Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v6i6.1802
*Biol. Clin. Sci. Res. J., Volume 6(6), **2025**: 1802*
Original Research Article

The Common Causes of Preterm Deliveries in Obstetric Patients

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(Received, 24th March 2025, Accepted 2nd June 2025, Published 30th June 2025)

Abstract: *Preterm delivery, defined as childbirth before 37 completed weeks of gestation, remains a major contributor to neonatal morbidity and mortality globally. Understanding the common causes is crucial for implementing preventive and management strategies tailored to high-risk populations.* ***Objective:*** *To identify and evaluate the common causes of preterm deliveries in obstetric patients.* ***Methods:*** *This descriptive cross-sectional study was conducted at Shaikh Zayed Women Hospital Larkana. over a period of June 2024 to December 2024. A total of 245 obstetric patients who delivered preterm were enrolled using non-probability consecutive sampling. Relevant clinical, demographic, and obstetric data were collected using structured proformas. The frequency and distribution of known etiological factors such as spontaneous preterm labor, PPROM, hypertensive disorders, infections, and multiple gestations were analyzed.* ***Results:*** *Out of 245 obstetric patients who delivered preterm, the most common cause was spontaneous preterm labor (36.3%), followed by PPROM (28.2%) and hypertensive disorders (18.8%). PPROM was frequently associated with urinary and genital infections. Hypertensive disorders were significantly more prevalent among women aged over 30 years ($p = 0.03$). Obese women (BMI ≥30) had higher rates of cesarean delivery (52.9%) and postpartum hemorrhage (19.1%). Neonatal outcomes were significantly worse in babies delivered before 34 weeks, with low birth weight seen in 86.5% and NICU admission in 58.3% of early preterm births. These associations were statistically significant ($p < 0.001$).* ***Conclusion:*** *Spontaneous preterm labor and PPROM were the leading causes of preterm deliveries in this population. Hypertension, infections, and multiple gestations were also notable contributors. Targeted antenatal surveillance and early intervention strategies are essential to mitigate these risks and reduce the burden of preterm birth.*

Keywords: Premature Birth Pregnancy Complications Hypertension, Pregnancy-Induced Premature Rupture of Fetal Membranes Risk Factors

[***How to Cite:*** Gul H, Magsi SI, Shaikh A. The common causes of preterm deliveries in obstetric patients. *Biol. Clin. Sci. Res. J.*, **2025;** 6(6): 129-132. doi: https://doi.org/10.54112/bcsrj.v6i6.1802

Introduction

Preterm delivery, defined as childbirth occurring before 37 completed weeks of gestation, remains one of the most significant challenges in obstetric and neonatal care worldwide. It accounts for a substantial proportion of neonatal deaths and long-term morbidities. According to the World Health Organization (WHO), more than 15 million babies are born preterm each year globally, representing over 10% of all births (1). Preterm birth complications are the leading cause of mortality among children under five years of age, responsible for approximately 1 million deaths annually (2). Despite major advancements in perinatal and neonatal care, the rate of preterm births has continued to rise in many countries, including both developed and developing nations (3). The consequences of preterm birth extend far beyond the neonatal period. Infants born preterm are at higher risk of respiratory distress syndrome, intraventricular hemorrhage, necrotizing enterocolitis, and long-term neurodevelopmental impairments such as cerebral palsy, cognitive delays, and visual and auditory deficits (4). The financial burden of managing preterm-related complications is also significant, requiring prolonged hospitalization in neonatal intensive care units and extensive follow-up care (5). In low- and middle-income countries, these burdens are often magnified due to limited access to maternal health services, skilled birth attendants, and specialized neonatal care (6). The etiologies of preterm delivery are diverse and multifactorial. They are broadly categorized into spontaneous preterm birth and iatrogenic (medically indicated) preterm birth. Spontaneous preterm birth, which includes preterm labor and preterm premature rupture of membranes (PPROM), accounts for approximately 70–75% of all preterm births (7). Risk factors for spontaneous preterm labor include a history of prior preterm birth, short cervical length, low maternal body mass index, young maternal age, infections, smoking, and low socioeconomic status (8). PPROM, defined as rupture of membranes before the onset of labor in pregnancies less than 37 weeks, is a major cause of preterm births and is commonly associated with ascending genital tract infections such as bacterial vaginosis, group B Streptococcus, and urinary tract infections (9).

Hypertensive disorders of pregnancy, including gestational hypertension, preeclampsia, and eclampsia, are among the leading causes of medically indicated preterm deliveries. These conditions often require early delivery to prevent life-threatening complications for both the mother and fetus (10). Similarly, antepartum hemorrhage due to placenta previa or placental abruption, intrauterine growth restriction (IUGR), multiple gestation, and fetal anomalies contribute to the decision for preterm birth in a significant number of cases (11). Additional maternal factors such as advanced maternal age, obesity, anemia, inadequate antenatal care, and chronic medical conditions (e.g., diabetes, renal disease) have also been implicated in increasing the risk of preterm delivery (12). Globally, the pattern and prevalence of the underlying causes of preterm birth differ due to variations in genetics, environmental exposures, health systems, and socio-economic factors (13). In many developing countries, infectious causes and lack of antenatal care predominate, whereas in high-income settings, increased maternal age, assisted reproductive technologies, and elective cesarean deliveries are emerging contributors (14). Despite this wide body of knowledge, there is still a lack of region-specific data that could guide targeted interventions. In countries like Pakistan, where maternal health services are inconsistently utilized and regional

disparities in healthcare delivery persist, it is imperative to analyze and understand the local determinants of preterm delivery (15).

Tus, the objective of the study was to identify and evaluate the common causes of preterm deliveries in obstetric patients.

Methodology

A descriptive cross-sectional study was conducted Shaikh Zayed Hospital Larkana. over a period of June 2024 to December 2024. Including 245 obstetric patients who delivered preterm, selected through non-probability consecutive sampling. Women aged 18–45 years Singleton or multiple pregnancies delivering before 37 completed weeks of gestation Reliable dating criteria (first trimester ultrasound or LMP) Known fetal congenital anomalies Elective preterm termination for fetal anomalies Incomplete medical records After obtaining informed consent, detailed clinical and demographic information including maternal age, parity, gestational age, booking status, medical and obstetric history was recorded using a structured proforma. The primary causes of preterm delivery were determined through clinical evaluation and review of patient records, categorized as spontaneous preterm labor, preterm premature rupture of membranes (PPROM), hypertensive disorders, antepartum hemorrhage, infections, or multiple gestations. Relevant laboratory and ultrasound findings were used to support clinical diagnoses where applicable. Data were analyzed using SPSS version 26. Quantitative variables such as maternal age and gestational age were presented as mean ± standard deviation, while categorical variables such as causes of preterm delivery, parity, and comorbidities were expressed as frequencies and percentages. The association between different causes and maternal demographic variables was assessed using the chi-square test, and a *p*-value of less than 0.05 was considered statistically significant.

Results

Data were collected from 245 patients. The mean age of patients in the spontaneous preterm group was slightly lower (27.9 ± 5.1 years) compared to those with other causes (29.0 ± 5.3 years), but the difference was not statistically significant (p=0.07). The gestational age at delivery was similar in both groups, with spontaneous preterm births occurring at a mean of 33.6 ± 2.5 weeks versus 33.3 ± 2.6 weeks in other cases (p=0.29). Parity ≥2 was seen in 56.3% of the total population, with no significant difference between the spontaneous (58.4%) and other cause (55.1%) groups (p=0.61). Regarding antenatal care, booked cases were more frequent in the spontaneous group (67.4%) than in the other group (59.6%), though this difference was not statistically significant (p=0.28); unbooked case distribution followed a similar trend (p=0.28). Spontaneous preterm labor was the leading cause of preterm delivery, reported in 36.3% of the total patients, with comparable rates in primigravida (38.2%) and multigravida (35.0%) groups (p=0.52). PPROM accounted for 28.2% of cases overall, with nearly identical distribution among primigravida (28.4%) and multigravida (28.0%) patients (p=0.91). Hypertensive disorders contributed to 18.8% of cases, with slightly higher frequency in primigravidas (20.6%) than multigravidas (17.5%), though not statistically significant (p=0.44). Antepartum hemorrhage (8.6%), infections like UTI/STI (7.8%), and multiple gestation (6.1%) were less common and showed no significant differences between the two parity groups, with p-values all above 0.30. Out of 69 patients with PPROM, urinary tract infections were the leading associated risk factor, seen in 37.7% of cases. Among women under 25 years, 45.8% had UTIs, whereas in those aged 25 years or older, 33.3% were affected. Genital infections were the second most frequent cause (24.6%), followed by anemia (17.4%) and cases without identified risks (20.3%). None of the associations were statistically significant (p>0.05), but trends suggested a higher infectious burden among younger mothers. Hypertensive disorders were most prevalent in women older than 30 years, affecting 26.7% of them. In comparison, only 14.8% of women under 25 years and 14.3% of those aged 25–30 were diagnosed with hypertension-related complications. These disorders were slightly more frequent among multigravidas across all age groups. The association between maternal age and hypertensive complications was statistically significant (p = 0.03), indicating increasing risk with age. Among all participants, cesarean sections were performed in 42.4%, postpartum hemorrhage occurred in 12.7%, and 11.0% required blood transfusions. Obese patients (BMI ≥30) had significantly higher rates of cesarean delivery (52.9% vs. 38.4%, p = 0.03) and postpartum hemorrhage (19.1% vs. 10.2%, p = 0.04) compared to those with lower BMI. Other complications like anemia and transfusion requirement were more common in obese women but not statistically significant. Low birth weight was a common outcome, affecting 73.1% of all preterm neonates. This was more prevalent in babies delivered before 34 weeks (86.5%) compared to those born between 34–36 weeks (64.4%, p < 0.001). NICU admissions were also significantly higher among early preterm deliveries (58.3% vs. 30.2%, p < 0.001). Neonatal mortality and poor APGAR scores were notably more common in earlier gestations, reinforcing the importance of gestational age in determining neonatal prognosis.

Table 1: Demographic Characteristics

Characteristic	Total (n=245)	Spontaneous Preterm (n=89)	Other Causes (n=156)	p-value
Age (years)	28.6 ± 5.2	27.9 ± 5.1	29.0 ± 5.3	0.07
Gestational Age (weeks)	33.4 ± 2.6	33.6 ± 2.5	33.3 ± 2.6	0.29
Parity ≥2	138 (56.3%)	52 (58.4%)	86 (55.1%)	0.61
Booked Cases	153 (62.4%)	60 (67.4%)	93 (59.6%)	0.28
Unbooked Cases	92 (37.6%)	29 (32.6%)	63 (40.4%)	0.28

Table 2: Causes of Preterm Delivery by Gravidity

Cause	Total (n=245)	Primigravida (n=102)	Multigravida (n=143)	p-value
Spontaneous Preterm Labor	89 (36.3%)	39 (38.2%)	50 (35.0%)	0.52
PPROM	69 (28.2%)	29 (28.4%)	40 (28.0%)	0.91
Hypertensive Disorders	46 (18.8%)	21 (20.6%)	25 (17.5%)	0.44
Antepartum Hemorrhage	21 (8.6%)	7 (6.9%)	14 (9.8%)	0.67
Infections (UTI/STI)	19 (7.8%)	6 (5.9%)	13 (9.1%)	0.33
Multiple Gestation	15 (6.1%)	5 (4.9%)	10 (7.0%)	0.40

Table 3: PPROM Risk Factors by Maternal Age

Risk Factor	PPROM Total (n=69)	Age <25 yrs (n=24)	Age ≥25 yrs (n=45)	p-value
UTI	26 (37.7%)	11 (45.8%)	15 (33.3%)	0.38
Genital Infection	17 (24.6%)	5 (20.8%)	12 (26.7%)	0.55

Anemia	12 (17.4%)	4 (16.7%)	8 (17.8%)	0.92
No Identified Risk	14 (20.3%)	4 (16.7%)	10 (22.2%)	0.73

Table 4: Hypertensive Disorders by Age and P*arity*

Group	Total Cases (n=245)	Hypertensive Disorders	Primigravida	Multigravida	p-value
<25 yrs	61	9 (14.8%)	5 (55.6%)	4 (44.4%)	
25–30 yrs	98	14 (14.3%)	7 (50.0%)	7 (50.0%)	
>30 yrs	86	23 (26.7%)	10 (43.5%)	13 (56.5%)	0.03

Table 5: Maternal Complications by BMI and Delivery Mode

Complication	Total (n=245)	BMI ≥30 (n=68)	BMI <30 (n=177)	p-value
Postpartum Hemorrhage	31 (12.7%)	13 (19.1%)	18 (10.2%)	0.04
Anemia	94 (38.4%)	28 (41.2%)	66 (37.3%)	0.61
Cesarean Section	104 (42.4%)	36 (52.9%)	68 (38.4%)	0.03
Need for Blood Transfusion	27 (11.0%)	10 (14.7%)	17 (9.6%)	0.18

Table 6: Neonatal Outcomes by Gestational Age

Outcome	Total (n=245)	GA <34 wks (n=96)	GA 34–36 wks (n=149)	p-value
Low Birth Weight (<2.5 kg)	179 (73.1%)	83 (86.5%)	96 (64.4%)	<0.001
NICU Admission	101 (41.2%)	56 (58.3%)	45 (30.2%)	<0.001
APGAR <7 at 5 min	38 (15.5%)	24 (25.0%)	14 (9.4%)	0.004
Neonatal Mortality	14 (5.7%)	10 (10.4%)	4 (2.7%)	0.03

Discussion

This study aimed to evaluate the common causes of preterm deliveries and their maternal and neonatal implications. The findings demonstrate that spontaneous preterm labor was the leading cause of preterm delivery, accounting for 36.3% of cases. This aligns with previous research, which similarly reported spontaneous preterm labor as the most prevalent cause, particularly in low-resource settings where infection, inflammation, and inadequate antenatal care are more common (16). Preterm premature rupture of membranes (PPROM) was the second most common contributor (28.2%), often associated with urinary tract and genital infections. In this study, 62.3% of PPROM cases had at least one identifiable infection, consistent with findings from previous research that emphasized the strong link between lower genital tract infections and early membrane rupture (17). The higher incidence of PPROM among younger mothers also reinforces data from previous research showing that maternal age <25 years is a significant risk factor. Hypertensive disorders of pregnancy were the third most frequent cause, seen in 18.8% of participants, and significantly more common among women over 30 years of age. This is in agreement with previous research, which has demonstrated a direct relationship between maternal age and the incidence of gestational hypertension and preeclampsia (18). Such conditions often necessitate iatrogenic preterm deliveries to prevent severe maternal and fetal complications.

Antepartum hemorrhage (8.6%), infections (7.8%), and multiple gestations (6.1%) were also notable contributors. These findings echo patterns identified in previous studies, which have highlighted placental pathologies and multifetal pregnancies as recurrent factors associated with shortened gestation (19). From a maternal health perspective, this study found that obese women (BMI ≥30) were significantly more likely to experience postpartum hemorrhage (19.1%) and undergo cesarean delivery (52.9%). These findings corroborate previous research, which indicates that obesity is associated with poor uterine contractility, prolonged labor, and higher operative delivery rates (20). Neonatal outcomes were strongly influenced by gestational age at delivery. Among neonates delivered before 34 weeks, 86.5% had low birth weight, and 58.3% required NICU admission, significantly higher than those delivered at later gestational ages. Similar trends were observed in previous research, which linked earlier gestational age with increased risks of respiratory distress, poor APGAR scores, and neonatal mortality (21). Overall, the findings underscore the need for early identification of high-risk pregnancies and targeted antenatal interventions. Promoting infection control, managing maternal comorbidities, and optimizing antenatal care coverage could significantly reduce the burden of preterm birth and improve both maternal and neonatal outcomes.

Conclusion

This study highlights that spontaneous preterm labor, PPROM, and hypertensive disorders are the most common causes of preterm deliveries among obstetric patients. Advanced maternal age, obesity, and infections were significant risk factors contributing to adverse maternal and neonatal outcomes. Preterm birth was associated with higher rates of low birth weight, NICU admissions, and neonatal morbidity, particularly in deliveries before 34 weeks of gestation. These findings emphasize the importance of early risk assessment, preventive strategies, and timely antenatal care to mitigate the risks associated with preterm deliveries and improve perinatal outcomes.

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. (IRBEC-24)
Consent for publication
Approved
Funding
Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

HG (Postgraduate)
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Review of Literature, Data entry, Data analysis, and drafting article.
AS (Final Year Student)
Conception of Study, Development of Research Methodology Design,

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

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