Frequency of Preterm Birth in Multiple Gestations Presenting at Mardan Medical Complex

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Abstract: *Multiple gestations are associated with increased maternal and neonatal risks, with preterm birth being one of the most significant contributors to perinatal morbidity and mortality. Identifying the frequency and associated factors of preterm birth in multiple pregnancies is essential for improving obstetric outcomes, particularly in resource-limited settings.* **Objective:** *To determine the frequency of preterm birth in women with various gestations presenting at Mardan Medical Complex, Mardan.* **Methods:** *This cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Mardan Medical Complex, Mardan, from August 15, 2024, to February 15, 2025. A total of 78 women with multiple gestations, defined as the simultaneous development of more than one fetus in the uterus, were included. Preterm birth was defined as delivery before 37 completed weeks of gestation. Data were analyzed using SPSS version 27, and preterm birth was reported as frequencies and percentages. Associations between variables were assessed, with a p-value <0.05 considered statistically significant.* **Results:** *The mean maternal age was 28.67 ± 6.94 years. Preterm birth occurred in 32 women (41.0%). Caesarean section was the predominant mode of delivery, accounting for 56 cases (71.8%). A statistically significant association was observed between maternal education and preterm birth, with 27 (84.4%) of women who delivered preterm being uneducated (p < 0.001).* **Conclusion:** *The frequency of preterm birth in multiple gestations was high in the present study. Lack of maternal education was significantly associated with an increased risk of preterm delivery. Targeted antenatal care and educational interventions may help reduce preterm birth rates in women with multiple pregnancies.*

Keywords: Preterm Birth, Multiple Gestation, Maternal Education, Risk Factors

Introduction

Multifetal gestations carry elevated risks in comparison to singleton pregnancies. The scientific community has engaged in extensive debate concerning the most suitable method of delivery to twin gestations. The guidelines issued by ACOG indicate that, generally, twin gestation does not warrant a C-section. Additional debate has emerged concerning the classification of multiple pregnancies that might be suitable for vaginal delivery (1-3). This is due to the associated hazards, including the likelihood of a change in foetal lie after delivery of the first twin, danger of placental abruption that results from sudden decompression of the uterus after delivery of the first twin, and alterations in cervical dilation, which could impede delivery of the second twin (3-5).

During the study period, a total of 5285 deliveries occurred, including significant numbers of twin pregnancies (2.95%) and triplet pregnancies (0.21%). Among 21,400 pregnancies, there were 427 cases of multiple gestation, representing approximately 1.99% of the total. During a decade-long study, 65.1% cases of numerous pregnancies culminated in preterm births. Approximately 64.3% have been determined as monochorionic twins, whereas 35.7% were classified as dichorionic twins (6). A significant risk factor associated with preterm birth remains chorionicity, as twins born in monochorionic pregnancies exhibit elevated rates for neonatal complications and death (7, 8).

The factors contributing to premature birth within multiple pregnancies are complicated and involve various elements. Despite advancements in medical treatment for pregnant women as well as newborns, the issue of preterm delivery continues to pose serious dangers, including immediate health complications, along with survival rates (9, 10). The factors contributing to preterm birth are complex and precise mechanisms that result in preterm delivery remain inadequately understood (11, 12).

Preterm birth remains a leading cause of neonatal morbidity and mortality worldwide. Multiple gestations are strongly associated with an increased risk of preterm delivery due to factors such as uterine overdistension and maternal complications. Understanding the frequency of preterm birth in this group has become increasingly important. Assessing the frequency of preterm birth among multiple gestations will help identify the magnitude of the problem and inform clinical and public health interventions aimed at reducing adverse perinatal outcomes and improving neonatal survival rates.

Methodology

A cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Mardan Medical Complex, Mardan. Ethical approval was taken before starting the survey. Seventy-eight patients were selected for this study, based on the assumption of preterm birth in multiple gestation, 79.6%, (13) confidence level 95% and margin of error 9%. Patients were selected using a non-probability consecutive sampling technique.

Women aged 18 to 40 years who were confirmed to have a multiple gestation were enrolled. A multiple gestation was defined as the simultaneous development of more than one fetus within the uterus, diagnosed with ultrasound and supported by clinical signs such as fetal movements felt in various parts of the abdomen simultaneously, and excessive maternal weight gain. Women with renal disorders, diabetes, or hypertension and bleeding disorders were not included in the study.

After obtaining the consent from the patients, their demographic details were recorded. Preterm birth was evaluated in all patients, which was defined as the delivery of a neonate before 37 completed weeks of gestation, or before 259 days had passed since the first day of the patient's last menstrual period. A consultant supervised the entire evaluation process.

For data analysis, SPSS 27 was utilised. Preterm birth, mode of delivery, and all demographic details were summarized using frequencies and percentages. Age, gestational age, and BMI were described using mean and standard deviation. The chi-square test was used to assess the

association between preterm birth and demographic and clinical variables. P-value was considered significant if ≤ 0.05.

Results

This study included 78 women presenting with multiple gestations. The average maternal age was 28.67 ± 6.94 years (Table I). The analysis revealed that 32 women experienced a preterm birth (41.0%) (Table II). Analysis of factors associated with preterm birth indicated that educational status was strongly linked to the outcome. A large majority of women who delivered preterm were uneducated, 27 (84.4%) (P < 0.001). Preterm birth was not associated with other variables such as maternal age (P = 0.80), BMI (P = 0.50), socioeconomic status (P = 0.74), Place of living (P = 0.31), occupation status (P = 0.14), and mode of delivery (P = 0.60) (Table III).

Table 1: Demographic & clinical profile

Demographic & clinical profile		
Mean		SD
Age (Years)	28.67	6.94

BMI (Kg/m2)		22.72	1.26
Gestational age (Weeks)		33.33	1.77
n			**%**
Socioeconomic status	Lower class	28	35.9%
	Middle class	40	51.3%
	Upper class	10	12.8%
Place of living	Rural	41	52.6%
	Urban	37	47.4%
Education status	Educated	33	42.3%
	Uneducated	45	57.7%
Occupation status	Employed	16	20.5%
	Unemployed	62	79.5%
Mode of delivery	Vaginal	22	28.2%
	C-Section	56	71.8%

Table 2: Frequency of preterm birth

Preterm birth	n	%
Yes	32	41.0%
No	46	59.0%

Table 3: Association of preterm birth with demographic & clinical profile

Demographic & clinical profile		Preterm birth				P value
		Yes		No		
		n	%	n	%	
Age groups (Years)	18 to 30	19	59.4%	26	56.5%	0.80
	31 to 40	13	40.6%	20	43.5%	
BMI (Kg/m2)	18.5 to 24.9	31	96.9%	43	93.5%	0.50
	> 24.9	1	3.1%	3	6.5%	
Socioeconomic status	Lower class	12	37.5%	16	34.8%	0.74
	Middle class	17	53.1%	23	50.0%	
	Upper class	3	9.4%	7	15.2%	
Place of living	Rural	19	59.4%	22	47.8%	0.31
	Urban	13	40.6%	24	52.2%	
Education status	Educated	5	15.6%	28	60.9%	< 0.001
	Uneducated	27	84.4%	18	39.1%	
Occupation status	Employed	4	12.5%	12	26.1%	0.14
	Unemployed	28	87.5%	34	73.9%	
Mode of delivery	Vaginal	8	25.0%	14	30.4%	0.60
	C-Section	24	75.0%	32	69.6%	
Chi-Square test applied.						

Discussion

The observed preterm birth rate of 41.0% in this study aligns closely with the high-risk nature of twin pregnancies documented in studies. A study from Saudi Arabia found a premature labour rate of 42% in multiple pregnancies, which is almost similar to the current finding (14). Du et al. reported a 60.29% rate of preterm birth in their study (15). The frequency found in this study is also comparable to the 47% reported by Gashi et al. (16). Sumaira et al. found a preterm birth rate of 48% (17).

The demographic profile of the study cohort provides valuable information regarding multiple gestations. The mean maternal age was 28.67 years. This is consistent with the age range often associated with multiple gestations, which can be influenced by both natural conception and assisted reproductive technologies (ART). As noted by Brancazio et al., a shift towards childbearing later in life is one factor contributing to the increased incidence of multiple gestations (18).

The mean BMI of 22.72 kg/m² falls within the normal range, suggesting the study population had generally normal nutritional status prior to pregnancy. This is a relevant observation, as the study by Sumaira et al. identified maternal weight of 70 kg or less as a significant factor for preterm labour. However, a direct BMI comparison was not provided (18). Another study conducted in China noted that lower BMI increases

the risk of preterm birth (19). In contrast, BMI category was not a notable predictor of preterm birth in the present study.

Socioeconomic factors revealed that the majority of patients were from middle- and lower-class backgrounds, and more than half resided in rural areas. A high proportion of patients were uneducated (57.7%) and unemployed (79.5%). The analysis revealed that educational status was the sole demographic factor significantly associated with preterm birth. Around 84.4% of women who delivered preterm were uneducated, compared to 39.1% in the term delivery group. This finding aligns with research from China, where Du et al. also identified lower educational level as a significant risk factor for preterm birth in twin pregnancies. They reported a preterm birth rate of 73.1% in women with an associate degree or below, compared to 53.8% in those with a University education and above (15).

Regarding the mode of delivery, Caesarean section was the predominant method, performed in 71.8% of all deliveries. This high rate is typical in multiple gestations due to various obstetric indications. Kurdi et al. (2004) reported a similarly high Caesarean section rate of 49% in their multiple pregnancy cohort, with abnormal presentation and previous uterine scar being the leading indications (14). Similarly, another study reported that Caesarean section is more common in multiple gestations (20).

The clinical management of multiple pregnancies to prevent preterm birth remains a significant challenge in obstetrics. Several interventions have been studied. The use of progesterone supplementation, which is beneficial in singletons with a short cervix, has not demonstrated favorable efficacy in reducing preterm birth in unselected twin pregnancies. Similarly, strategies like routine bed rest or prophylactic tocolysis have not been shown to be effective and are not recommended (21). The most consistent predictive tool is transvaginal ultrasound measurement of cervical length, where a short cervix identified in the second trimester is a strong predictor of spontaneous preterm birth (21). This study has several limitations to consider. The small sample size of 78 patients may have limited the statistical power to detect weaker associations for some variables. The absence of data on chorionicity is a noteworthy limitation. Chorionicity is a significant factor in multiple gestation outcomes. Future research would be strengthened by a larger, multicentre approach that includes detailed ultrasound data, such as chorionicity and cervical length.

Conclusion

In conclusion, this study demonstrated a high frequency of preterm birth in multiple gestations (41%). The study showed that uneducated women were more likely to experience preterm birth.

Declarations
Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (IRB-529/BKMC)
Consent for publication
Approved
Funding
Not applicable

Conflict of interest

The authors declared no conflict of interest.

Author Contribution

SS (TMO)
Data Collection, Initial Manuscript Drafting, Data Analysis, Literature Review, and Contributed to the Interpretation of Results
NA (Professor)
Critical Input, Proofreading, and Final Revisions of the Manuscript

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the study's integrity.

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