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Research Article

Maternal and Fetal Risk Factors for Preterm Birth: Insights from a Retrospective Study at HMS Mirdif Hospital, Dubai

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Abstract

Prematurity remains a significant contributor to neonatal morbidity and mortality worldwide. This study aims to analyze the prevalence of preterm births at HMS Mirdif Hospital, Dubai, and identify maternal and fetal risk factors contributing to these cases. A retrospective case-control study was conducted on 654 neonates admitted to the NICU between January 2022 and December 2024, comparing 217 preterm infants (< 37 weeks gestation) with 437 term infants (≥ 37 weeks gestation). The study assessed short-term and long-term complications, maternal risk factors, and neonatal management strategies. Findings from this study will aid in developing targeted interventions to improve neonatal outcomes. Our findings identify several significant maternal and fetal risk factors. The management protocols implemented at HMS Mirdif Hospital demonstrated promising outcomes, comparable to international benchmarks.

Keywords: *Prematurity; Preterm Birth; Neonatal Outcomes; Maternal Risk Factors; Fetal Risk Factors; Epidemiology; Retrospective Case-Control Study; Neonatal Intensive Care Unit (NICU); Bronchopulmonary Dysplasia (BPD); Retinopathy of Prematurity (ROP); Gestational Age; Premature Rupture of Membranes (PRROM); Neonatal Morbidity and Mortality; Multiple Pregnancies; Maternal Diabetes; Maternal Hypertension; Antenatal Care; Low Birth Weight; Respiratory Distress Syndrome (RDS); United Arab Emirates (UAE) Neonatal Health*

Definitions:

- Term birth: Birth occurring at or after 37 completed weeks of gestation.
- Preterm birth: Birth occurring before 37 completed weeks of gestation.
- Extremely preterm (less than 28 weeks).
- Very preterm (28 to less than 32 weeks).
- Moderate to late preterm (32 to less than 37 weeks).
- Maternal age: The mother's age at the time of delivery, expressed in years.
- Parity: The number of previous pregnancies a woman has carried to viability (beyond 20-24 weeks gestation, according to the definitions of viability). This includes live births and stillbirths.
- Maternal BMI (Body mass index): A measure of body fat based on height and weight, calculated as weight (kg)/height (m)^2.

- Multiple gestation: Pregnancy with more than one fetus (e.g. twins, triplets).
- Maternal infection: Any documented infection in the mother during pregnancy, including but not limited to urinary tract infections, chorioamnionitis, or other systemic infections that required medical advice and medications.
- Premature labor pains: Uterine contractions occurring before 37 weeks of gestation accompanied by cervical changes (dilation or effacement).
- Previous tender scar: Likely refers to a previous cesarean section, which can be a risk factor for subsequent pregnancy complications.
- Oligohydramnios: A condition characterized by abnormally low levels of amniotic fluid surrounding the fetus. Diagnostic criteria usually involve ultrasound measurements of amniotic fluid volume or index.
- Premature rupture of membranes (PROM): Rupture of the amniotic membranes (bag of waters) before the onset of labor and before 37 weeks of gestation.
- Placenta previa: A condition in which the placenta partially or completely covers the cervical opening.
- Antepartum hemorrhage: Bleeding from the genital tract during pregnancy, occurring after 24 weeks of gestation but before the onset of labor.
- Need for invasive mechanical ventilation (MV): The use of an invasive mechanical ventilator to support breathing in the newborn with placement of endotracheal tube.
- Bronchopulmonary dysplasia (BPD): BPD is a chronic lung disease affecting premature infants.
- Jensen definition classified BPD severity in infants at 36 weeks PMA into: grade 1 if require 2 L/min nasal cannula or less, grade 2 if require more than 2 L/min nasal cannula or other forms of non-invasive ventilation support, and grade 3 if require invasive mechanical ventilation [1]. In the current study we considered severe BPD as grade 2 and 3.
- Severe retinopathy of prematurity (ROP): ROP is a potentially blinding eye condition that affects premature infants. Typically refers to Stage 3 ROP or worse, or any ROP requiring treatment (laser therapy or intravitreal injections) according to The International Classification of Retinopathy of Prematurity (ICROP) grading system is the standard [2].
- Intravitreal injection: Injection of medication (usually an anti-VEGF agent) directly into the vitreous humor (gel-like substance) of the eye to treat severe ROP.
- Intraventricular hemorrhage (IVH): Bleeding into the brain's ventricles, common in premature infants. We considered severe IVH as grade III and IV as per Papile classification [3]:
- Grade I IVH: Bleeding confined to the germinal matrix.
- Grade II IVH: Bleeding extending into the ventricles but without ventricular dilation.
- Grade III IVH: Bleeding filling the ventricles with ventricular dilation.
- Grade IV IVH: Bleeding into the brain parenchyma (brain tissue) surrounding the ventricles.
- Necrotizing enterocolitis (NEC): A serious intestinal condition that can affect premature infants, characterized by inflammation and damage to the intestinal wall.
- Hospital stay: The total number of days a newborn spends in the hospital after birth.
- Outcome (Neonatal): Refers to the infant's condition at discharge from the hospital, categorized as "alive" or "deceased".

Introduction

Preterm birth, defined as delivery occurring before 37 weeks of gestation, is a significant global health concern that can lead to various complications for both the infant and the mother. According to the World Health Organization, preterm birth accounts for approximately 15 million births each year, contributing to the leading cause of neonatal mortality [1]. Understanding the prevalence of preterm births and the associated risk factors is crucial for improving maternal and neonatal care.

Several risk factors contribute to the likelihood of preterm birth. Maternal age plays a vital role, with both very young (under 17) and older women (over 35) at increased risk [2]. Medical conditions such as hypertension, diabetes, and infections can also elevate the chances of early delivery [3]. Lifestyle factors, including smoking, substance abuse, and inadequate prenatal care, further exacerbate the risk [4]. Additionally, psychosocial factors such as high levels of stress, lack of social support, and a history of preterm births can influence the likelihood of premature delivery [5].

Aim of the Study

The present study is aimed to investigate the predisposing factors (maternal and neonatal risk factors) in the incidence of prematurity in newborn infants admitted HMS Mirdif Hospital, Dubai, UAE. Identifying predisposing factors in predicting the occurrence and prevention of such risks in neonates is important to reduce the morbidity and mortality related to prematurity.

Methodology

Research method and design

This is an epidemiological retrospective case-control study conducted at HMS Mirdif Hospital, Dubai, UAE. The study population includes all neonates born at the hospital between January 2022 and December 2024.

Research aim

The study aims to determine the prevalence of prematurity at HMS Mirdif Hospital and identify significant maternal and fetal risk factors contributing to preterm births.

Study design

A retrospective case-control study was conducted.

Patient selection

- **Inclusion criteria**: Neonates born at HMS Mirdif Hospital and admitted to the NICU with a gestational age of less than 37 weeks.
- **Control group**: Neonates born at HMS Mirdif Hospital and admitted to the NICU at 37 weeks or later.

Data collection

Data were collected from the hospital's computerized registers database. The following variables were recorded:

- **Maternal factors**: Age, parity, BMI, blood group, diabetes, hypertension, urinary tract infections (UTI), infections, incompetent cervix, premature labor pains, previous tender scar, polyhydramnios, oligohydramnios, premature rupture of membranes (PROM), placenta previa, and antepartum hemorrhage.
- **Fetal factors**: Blood group, need for invasive mechanical ventilation (MV) and necrotizing enterocolitis (NEC).

- **Management and outcomes**: Final outcome (alive or deceased), duration of NICU length of stay, long term complications including bronchopulmonary dysplasia (BPD), intraventricular hemorrhage (IVH), and retinopathy of prematurity (ROP).
- **Subgroup data analysis:** The study included a subgroup analysis of the preterm population (study group) to assess survival rate, clinical outcomes, and length of hospital stay. This analysis aimed to provide a comprehensive evaluation of neonatal prognosis by examining key morbidity indicators and overall survival trends. The findings from this subgroup analysis offer valuable insights into the factors influencing neonatal health and the effectiveness of current management strategies.

Statistical analysis

Descriptive statistics summarized demographic and clinical characteristics. Logistic regression analysis identified significant risk factors for preterm births. Chi-square tests and Student t-tests were used to compare categorical and continuous variables, respectively.

Results

The collected data were tabulated and analyzed by SPSS (statistical package for the social science software) statistical package version 26 on IBM compatible computer (SPSS Inc. Released 2018. IBM SPSS statistics for windows, version 26.0, Armnok, NY: IBM Corp.).

Two types of statistics were conducted

1. **Descriptive statistics:** Data were expressed in number and percentage (No & %) for qualitative data, mean, standard deviation (SD) for quantitative normally distributed data and median and interquartile range (IQR) and range (Minimum- Maximum) for quantitative not normally distributed data (Snecdecor GW, Cochran WG. Statistical Methods: Wiley; 1991. 14-29 p).

2. **Analytical statistics**

- Student's t-test (t) is a test of significance used for comparison of quantitative variables between two groups of normally distributed data, while Mann-Whitney's test (U) was used for comparison of quantitative variables between two groups of not normally distributed data (Hollander M, Wolfe DA, Chicken E. Nonparametric statistical methods. John Wiley & Sons; 2013 Nov 25).

- Chi-square test (χ^2) was used to study association between qualitative variables. was used. Fisher's exact test for 2 x 2 tables when an expected cell counts of more than 25% of cases was less than 5 (Powers D, Xie Y. Statistical methods for categorical data analysis. Emerald Group Publishing; 2008 Nov 13).

- One way ANOVA is a test of significance used for comparison of quantitative variables between more than two groups of normally distributed data, while Kruskal-Wallis H is a test of significance used for comparison of quantitative variables between more than two groups of not normally distributed data.

- **Sensitivity:** It is the percentage of patients who are giving positive results with the test. Sensitivity = TP x100/ TP+FN. It represents the capacity of the test to correctly identify diseased individuals in a population-True Positives (Altman DG, Bland JM (June 1994). "Diagnostic tests. 1: Sensitivity and specificity". BMJ. 308 (6943): 1552).

- **Specificity:** It is the percentage of healthy individuals who are giving negative results with the test. Specificity=TN x100/ TN+FP. It represents the capacity of the test to exclude individuals who are free of the disease –True Negatives (Altman DG, Bland JM (June 1994). "Diagnostic tests. 1: Sensitivity and specificity". BMJ. 308 (6943): 1552).

- **Diagnostic Accuracy:** It is the percent of individuals correctly identified by the test as TN or TP. Diagnostic Accuracy = [(TP+ TN) / Total tested] x 100 (Zhou, X. H., Obuchowski, N. A., & McClish, D. K. (2011). Statistical methods in diagnostic medicine. Wiley-Blackwell).

- **Positive predictive value (PPV):** is the proportion of patients with positive tests who have disease (Fletcher, Robert H. Fletcher; Suzanne W. (2005). Clinical epidemiology: the essentials (4th edition). Baltimore, Md.: Lippincott Williams & Wilkins. pp. 45).
- **Negative predictive value (NPV):** is the proportion of patients with negative tests who do not have disease (Fletcher, Robert H. Fletcher; Suzanne W. (2005). Clinical epidemiology: the essentials (4th edition). Baltimore, Md.: Lippincott Williams & Wilkins. pp. 45).
- P value < 0.05 was set to be statistically significant.

During the study period, there were 3,725 live births, of which 654 (17.6%) were admitted to the NICU. Among these 654 newborns, 217 (33.2%) were preterm, while 437 (66.8%) were full-term. The incidence of preterm births represents 5.8% (Table 1).

Prematurity	Number	Percent
Yes	217	33.2
No	437	66.8

Table 1: *Prevalence of prematurity (total cases = 654).*

Several maternal factors were significantly associated with preterm birth (Table 2). These included maternal age (p = 0.048), gestational age at delivery (p < 0.001), parity (p = 0.020), multiple gestation (p < 0.001), maternal infection (p = 0.009), premature labor pains (p < 0.001), previous tender scar (p < 0.001), oligohydramnios (p=0.008), and PROM (p < 0.001). Maternal BMI, Hypertension (HTN), maternal Diabetes (DM), antepartum hemorrhage, urinary tract infection, maternal, fetal blood groups, polyhydramnios, placenta previa and incompetent cervix were not statistically significant in this study.

Variable	Premature No.=217	Mature No.=437	Test of significance	P value
Mean Maternal Age	30.8	29.94	t=1.98	0.048*
Mean Gestational Age	33.9	39.37	t=5.166	<0.001**
Multi parity	140 (64.5)	245 (56.1)	χ^2	0.039*
			4.278	
Twin pregnancy	30 (13.8)	4 (0.9)	χ^2	<0.001*
			49.031	
Maternal DM	35 (16.2)	48 (11)	χ^2	0.066
			3.385	
Maternal HTN	12 (5.5)	12 (2.7)	χ^2	0.063
			3.464	
Maternal UTI	5 (2.3)	11 (2.5)	χ^2	0.858
			0.028	
Maternal infection	15 (6.9)	60 (13.7)	χ^2	0.01*
			6.638	
In competent cervix	3 (1.4)	1 (0.2)	χ^2	0.075
			3.175	
Premature labour pains	32 (14.7)	4 (0.9)	χ^2	<0.001*
			56.589	

Previous tender scar	13 (6.0)	4 (0.9)	χ^2	<0.001*
			14.753	
Polyhydramnios	2 (0.9)	4 (0.9)	FE= 0	1
Oligohydramnios	5 (2.3)	1 (0.2)	χ^2	0.009*
			6.87	
PRROM	34 (15.7)	9 (2.1)	χ^2	<0.001*
			44.716	
Placenta Previa	0 (0.0)	1 (0.2)	FE=0.497	0.481
Antepartum hemorrhage	3 (1.4)	1 (0.2)	FE=3.175	0.109

Table 2: *Maternal risk factors of prematurity.*

*χ^2: Chi square test, *= statistically significant, FE= fissure Exact, t= Student t test.*

Table 3 and 4 show fetal risk factors, hospital stay and outcome including need for invasive mechanical ventilation ($p < 0.001$) and severe BPD ($p = 0.036$) were significantly associated with prematurity. NEC, IVH, and ROP were not significantly associated. Premature infants had a significantly longer hospital stay ($p = 0.048$). While the mortality rate was higher in preterm infants (3.2%) compared to term infants (1.4%), this difference was not statistically significant ($p = 0.110$). Survival rates among preterm and term babies were 96.8% and 98.6% respectively.

Variable	Premature No. = 217	Mature No. = 437	Test of significance	P value
MV need	63 (29.0)	44 (10.1)	χ^2	<0.001*
			38.106	
NEC	1 (0.5)	0 (0.0)	FE=2.017	0.156
BPD	3 (1.4)	0 (0.0)	FE=6.069	0.036*
IVH	2 (0.9)	0 (0.0)	FE=4.04	0.110
ROP	4 (1.8)	4 (0.9)	FE=1.033	0.450

Table 3: *Fetal risk factors of prematurity and outcome.*

*χ^2: Chi square test, *= statistically significant, FE= fissure Exact.*

Variable	Premature No.=217	Mature No.=437	Test of significance	P value
Mean Hospital stay	7.96	2.94	U=6.928	<0.001*
Deceased	7 (3.2)	6 (1.4)	2.555	0.110

Table 4: *Hospital stay and outcome.*

*χ^2: Chi square test, *= statistically significant, U=Mann-Whitney.*

Subgroup analysis of the preterm group is presented in figure 1, table 5 and 6, showing a prevalence of 86% for premature babies born between 32 and 37 weeks of gestation, 9% between 28 and less than 32 weeks, and 5% under 28 weeks.

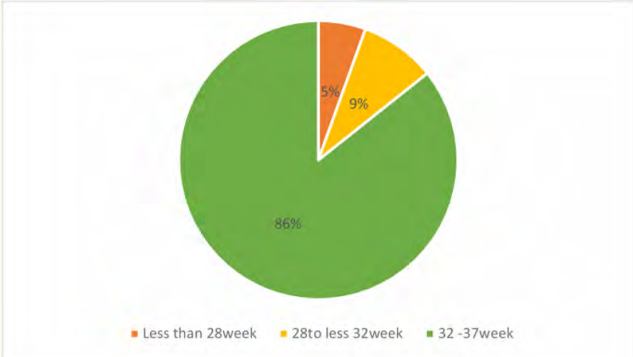

Figure 1: *Distribution of the preterm group by gestational age.*

	Less than 28 weeks No.=12	28-32-weeks No.=19	32-37 weeks No.=186	Test of significance	P value
Outcome deceased	3 (25.0)	0 (0.0)	4 (2.2)	19.547	<0.001**
BPD	3 (25.0)	0 (0.0)	0 (0.0)	51.968	<0.001**
IVH	0 (0.0)	0 (0.0)	2 (1.1)	0.336	0.845
NEC	1 (8.3)	0 (0.0)	0 (0.0)	17.162	<0.001**

Table 5: *Subgroup analysis of the outcome of preterm group.*

*χ^2: Chi square test, *= Statistically Significant.*

Gestational age	Birth weight	Hospital stays
	Mean	Mean
Less than 28 weeks	0.589	35.33
28-32 week	1.57	13.53
32 -37 week	2.48	3.95
Test of significance	47.834	69.004
P value	<0.001**	<0.001**

Table 6: *Subgroup analysis of the birthweight and hospital stay of the preterm group.*

**= Statistically significant.*

Discussion

Annually, approximately 13.4 million newborns are born prematurely, representing around 1 in 10 of all live births. Alarmingly, nearly one million of these preterm infants succumb to complications each year [6,7]. Globally, preterm birth rates vary significantly, ranging from 4% to 16% across different countries [8,9].

At HMS Mirdif Hospital, the prevalence of preterm births was recorded at 5.8%, which is lower than the global average of 10% reported by the World Health Organization (WHO). This variance may be attributed to factors such as population demographics, regional risk factors, and sample size. Notably, our findings align closely with those of Zainab., *et al.* who reported a preterm birth prevalence of 6.3% in a study conducted in Abu Dhabi, UAE, in 2020 [10].

The study identified several significant maternal risk factors for preterm birth, including advanced maternal age, primiparity, multiple pregnancies, maternal infections, premature labor pains, previous tender scar, oligohydramnios, and PROM. These findings are consistent with international studies. For instance, a study by Goldenberg., *et al.* (2008) found that maternal infections and multiple pregnancies are significant risk factors for preterm birth [11]. Similarly, a study by Blencowe., *et al.* (2012) highlighted the role of maternal age and parity in preterm births [12].

In contrast to our findings, Santos., *et al*. identified a significant correlation between maternal BMI and prematurity. However, both studies demonstrated a significant association with oligohydramnios [13].

Our study found that maternal and fetal blood groups, hypertension (HTN), antepartum hemorrhage, urinary tract infections, polyhydramnios, placenta previa, and incompetent cervix were not statistically significant risk factors. However, these factors have been reported as significant in other studies. This discrepancy may be attributed to differences in sample size, population demographics, study design, or variations in regional and environmental risk factors.

The need for invasive mechanical ventilation was significantly higher in preterm infants, reflecting the immaturity of their respiratory systems. However, the incidence of severe complications such as BPD, ROP, NEC, IVH, and ROP was low, indicating effective management strategies in the NICU.

The survival rate in our study was 96.8%, demonstrating a favorable outcome compared to other published studies. In contrast, previous population-based studies have reported survival rates ranging from 79% to 95% [14]. The NICHD Neonatal Research Network reported a survival rate of approximately 70% for extremely preterm infants [15,16]. This higher survival rate may be attributed to advancements in neonatal care, improved perinatal management, and early intervention strategies.

The incidence of bronchopulmonary dysplasia (BPD) in our study was 1.4%, which is considerably lower than the rates reported in the literature. Studies have documented BPD prevalence ranging from 11.2% to 23.7% [17,18]. The NICHD study reported BPD rates of approximately 40% in extremely preterm infants [15].

This significant variation may be due to differences in respiratory management, ventilation strategies, and neonatal intensive care practices.

Intraventricular hemorrhage (IVH) was observed in 0.9% of our cohort, which is markedly lower than the 4.6% to 5.4% reported in previous studies [19]. The NICHD study reported severe IVH in approximately 16% of extremely preterm infants [15]. The reduced incidence in our population suggests the effectiveness of antenatal steroid administration, optimized perinatal care, and advanced neuroprotective strategies.

Retinopathy of prematurity (ROP) was diagnosed in 1.9% of infants, a notably lower prevalence compared to reported rates ranging from 2.6% to 11.1% [20]. The NICHD study documented severe ROP in about 13% of extremely preterm infants [15]. This lower incidence highlights the impact of stringent oxygen management protocols, early screening programs, and prompt interventions in reducing the risk of severe ROP.

The occurrence of necrotizing enterocolitis (NEC) in our study was 0.5%, significantly lower than the reported rates of 4.0% to 9.1% in other studies [21]. The NICHD study reported NEC in approximately 7% of extremely preterm infants [15]. The reduced incidence of NEC may reflect differences in enteral feeding protocols, early use of human milk, and strict infection control measures.

Overall, our study demonstrates superior neonatal outcomes, with a higher survival rate and lower morbidity compared to previously published data. These variations underscore the potential impact of region-specific neonatal care protocols, advancements in perinatal medicine, and targeted interventions. Future research should further investigate the factors contributing to these improved outcomes to guide global neonatal care strategies.

The prevalence of prematurity in this study indicates that the majority of preterm births occurred between 32 and 37 weeks of gestation (85.7%), followed by 8.8% in the 28-32-week range, and 5.5% in those born before 28 weeks. These findings align with global trends, where late preterm births (32-37 weeks) constitute the largest proportion of preterm deliveries. According to the World Health Organization (WHO), approximately 10% of all live births are preterm, with the majority falling into the late preterm category. The distribution of preterm births in our study is comparable to international data, suggesting similar risk factors and perinatal care practices.

Examining the subgroup outcomes of preterm infants, survival rates were highest in the 28-32-week and 32-37-week groups, with 100% survival reported in the former and 98% in the latter. However, survival among those born before 28 weeks was lower (75%), with a mortality rate of 25%. This finding is in line with the survival rates for infants born between 24 and 27 weeks of gestation in many studies. A meta-analysis published in *Pediatrics* reported that survival rates increased from approximately 7.3% at 22 weeks to 90.1% at 27 weeks among live births [22]. Another study found that survival rates were 31.2% at 24 weeks, 59.1% at 25 weeks, 75.3% at 26 weeks, and 93.6% at 27 weeks [23]. These findings suggest that survival rates for infants born between 24 and 27 weeks generally range from around 60% to over 90%, depending on the specific gestational age and the level of medical care available.

Bronchopulmonary dysplasia (BPD) was observed exclusively in the less than 28-week group (25%), with no reported cases in infants beyond 28 weeks. This is consistent with international data, where BPD is primarily seen in extremely premature infants due to prolonged mechanical ventilation and oxygen therapy. Intraventricular hemorrhage (IVH) was rare in our cohort, with only two cases (1.1%) in the 32- 37-week group, and no cases reported in the other subgroups. The absence of IVH in extremely preterm infants' contrasts with global reports, where IVH is more common in those born before 28 weeks. This discrepancy may be due to sample size limitations or effective neuroprotective strategies in our study population.

NEC occurred in 8.3% of infants born before 28 weeks, while no cases were recorded in the other groups. This aligns with international data showing that NEC primarily affects extremely preterm infants due to immature gut function and inflammatory responses. A statistically significant difference was observed in NEC prevalence across gestational age groups ($p < 0.001$), emphasizing the vulnerability of extremely preterm neonates.

Birth weight and hospital stay varied significantly among gestational age groups. Infants born before 28 weeks had the lowest mean birth weight (0.589 ± 0.16 kg) and the longest hospital stay (35.33 ± 41.39 days). Those born between 28 and 32 weeks had a mean birth weight of 1.57 ± 0.23 kg and stayed an average of 13.53 ± 16.34 days, while late preterm infants (32-37 weeks) had a mean birth weight of 2.48 ± 0.59 kg and the shortest hospital stay (3.95 ± 4.53 days). These findings align with international studies that consistently report a direct correlation between lower birth weight, earlier gestational age, and prolonged hospitalization. The statistical significance of these differences ($p < 0.001$) highlights the increased medical needs of extremely preterm infants.

When compared to international benchmarks, our study's survival rates for preterm infants are comparable to those reported in high-resource settings. Studies from North America and Europe have reported survival rates of 80-90% for infants born at 24-28 weeks, with significant improvements over the past decade due to advances in neonatal care. However, in low- and middle-income countries, survival

rates for extremely preterm infants remain significantly lower due to limited access to advanced respiratory support and neonatal intensive care.

Our findings also underscore the burden of BPD and NEC among the most vulnerable preterm groups. International studies have shown that the incidence of BPD ranges from 20-40% in extremely preterm infants, similar to our observed rate of 25% in the <28-week group. The observed NEC prevalence of 8.3% in extremely preterm infants also aligns with global reports, where NEC affects 5-10% of neonates born before 28 weeks.

Overall, our study provides valuable insights into the prevalence and outcomes of prematurity. While our results align with global trends, continued efforts to optimize neonatal care, including early intervention strategies, antenatal corticosteroids, and postnatal respiratory support, are crucial in improving survival and reducing complications among extremely preterm infants.

Conclusion

This study provides critical insights into the prevalence, maternal risk factors, and neonatal outcomes associated with preterm births at HMS Mirdif Hospital. The preterm birth rate of 5.8% observed in this study is lower than the global average, which may be attributed to region-specific factors, population demographics, and medical care standards. Our findings align with existing literature regarding major maternal risk factors, including advanced maternal age, multiple pregnancies, maternal infections, and premature labor pains. However, factors such as maternal and fetal blood groups, hypertension, and placenta previa were not found to be statistically significant in our study, contrary to some international findings.

Neonatal outcomes were largely favorable, with a high overall survival rate of 96.8%, surpassing many previously reported figures. The low incidence of severe complications, including bronchopulmonary dysplasia (BPD), intraventricular hemorrhage (IVH), retinopathy of prematurity (ROP), and necrotizing enterocolitis (NEC), highlights the effectiveness of current neonatal management strategies. The study further underscores the vulnerability of extremely preterm infants (<28 weeks), who exhibited higher morbidity and mortality rates, reinforcing the need for targeted perinatal interventions.

Study Limitations

1. Single-center design: The study was conducted at a single hospital, which may limit the generalizability of the findings to other regions or healthcare settings.
2. Sample size constraints: A larger sample size could provide a more comprehensive understanding of preterm birth risk factors and outcomes.
3. Retrospective nature: The study relied on retrospective data, which may be subject to biases such as incomplete records and potential misclassification of risk factors.
4. Lack of long-term follow-up: The study focused on immediate neonatal outcomes without assessing long-term developmental and health consequences of preterm births.
5. Unmeasured confounders: Certain environmental, genetic, or socio-economic factors that could contribute to preterm birth were not extensively analyzed.

Recommendations

1. Enhanced antenatal care: Strengthening antenatal screening programs to identify high-risk pregnancies early and implementing targeted interventions, such as maternal corticosteroid therapy, to improve neonatal outcomes.

2. Optimized neonatal management: Continuing advancements in neonatal intensive care unit (NICU) protocols, including non-invasive ventilation strategies, stringent oxygen management, and neuroprotective interventions, to further reduce morbidity among preterm infants.
3. Research and data collection: Conducting larger multicenter studies to validate findings and explore additional risk factors affecting preterm births, particularly in the UAE and similar regional settings.
4. Maternal education and public health initiatives: Increasing awareness among expectant mothers regarding modifiable risk factors such as infections, nutrition, and prenatal care adherence to reduce preterm birth rates.
5. Follow-up programs: Establishing long-term follow-up and developmental monitoring programs for preterm infants to assess neurodevelopmental outcomes and optimize post-discharge care.
6. Policy and infrastructure development: Encouraging healthcare policymakers to invest in neonatal research, advanced NICU facilities, and training programs to enhance the quality of neonatal care.

By implementing these recommendations, it is possible to further improve preterm birth outcomes, reduce neonatal complications, and enhance survival rates, ultimately contributing to better maternal and child health care at both institutional and national levels.

Conflict of Interest Statement

The authors have no potential conflicts of interest to disclose.

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