in twins shows a strong inverse relationship with birth weight and gestational age at delivery [6]. Extremely low birth weight (<1000 g) and very low birth weight (1000–1499 g) neonates experience the highest mortality rates, especially in resource-limited settings where access to advanced neonatal intensive care may be constrained [7]. Identifying the contribution of specific birth-weight categories to perinatal deaths is essential for targeted interventions and resource allocation.

Although several studies have evaluated perinatal outcomes in twin pregnancies, limited prospective data are available from tertiary care centres in developing countries focusing specifically on birth weight as an independent determinant of perinatal mortality [8]. This study aims to bridge this gap by analyzing the distribution of birth weights among twins and assessing their association with perinatal mortality using prospectively collected institutional data.

OBJECTIVE: To study the effect of birth weight on perinatal mortality in twin pregnancies.

MATERIALS AND METHODS

This prospective observational study was conducted at a tertiary care centre, as described in the thesis. The study included 100 women with twin pregnancies who delivered during the study period. A total of 200 neonates were analyzed.

All twin pregnancies delivered at the study centre delivered out of both vaginal as well as caesarean deliveries were included in the study. While, cases with major congenital anomalies incompatible with life were excluded. Maternal and neonatal data were collected prospectively using structured proformas. Birth weight was recorded immediately after delivery using a calibrated weighing scale. Neonates were categorized into five groups, i.e., <999 g; 1000–1499 g; 1500–1999 g; 2000–2499 g; and ≥2500 g.

Outcome Measure, Perinatal mortality, defined as stillbirths and early neonatal deaths, was analyzed in relation to birth weight. Data were analyzed using descriptive statistics and expressed as numbers and percentages. Chi-square test was applied to establish level of significance in categorical data. P value of less than 5% (0.05) was considered as significant.

RESULTS

Out of 200 neonates, the majority had low birth weight (<2500 g) (Table 1).A total of **38 perinatal deaths** were recorded, accounting for an overall perinatal mortality rate of **19%**(Table 2).Overall, **176 neonates (88%)** weighed less than 2500 g at birth. Perinatal mortality decreased progressively with increasing birth weight. (P<0.05)

Table 1: Birth Weight of Twins

Birth weight (grams)	No.of neonates	Percentage
<999	19	9.5%
1000-1499	25	12.5%
1500-1999	67	33.5%
2000-2499	65	32.5%
>2500	24	12%
Total	**200**	**100%**

Table 2: Birth Weight and Perinatal Mortality

Birth weight in grams	Total No.of neonates	Perinatal deaths	% Perinatal mortality
<999	19	19	100%
1000-1499	25	12	48%
1500-1999	67	4	5.9%
2000-2499	65	3	4.6%
>2500	24	0	0%
Total	**200**	**38**	**19%**

Chi-Square test = 116.421 with 4 degrees of freedom; P=0.000 (S)

DISCUSSION

The present study demonstrates a strong inverse relationship between birth weight and perinatal mortality in twin pregnancies. Extremely low birth weight neonates (<999 g) accounted for the highest mortality, with no survivors in this

category. Similar findings have been reported in previous studies, highlighting the limited viability of extremely low birth weight twins, particularly in low-resource settings [9].

Very low birth weight neonates (1000–1499 g) also contributed substantially to perinatal deaths, with nearly half of neonates in this group not surviving the perinatal period. This emphasizes the vulnerability of this weight category and the need for advanced neonatal support [10].

In contrast, neonates weighing ≥1500 g showed markedly improved survival, with mortality rates falling below 6%. No perinatal deaths were observed among neonates weighing ≥2500 g, underscoring the protective effect of adequate fetal growth. These findings are consistent with earlier reports indicating that birth weight is a more powerful predictor of survival than plurality alone [11,12].

The high proportion of low birth weight neonates (88%) observed in this study reflects the intrinsic risks associated with twin gestations, including preterm delivery and growth restriction. Improving antenatal surveillance, optimizing maternal nutrition, and preventing preterm birth may significantly reduce perinatal mortality in twins [13].

The high prevalence of low birth weight observed in this cohort is consistent with previously published institutional studies from similar tertiary care settings. Dr. Pooja Kumari et al.[14] reported that 66% of twins were low birth weight and 22% were very low birth weight, emphasizing the intrinsic vulnerability of twin gestations to growth restriction and prematurity. The current study further refines this observation by demonstrating a stepwise decline in perinatal mortality with increasing birth weight, highlighting birth weight as a clinically actionable prognostic factor.

Perinatal mortality of 100% among neonates weighing less than 999 g in the present study mirrors outcomes reported in other Indian tertiary centres, where survival of extremely low birth weight twins remains poor despite advances in neonatal care [10,12,13]. Similarly, nearly half of neonates in the 1000–1499 g category did not survive the perinatal period, underscoring the limited physiological reserves and high susceptibility to respiratory distress syndrome, sepsis, and birth asphyxia in this weight group.

A marked reduction in perinatal mortality was observed among neonates weighing ≥1500 g. This trend is supported by the findings of Dr. Pooja Kumari et al.[15], who demonstrated improved neonatal survival with increasing birth weight and gestational maturity in twin pregnancies . The convergence of evidence suggests that strategies aimed at preventing extreme prematurity and enhancing fetal growth could substantially reduce perinatal deaths.

The absence of perinatal deaths among neonates weighing ≥2500 g in the present study further emphasizes the protective effect of adequate birth weight. Comparable observations have been reported in prior prospective studies, where twins achieving higher birth weights had survival outcomes approaching those of singleton pregnancies [11,12]. This highlights the importance of optimized antenatal surveillance, maternal nutrition, and timely referral to tertiary centres.

Although the study by Dr. Nivedita Tiwary et al.[16] primarily focused on maternal and perinatal outcomes in women with PCOS, their findings underline the broader principle that improved antenatal management and reduction in preterm delivery contribute significantly to better perinatal outcomes, including improved birth weights and neonatal survival . These observations indirectly support the current study's findings by reinforcing the role of antenatal interventions in improving perinatal outcomes.

Overall, the findings of the present study are consistent with existing literature and strengthen the evidence that birth weight is a major, independent predictor of perinatal mortality in twin pregnancies. Targeted strategies to prolong gestation and optimize fetal growth remain central to improving perinatal survival.

CONCLUSION

Birth weight is a critical determinant of perinatal mortality in twin pregnancies. Extremely low and very low birth weight neonates contribute disproportionately to perinatal deaths, while survival improves significantly with increasing birth weight. Strategies aimed at prolonging gestation and enhancing fetal growth are essential to improve perinatal outcomes in twin gestations.

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