

# INCIDENCE AND RISK FACTORS OF OBSTRUCTED LABOR LEADING TO EMERGENCY HYSTERECTOMY IN PAKISTAN: A RETROSPECTIVE STUDY

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## Abstract

**Background:** Obstructed Labor continues to be the major cause of maternal morbidity and mortality in low resource settings. Delays in referrals and the improper care provided by unqualified birth attendants, like lady health visitors and traditional birth attendants (Dais), play a significant role in negative outcomes in Pakistan. Emergency hysterectomy can be lifesaving, it often has devastating impacts on reproductive health and overall quality of life.

**Methods:** This retrospective study reviewed records from Women & Children Teaching Hospital, D.I. Khan, from July 2020 to August 2025. Data were analyzed using SPSS version 25, with descriptive statistics presented as numbers and percentages. The study included all women who underwent emergency hysterectomy due to obstructed labor or uterine rupture. Data on demographics, labor characteristics, referral delays, and intraoperative findings were collected and analyzed.

**Results:** During the study period, there were 47,405 deliveries, of which 125 women (0.26%) required emergency hysterectomy due to obstructed labor. All patients were initially managed by unqualified LHVs or dais before referral. The majority (89%) presented after >12 hours of obstructed labor, and 84% had injudicious oxytocin augmentation prior to referral. Grand multiparity (88.8%), teenage pregnancy (10%), and cephalopelvic disproportion (82%) were common risk factors. Uterine rupture was the most frequent intraoperative finding (68%), followed by atonic uterus unresponsive to medical management (32%). The maternal mortality rate was 18%, while perinatal mortality reached 55%.

**Conclusion:** Obstructed Labor leading to emergency hysterectomy remains worryingly common in Pakistan, however it is largely preventable through timely and skilled obstetrical care. Unqualified Lady health visitors and traditional birth attendants is the major determinant for this mismanagement. This can be overcome by strengthening regulation of unskilled providers, community education and improving the referral system.

## 1.0 INTRODUCTION

A failure of the fetus to descend despite adequate uterine contractions is termed as Obstructed Labor. It remains a preventable obstetric

emergency that continues to be life threatening in low and middle income countries [1]. The common causes of obstructed labor include malpresentation, malposition, fetal abnormalities,

pelvic structural abnormalities, and cephalopelvic disproportion. And prolonged labor, maternal exhaustion, sepsis, postpartum hemorrhage, fistula formation, uterine rupture, and perinatal death are all possible outcomes if it is not detected and treated quickly. In Pakistan, the ratio of maternal mortality with obstructed labor remains unacceptably high at around 186 deaths per 100,000 live births [2].

Despite of international efforts to lower maternal mortality to less than 70 per 100,000 live births in line with the World Health Organization's Sustainable Development Goals (SDGs), nations like Pakistan still confront significant systemic and infrastructural obstacles in the provision of maternal healthcare. EPH (Emergency Peripartum Hysterectomy) involves the surgical removal of the uterus during delivery or in the immediate postpartum period, which stands one of the devastating complications of obstructed labor [3]. Although it is a lifesaving procedure performed to control massive hemorrhage due to uterine rupture, it carries physical, psychological, and social consequences for women in their reproductive years. The incidence of EPH varies significantly across low or high resource settings, ranging from 0.24 to 10.52 and 0.2 to 0.8 per 1000 deliveries respectively [4,5].

The disparities in prenatal care coverage, emergency obstetric services availability, prompt referral systems, blood transfusion facilities, and access to trained birth attendants are all reflected in this large variation. Additionally, the etiology of EPH has changed from obstructed labor to abnormal placentation in high-income countries due to rising rates of cesarean sections worldwide, while obstructed labor and uterine rupture continue to be the main causes in low-resource settings. In Pakistan, around 49% of the deliveries still happen at home and nearly 52% are assisted by unskilled providers, like lady health visitors and traditional birth attendants [6]. Lady health visitors are trained in basic health promotion however lack formal obstetrical training. Consequently, they are not qualified to conduct deliveries and manage labor complications independently [7]. Similarly, Traditional birth attendants (Dais), often elderly women with no

formal training are closely tied to their communities and continue to be the primary care providers in rural & undeserved areas due to cultural preferences, accessibility and affordability [8]. The consequences of this reliance could be catastrophic. Delays in detecting labor complications, in judicious use of oxytocin to expedite delivery, application of fundal pressure and late referrals can contribute to preventable maternal deaths and severe morbidities like uterine rupture and the need for emergency hysterectomy.

## 2.0 MATERIALS AND METHODS

### 2.1 Study Design and Setting

This retrospective observational study was conducted at Women & Children Teaching Hospital, Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan, a tertiary referral center serving the southern districts of the province, with approximately 9,000–10,000 deliveries annually. The study period spanned five years, from July 2020 to August 2025.

### 2.2 Study Population

All women who had an emergency hysterectomy during the study period with obstructed labor and/or uterine rupture as the primary indication and full medical records were available were included in the study. Hysterectomies that were planned or elective were not included. We also excluded cases where emergency hysterectomy was performed for reasons other than obstructed labor, such as postpartum hemorrhage from uterine atony without obstructed labor beforehand, or placenta accreta or percreta without labor. The final analysis did not include records with incomplete data.

### 2.3 Data Collection

A structured proforma was used to extract data retrospectively from patient files, operating room records, and hospital registers. Demographics (age, parity, gestational age, residence, socioeconomic status, and education), obstetrics (antenatal booking status, place of initial labor management, length of labor prior to hospital arrival, type of birth attendant, use of oxytocics/uterotonics,

mode of attempted delivery, and prior cesarean section), and clinical presentation at admission (fetal heart status, diagnosis, and vital signs) were among the variables. The type of hysterectomy (total or subtotal), the primary surgical indication, any associated organ injuries, the estimated blood loss, and the need for transfusions were all noted during the procedure. Perinatal outcomes (live birth, stillbirth, or early neonatal death) and maternal outcomes (mortality and morbidity, including ICU admission, re-operation, sepsis, and renal failure) were recorded.

**2.4 Operational Definitions**

The failure of the presenting part to descend despite sufficient uterine contractions for over 12 hours, accompanied by clinical signs like molding, caput formation, Bandl's ring, or maternal exhaustion, was referred to as obstructed labor. Traditional birth attendants (dais) or lady health visitors who lack official midwifery or obstetric training are referred to as unskilled birth attendants. The term "injudicious oxytocin use" refers to the use of oxytocin by unqualified personnel, especially outside of healthcare facilities, or without the proper indication or monitoring. The definition of grand multiparity was parity  $\geq 5$ . Maternal mortality was defined as death from pregnancy-related or pregnancy-aggravated causes that occurred during pregnancy or within 42 days after it ended.

**2.5 Data Analysis**

The data were analyzed with IBM SPSS Statistics version 25.0. Categorical variables were shown as frequencies and percentages. Continuous variables were summarized as mean  $\pm$  standard deviation or median (interquartile range), depending on what was appropriate.

**2.6 Ethical Considerations**

The ethical approval was granted by the Institutional Review Board of Gomal Medical College, D.I. Khan, affiliated with Women & Children Teaching Hospital. Due to the retrospective nature of the chart review, the requirement for informed consent was waived. Confidentiality was ensured by using coded identifiers and secure data storage.

**3.0 RESULTS**

**3.1 Incidence of Emergency Hysterectomy**

During the five-year study period (July 2020 to August 2025), a total of 47,405 deliveries were conducted at Women & Children Teaching Hospital, D.I. Khan. Of these, 125 women underwent emergency hysterectomy primarily due to obstructed labor and/or ruptured uterus, yielding an incidence rate of 2.6 per 1,000 deliveries (0.26%) or approximately 1 in 379 deliveries. Emergency hysterectomy due to obstructed labor had a great ratio among the obstetric surgical emergencies during this study period

**3.2 Demographic Characteristics:**

The demographic profile of the study population is presented in Table 1. Most women affected were grand multiparous, with 88.8% having a parity of five or more. Teenage pregnancies accounted for 10.4% of cases. An overwhelming majority (93.6%) came from rural backgrounds, and illiteracy was common, affecting 81.6% of the women. Nearly all patients (95.2%) belonged to low socioeconomic strata. The demographic pattern indicates that socially and economically disadvantaged women are predominant, who have limited access to education and healthcare services.

**Table 1: The Demographic Characteristics of Women Who Underwent Emergency Hysterectomy (N=125)**

CHARACTERISTIC	N (%)
<b>Age (years)</b>	
<20 (teenage pregnancy)	13 (10.4%)
20-30	67 (53.6%)
31-40	42 (33.6%)

>40	3 (2.4%)
<b>Parity</b>	
Primigravida	4 (3.2%)
Para 2-4	10 (8.0%)
Grand multipara (≥5)	111 (88.8%)
<b>Gestational Age</b>	
37-40 weeks	98 (78.4%)
>40 weeks	27 (21.6%)
<b>Residence</b>	
Rural	117 (93.6%)
Urban	8 (6.4%)
<b>Education Level</b>	
Illiterate	102 (81.6%)
Primary	18 (14.4%)
Secondary or above	5 (4.0%)
<b>Socioeconomic Status</b>	
Low	119 (95.2%)
Middle	6 (4.8%)

### 3.3 Obstetric and Referral Characteristics

The obstetric and management characteristics prior to hospital arrival are summarized in Table 2. Several critical patterns emerged from the analysis. All women were initially managed by unskilled birth attendants, including dais and lady health visitors. The vast majority (93.6%) were unbooked and had received no formal antenatal care. Most patients (89%) reached the hospital only after enduring more than 12 hours of obstructed labor. Alarming, 84% had been given

oxytocin by unskilled attendants without appropriate monitoring, and 78.4% were subjected to fundal pressure a harmful traditional practice. In addition, every woman had undergone multiple vaginal examinations by untrained hands, substantially increasing the risk of infection. These results suggest considerable delays in care-seeking and receiving appropriate medical management, as described in the three-delay model of severe maternal morbidity.

**Table 2: Obstetric and Referral Characteristics (N=125)**

CHARACTERISTIC	N (%)
<b>Antenatal Care (Booking Status)</b>	
Booked (≥4 ANC visits)	0 (0%)
Partially booked (1-3 visits)	8 (6.4%)
Unbooked	117 (93.6%)
<b>Initial Place of Labor Management</b>	
Home with dai (traditional birth attendant)	89 (71.2%)
LHV clinic/center	36 (28.8%)
<b>Type of Birth Attendant</b>	
Dai (traditional birth attendant)	89 (71.2%)
Lady Health Visitor (LHV)	36 (28.8%)
Skilled midwife/doctor	0 (0%)
<b>Duration of Labor Before Referral</b>	
<12 hours	14 (11.2%)

12-24 hours	76 (60.8%)
>24 hours	35 (28.0%)
<b>Use of Oxytocics Prior to Referral</b>	
Yes (injudicious use)	105 (84.0%)
No	20 (16.0%)
<b>Attempted Delivery Maneuvers</b>	
Fundal pressure	98 (78.4%)
Attempted instrumental delivery	12 (9.6%)
Multiple internal examinations	125 (100%)
<b>Previous Cesarean Section</b>	
Yes	18 (14.4%)
No	107 (85.6%)

**3.4 Clinical Presentation on Arrival**

At the time of admission to the tertiary care hospital, most women were in a critical condition. Shock, defined as a systolic blood pressure below 90 mmHg, was present in 87 patients (69.6%). Clinical features suggestive of uterine rupture—such as abdominal tenderness and absent fetal heart sounds—were noted in 85 cases (68.0%). Intrauterine fetal death had already occurred in 112 women (89.6%). Severe anemia with levels below 7 g/dL was present in 94 patients (75.2%), and sepsis was present in 34 women (27.2%). The high incidence of shock, severe anemia, and intrauterine fetal death in these patients at presentation was due to delayed presentation and advanced complications.

**3.5 Risk Factors for Obstructed Labor:**

The most common identified risk factors are presented in Table 3. Intraoperatively, uterine rupture emerged as the leading indication for surgery, accounting for 68% of cases, with most ruptures involving the lower uterine segment. All patients required blood transfusion, with an average of 6.2 units administered per patient. Subtotal hysterectomy was performed in the majority of cases (89.6%), primarily because it allowed for quicker control of bleeding and shorter operative time in hemodynamically unstable women. Bladder injury was noted in 6.4% of cases and was treated with immediate repair. The high percentage of subtotal hysterectomy is consistent with the poor hemodynamic condition of the patients on presentation. The intraoperative findings and surgical details are given in Table 4.

**Table 3: Risk Factors for Obstructed Labor (N=125)**

Risk Factor	n (%)
Grand multiparity (≥5)	111 (88.8%)
Cephalopelvic disproportion	103 (82.4%)
Malpresentation (transverse lie, brow)	19 (15.2%)
Previous cesarean section (scar rupture)	18 (14.4%)
Teenage pregnancy (<20 years)	13 (10.4%)
Macrosomia (birth weight >4 kg)	8 (6.4%)
Short stature (<145 cm)	47 (37.6%)

**Table 4: Intraoperative Findings and Surgical Details (N=125)**

Finding/Detail	n (%)
<b>Primary Indication for Hysterectomy</b>	
Uterine rupture	85 (68.0%)
Atonic uterus (unresponsive to medical management)	40 (32.0%)
<b>Type of Hysterectomy</b>	
Subtotal hysterectomy	112 (89.6%)
Total hysterectomy	13 (10.4%)
<b>Site of Uterine Rupture (n=85)</b>	
Lower segment	62 (72.9%)
Fundal/lateral	23 (27.1%)
<b>Associated Injuries</b>	
Bladder injury	8 (6.4%)
Bowel injury	0
<b>Blood Transfusion</b>	
Required transfusion	125 (100%)
Mean units transfused (packed RBCs)	6.2 ± 2.4 units

**3.6 Maternal Outcomes**

The maternal mortality rate was 18.4%, with 23 deaths recorded among 125 cases. Hemorrhagic shock was the leading cause of death, accounting for 60.9% of fatalities, followed by septic shock in 26.1%. Of the survivors, morbidity remained

high: 76.5% required admission to the intensive care unit, and 30.4% went on to develop acute kidney injury. The case fatality rate does point to a severe clinical burden associated with obstructed labor complicated by uterine rupture and emergency hysterectomy.

**Table 5: Maternal Outcomes (N=125)**

Outcome	n (%)
Maternal Mortality	23 (18.4%)
<b>Causes of Maternal Death (n=23)</b>	
Hemorrhagic shock	14 (60.9%)
Septic shock	6 (26.1%)
Multi-organ failure	3 (13.0%)
<b>Maternal Morbidity (Survivors, n=102)</b>	
ICU admission	78 (76.5%)
Acute kidney injury	31 (30.4%)
Disseminated intravascular coagulation	19 (18.6%)
Wound infection/dehiscence	24 (23.5%)
Prolonged hospital stay (>10 days)	89 (87.3%)

**3.7 Perinatal Outcomes**

Perinatal mortality was alarmingly high at 94.4%. The vast majority of fetuses (89.6%) were already deceased at the time of hospital admission. Of the 13 babies born alive, only seven survived into the

second week of life, and the perinatal survival rate works out to a mere 5.6%. These findings show the outcome of obstructed labor and failure to refer such cases to tertiary care facilities in time.

**Table 6: Perinatal Outcomes (N=125)**

Outcome	n (%)
Intrauterine fetal death (on arrival)	112 (89.6%)
Live birth	13 (10.4%)
Early neonatal death (<7 days)	6 (46.2% of live births)
Neonatal survival	7 (5.6% overall)
Total Perinatal Mortality	118 (94.4%)

#### 4.0 DISCUSSION

This study has highlighted alarming findings regarding the incidence and outcomes of EPH secondary to obstructed labor in a tertiary care setting in Pakistan. The incidence rate of 2.6 per 1,000 deliveries is significantly higher than that reported for high-income countries, reflecting the continued burden of maternal morbidity in low-resource settings. Notably, all women who underwent EPH had initially been managed by unskilled birth attendants, including traditional dais and lady health visitors, suggesting a critical gap in the early recognition and referral of obstetric complications. These untrained providers do not have the appropriate skills to recognize signs of obstructed labor, including cervical dilatation, caput succedaneum, and fetal distress. Rather than referring the women, harmful practices are resorted to, which have catastrophic consequences. The use of oxytocin was misused in 84% of cases, which is known to cause hypertonus and rupture in cases where there was no indication. Fundal pressure was another form of harmful practice resorted to in 78.4% of cases. This practice is known to cause rupture, abruptio placentae, and fetal damage. Also, 89% of women were referred after more than 12 hours of labor, which is known to result in irreversible complications. These observations are in line with the findings from other studies in Pakistan and other countries in South Asia, indicating the major contribution of unskilled birth attendance to the risk of maternal near-miss deaths.

A similar study done in Quetta observed the prominent share of emergency hysterectomies for unbooked patients who were referred from peripheral units or received care from traditional birth attendants. The major risk factor was found to be grand multiparity, accounting for 88.8%.

This observation is in accordance with the proven fact of the association of uterine rupture with high parity. This is because with increasing parity, the thickness of the uterine wall decreases with each successive pregnancy. This risk may be compounded by the misuse of oxytocin. This could be explained by the high birth rates in rural Pakistan in which such education for the use of contraceptives is lacking. Cephalo-pelvic disproportion, which occurred in 82.4%, is considered clinically important when labor is inappropriately augmented, whereas teenage pregnancies (10.4%), as well as short stature (37.6%), add to the chain of problems. The high number (93.6%) of unbooked patients speaks to an ineffective antenatal screening program. The rupture of the uterus was the most common cause of hysterectomy, accounting for 68% of cases, with the majority (72.9%) involving the lower uterine segment, while for grand multiparas, fundal or lateral uterine ruptures occurred more commonly (27.1%) due to incorrect administration of oxytocin. In addition, oxytocin has been classified by the WHO as a high-alert medication requiring close monitoring and prompt surgical intervention, which are not possible in home or LHV clinic environments. Mortality for this group of mothers was high, with 18.4% of deaths due to hemorrhagic shock (60.9%) and sepsis (26.1%), further complicated by delayed presentation and severe anemia with hemoglobin levels below 7 g/dL in 75.2% of cases.

The perinatal mortality was alarmingly high at 94.4%, with 89.6% fetuses already deceased at hospital admission, while of the 13 live-born infants, only seven survived beyond the first week of life. These results reflect the devastating consequences of delayed recognition and referral of obstructed labor and stress the urgent need to

strengthen skilled birth attendance, coverage of antenatal care, and timely referral systems. This study therefore reiterates that obstructed labor continues to cause high levels of preventable maternal and fetal morbidity and mortality in Pakistan due to unskilled care, delayed presentation, high parity, and inappropriate management of labor. The mainstay of targeted intervention in this regard would be community education, enhanced antenatal screening, and regulated, supervised use of oxytocin, which can go a long way in reducing the burden of emergency hysterectomy and its maternal-fetal complications.

## CONCLUSION

Emergency hysterectomies due to obstructed labor continue to be a serious and preventable area of maternal and perinatal mortality and morbidity in Pakistan. Such a high incidence may be attributed to the consequences of delayed referrals, mismanagement by unskilled attendants, misuse of oxytocin, absence of antenatal care, and increased risk factors of grand multiparity and cephalopelvic disproportion. Uterine rupture has emerged as the leading cause of hysterectomies with disastrous maternal-fetal consequences. In preventing the occurrence of unfavorable consequences, urgent and concerted action for ensuring the presence of a skilled birth attendant, the use of oxytocin, increased access to antenatal care services, risk screening, referrals, community education on danger signs of OB, and the provision of family planning services are necessary. Emergency hysterectomy in cases of obstructed labor should be viewed as a marker of failure of the health system, rather than a complication of labor. It is believed with the implementation of interventions, the burden of obstructed labor can be reduced in Pakistan, and the country can work towards achieving the Sustainable Development Goal of reducing maternal mortality.

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## Conflict of Interest

The authors declare no conflicts of interest.

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