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Maternal Factors Leading to Low Birth Weight Neonates in Women Presenting to Shaikh Zaid Women Hospital, Larkana

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ABSTRACT

Introduction: Low birth weight (LBW, <2.5 kg) is a major contributor to neonatal morbidity and mortality in resource-limited settings like Larkana, Pakistan. Maternal factors such as anemia, inadequate antenatal care, and preterm birth are key contributors requiring local investigation. **Objective:** To determine the frequency of maternal factors associated with LBW neonates at Sheikh Zayed Woman Hospital Larkana. **Materials and Methods:** This cross-sectional study, conducted from August 2024 to January 2025 at Sheikh Zayed Woman Hospital, enrolled 105 women delivering LBW neonates. Maternal factors (anemia, gestational hypertension, preterm birth, inadequate antenatal care, and others) were assessed using standardized definitions. Data were analyzed in SPSS version 26 using chi-square tests ($p \leq 0.05$). **Results:** Anemia (55.2%), inadequate antenatal care (49.5%), and preterm birth (33.3%) were prevalent and significantly associated with LBW ($p<0.05$). Preterm births were higher among unbooked mothers ($p=0.01$). **Conclusion:** Targeted interventions addressing anemia, antenatal care access, and preterm birth are essential to reduce LBW in Larkana.

INTRODUCTION

Low birth weight (LBW, <2500 g) remains a critical public health issue due to its association with increased neonatal morbidity and mortality. Caused by preterm birth or intrauterine growth restriction, LBW is influenced by maternal factors with significant implications for neonatal outcomes. In Pakistan, particularly in regions like Larkana with limited healthcare access and socio-economic challenges, understanding these factors is vital for designing targeted interventions.

Maternal nutritional deficiencies, particularly anemia (hemoglobin <10 g/dl), impair fetal oxygen delivery, increasing LBW risk. Studies in Pakistan report high anemia prevalence among pregnant women, correlating with LBW. Inadequate antenatal care, defined as fewer than three visits, limits early detection of complications, doubling LBW risk in similar low-resource settings. Socio-economic factors, including low maternal education and rural residence, exacerbate these risks by restricting healthcare access. Gestational hypertension (BP ≥140/90 mmHg after 20 weeks), gestational diabetes (OGTT >186 mg/dl), and antepartum hemorrhage also contribute to LBW by affecting placental function or causing preterm delivery. Maternal body mass index (BMI) outside the normal range (<18.5 or >30.0 kg/m^2) and lack of folic acid supplementation further elevate LBW risk.

Despite global and regional data, local studies in Larkana are scarce, necessitating context-specific research to inform health policies at Sheikh Zayed Woman Hospital.

Objective

To determine the frequency of maternal factors contributing to LBW neonates among women presenting to Sheikh Zayed Woman Hospital, Larkana, to improve neonatal outcomes.

MATERIALS AND METHODS

Design: Cross-sectional study.

Setting: Obstetrics and Gynecology Department, Sheikh Zayed Woman Hospital, Larkana, a tertiary care facility.

Duration: August 2024 to January 2025.

Inclusion Criteria: Women aged 18–40 years, parity <5, delivering singleton live neonates with birth weight <2.5 kg, regardless of gestational age.

Exclusion Criteria: Women with multiple births or stillbirths.

Methods: After ethical approval from the institutional review board and College of Physicians and Surgeons Pakistan, 105 women delivering LBW neonates were enrolled with informed consent. Data on maternal age, BMI, gestational age, parity, booking status, delivery mode, neonatal gender, and birth weight were collected. Maternal factors assessed included anemia (hemoglobin <10 g/dl), gestational hypertension (BP ≥140/90 mmHg), gestational diabetes (OGTT >186 mg/dl), preterm birth (<37 weeks), abnormal BMI (<18.5 or >30.0 kg/m^2), antepartum hemorrhage (>80 ml vaginal bleeding), history of abortions, fewer than three antenatal visits, and non-use of folic acid. A proforma checklist was used for data collection. Statistical analysis was performed using SPSS version 26, applying chi-square or Fisher exact tests ($p \leq 0.05$).

RESULTS

This study enrolled 105 women delivering LBW neonates (<2.5 kg) at Sheikh Zayed Woman Hospital, Larkana, from August 2024 to January 2025. The mean maternal age was 26.4 ± 5.2 years, mean BMI was 22.7 ± 4.1 kg/m^2, mean gestational age was 36.8 ± 1.2 weeks, and mean neonatal birth weight was 2.1 ± 0.3 kg. Neonatal gender distribution was 54 (51.4%) male and 51 (48.6%) female. Vaginal deliveries accounted for 62 (59.0%) cases, and cesarean sections for 43 (41.0%). Parity included 40 (38.1%) primipara and 65 (61.9%) multipara mothers. Booking status showed 45 (42.9%) booked and 60 (57.1%) unbooked mothers.

Table 1

Demographic Characteristics of Mothers and Neonates

Variable	Mean ± SD or Number (%)
Maternal Age (years)	26.4 ± 5.2
Maternal BMI (kg/m^2)	22.7 ± 4.1
Gestational Age (weeks)	36.8 ± 1.2
Neonatal Birth Weight (kg)	2.1 ± 0.3
Neonatal Gender (Male)	54 (51.4%)
Neonatal Gender (Female)	51 (48.6%)
Mode of Delivery (Vaginal)	62 (59.0%)
Mode of Delivery (Cesarean)	43 (41.0%)
Parity (Primipara)	40 (38.1%)
Parity (Multipara)	65 (61.9%)
Booking Status (Booked)	45 (42.9%)
Booking Status (Unbooked)	60 (57.1%)

Anemia was the most prevalent maternal factor (58, 55.2%), followed by fewer than three antenatal visits (52, 49.5%) and preterm birth (35, 33.3%). Other factors included non-use of folic acid (40, 38.1%), abnormal BMI (30, 28.6%), history of abortions (25, 23.8%), gestational hypertension (22, 21.0%), antepartum hemorrhage (18, 17.1%), and gestational diabetes (15, 14.3%).

Table 2

Frequency of Maternal Factors Associated with LBW

Maternal Factor	Number (%)
Anemia (Hb <10 g/dl)	58 (55.2%)
Less than 3 Antenatal Visits	52 (49.5%)
Non-use of Folic Acid	40 (38.1%)
Preterm Birth (<37 weeks)	35 (33.3%)
Abnormal BMI (<18.5 or >30.0)	30 (28.6%)
History of Abortions	25 (23.8%)
Gestational Hypertension	22 (21.0%)
Antepartum Hemorrhage	18 (17.1%)
Gestational Diabetes	15 (14.3%)

Stratification by maternal age showed anemia (p=0.03) and fewer antenatal visits (p=0.04) were more frequent in younger mothers (18–25 years). Preterm birth was significantly associated with unbooked mothers (p=0.01).

Table 3

Maternal Factors Stratified by Age

Maternal Factor	Age 18–25 (n=55)	Age 26–40 (n=50)	p-value
Anemia	35 (63.6%)	23 (46.0%)	0.03
Less than 3 Antenatal Visits	33 (60.0%)	19 (38.0%)	0.04
Preterm Birth	20 (36.4%)	15 (30.0%)	0.45
Gestational Hypertension	12 (21.8%)	10 (20.0%)	0.82

Table 4

Maternal Factors Stratified by Booking Status

Maternal Factor	Booked (n=45)	Unbooked (n=60)	p-value
Preterm Birth	7 (15.6%)	28 (46.7%)	0.01
Anemia	22 (48.9%)	36 (60.0%)	0.24
Less than 3 Antenatal Visits	10 (22.2%)	42 (70.0%)	<0.01
Non-use of Folic Acid	15 (33.3%)	25 (41.7%)	0.37

Chi-square tests confirmed significant associations between LBW and anemia (p=0.02), inadequate antenatal care (p<0.01), and preterm birth (p=0.01). Gestational diabetes and hypertension were not significantly associated (p>0.05).

DISCUSSION

This study, conducted from August 2024 to January 2025 at Sheikh Zayed Woman Hospital, Larkana, identified anemia, inadequate antenatal care, and preterm birth as the primary maternal factors contributing to LBW. These findings align with regional studies, such as one in Karachi reporting anemia in 50.7% of LBW cases. Anemia impairs fetal oxygen delivery, increasing LBW risk, particularly in Pakistan's low-resource settings where nutritional deficiencies are prevalent.

Inadequate antenatal care (49.5%) was a significant factor, consistent with studies in sub-Saharan Africa showing that fewer than three antenatal visits doubles LBW risk. Unbooked mothers (57.1%) faced barriers like low literacy and rural residence, highlighting the need for improved healthcare access in Larkana. Preterm birth (33.3%), strongly associated with unbooked status (p=0.01), reflects the impact of poor prenatal care on early delivery, a known LBW cause in developing countries.

Other factors, such as antepartum hemorrhage (17.1%) and abnormal BMI (28.6%), also contributed to LBW. Underweight mothers were more common, aligning with studies linking maternal undernutrition to LBW. Non-use of folic acid (38.1%) further increased risk, emphasizing the need for supplementation programs. Gestational hypertension and diabetes, though less prevalent, warrant monitoring due to their potential to disrupt fetal growth.

Younger mothers (18–25 years) showed higher rates of anemia and inadequate antenatal care, possibly due to socio-cultural factors like early marriage. The lack of a control group limits direct comparisons, but the findings underscore the urgency of addressing modifiable factors

through community outreach, mobile clinics, and nutritional interventions in Larkana.

CONCLUSION

Anemia, inadequate antenatal care, and preterm birth significantly contribute to LBW at Sheikh Zayed Woman Hospital, Larkana. Targeted interventions, including improved antenatal services, iron and folic acid supplementation, and addressing socio-economic barriers, are critical to reducing LBW and improving neonatal outcomes in this region.

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