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Fetomaternal Outcomes of Obstructed Labour in Tertiary Care Hospital Dera Ismail Khan

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ABSTRACT

Strong contractions that prevent the fetus from moving through the birth canal, known as obstructed labour, were often due to a mismatch between the size of the fetal head and the pelvis. Despite being preventable, this condition significantly contributes to maternal and neonatal morbidity and mortality and is a leading cause of hospitalization. **Objective:** To assess the frequency and types of adverse maternal and fetal outcomes associated with obstructed labour in Tertiary Care Hospital, Dera Ismail Khan. **Methods:** This cross-sectional study was conducted at the Department of Obstetrics and Gynecology, Gomal Medical College, Dera Ismail Khan, from December 1, 2021 to June 1, 2022. The sample size was 193 calculated using WHO sample size software by convenient sampling technique. Adverse fetomaternal outcomes such as bladder trauma, uterine rupture, hysterectomy, sepsis, Postpartum Hemorrhage (PPH), birth asphyxia, and stillbirth were the outcomes of the study. All the data were entered on a pre-designed proforma and analyzed by SPSS version 25.0. **Results:** The age range for pregnant women was Participants between 18 to 40 years with a mean age of 28.689±3.05 years, the average gestational age was 37.492±2.24 weeks and the average parity was 1.507±1.51. Bladder trauma was observed in 8.3% of patients, ruptured uterus 15.5%, hysterectomy 7.8%, sepsis 19.2%, PPH 6.2%, birth asphyxia 56.5%, and stillbirth was 33.2% **Conclusions:** This obstetrical emergency affects relatively younger women with a mean age of 28.69 years, with a mean gestational age of 37.49 weeks. Birth asphyxia and stillbirth were the common outcomes while maternal bladder trauma uterine rupture, hysterectomy sepsis, and postpartum hemorrhage were significant.

INTRODUCTION

Obstructed labour is the ultimate consequence of cephalopelvic disproportion when a fetus is unable to enter the birth canal despite strong contractions [1]. This can result in significant maternal and perinatal complications. The cephalopelvic disproportion could be either due to a contracted pelvis in a labouring mother where a normal-sized fetus cannot enter the pelvic inlet or due to fetal malpresentation and malpositioning of the fetal presenting part. The pelvis is contracted pelvis due to malnutrition, infection, muscular and bony disorders like poliomyelitis, sickle cell disease, or osteomyelitis in mothers [2]. The malpresentation includes brow and compound presentations, the persistent occiput-posterior position of the fetal head, mento-posterior face presentation, congenital anomalies like gross hydrocephalus, fetal ascites, etc [2]. Some pelvic causes include space-occupying tumors like fibroids in a lower uterine segment or ovarian tumors impacted in the pelvis below the presenting part and undiagnosed multiple gestations [1]. The fetal complications of obstructed labour are intracranial hemorrhage due to severe molding of the fetal head, severe caput formation, and acidosis due to fetal hypoxia and distress. This will lead to neonatal sepsis and increased perinatal mortality [3]. In case of prolonged obstructed labour, excessive pressure on the placenta and umbilical cord compression can lead to fetal distress poor neonatal outcome, or fetal death. Maternal complications like uterine rupture, PPH, septic shock, and maternal

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mortality are threatening. In contrast, long-term complications, like fistula, cervical stenosis, and infertility due to hysterectomy, uterine rupture, or Sheehan's syndrome significantly affect the quality of life of mothers [4, 5]. A study by Wonde TE et al., conducted in Ethiopia in 2015 about obstructed labour outcomes in 91 mothers revealed the frequency of bladder trauma as 8.8%, ruptured uterus 16.5%, hysterectomy 11%, sepsis 25.3%, PPH 11%, birth asphyxia 52.1%, and stillbirth was 36.2% [6]. Maternal mortality due to complications of pregnancy and childbirth like obstructed labour is on the rise globally [7]. In Southeast Asia, there is a paucity of data available on this subject at local levels. Despite its critical nature, there remains a notable gap in the existing literature about specific adverse outcomes and long-term complications of obstructed labour. In our local community, no such study was conducted previously. This study will provide insight into maternal and fetal complications in patients with obstructed labour.

The objective of this study was to determine the frequency and types of adverse maternal and fetal outcomes associated with obstructed labour in Tertiary Care Hospital, Dera Ismail Khan.

METHODS

This cross-sectional study was carried out in the Department of Obstetrics and Gynecology at Gomal Medical College, Dera Ismail Khan, from December 1, 2021, to June 1, 2022, after approval from the ethical board (Reference Letter No.258/GJMS/JC). The sample size of 193 was calculated using WHO sample size software with a 95% confidence interval, a 4% margin of error, and an expected frequency of bladder trauma of 8.8% in cases of obstructed labour by a convenient sampling technique [6]. The inclusion criteria were pregnant women with a single fetus confirmed on ultrasound with gestational age > 28 weeks calculated by last menstrual period, of any parity and obstructed labour as per operational definition while women with H/o placenta previa, uterine fibroids, and previous C-section were excluded from the study. Obstructed labour is diagnosed as per the following criteria. Vulva: oedematous. Vagina: dry and hot. Cervix: fully or partially dilated, oedematous, and not well applied to the head. The presenting part: high and not engaged or impacted in the pelvis. If head it showed excessive molding and caput formation. The demographics like age, gestational age, and parity were noted on a pre-designed proforma. Basic demographics (age, gestational age, and parity) were noted and Informed consent was taken from patients/caregivers, ensuring confidentiality and the fact that there was no risk involved to the patient while taking part in this study. Bladder trauma was diagnosed when indigo carmine dye was injected into the ureter or a portion of the kidney, it showed a blue-tinged urine leaking out of the bladder. Sepsis was diagnosed as the presence of at least two of the following four criteria, central temperature >38.5 C or <36.0 C, Tachycardia or bradycardia, respiration rate exceeding 2 square deviations from the age norm or the need for a ventilator, the number of white blood cells increased or decreased in comparison with the age norm. Postpartum hemorrhage was diagnosed when estimated blood loss was≥ 1000 ml postpartum after cesarean section and ≥ 500 ml after vaginal delivery within 24 hours. Birth asphyxia was diagnosed when the newborn not breathing(> 90 seconds) and the chest not rising symmetrically with a frequency of>30/minute on physical examination and an umbilical artery blood test showed a pH of <7.1 laboratory test. Stillbirth was diagnosed when a fetal loss as the fetus's heart stopped beating and it was diagnosed by ultrasonography after 28 weeks on LMP. Adverse fetomaternal outcomes were managed as per unit protocols and recorded on specially designed proforma. Data were analyzed with a statistical analysis program (IBM-SPSS version 25.0). Frequencies and percentages were computed for categorical variables like bladder trauma, ruptured uterus, hysterectomy, sepsis, PPH, birth asphyxia, and stillbirth. Mean ± SD was presented for quantitative variables like age, gestational age, and parity. Adverse fetomaternal outcomes were stratified about age, gestational age, and parity. Post-stratification using the chi-square test was applied, and p ≤0.05 was considered statistically significant.

RESULTS

The mean age was 28.68 ± 3.05 years with mean gestational age 37.49 ± 2.24 weeks and mean parity was 1.50 ± 1.51 (Table 1).

Table 1: Mean of Patients According to Age, Gestational Age and Parity(n=193)

S. No.	Demographics	Mean ± SD
1.	Age (Years)	28.68 ± 3.05
2.	Gestational Age (Weeks)	37.49 ± 2.24
3.	Parity	1.50 ± 1.51

Table 2 illustrates the feto-maternal outcomes associated with obstructed labor. Among the fetal outcomes, sepsis was noted in 19.2% of cases (37 out of 193), while stillbirth occurred in 33.2% (64 out of 193). For maternal outcomes, uterine rupture was reported in 15.5% of cases (30 out of 193). Postpartum Hemorrhage (PPH) was observed in 6.2% (12 out of 193), hysterectomy was required in 7.8% (15 out of 193), and bladder trauma was seen in 8.3% (16 out of 193) of cases.

Table 2: Feto-Maternal Outcomes Obstructed Labour

Variables	Yes N (%)	No N (%)
Fetal Outcomes		
Sepsis	37 (19.2%)	156 (80.8%)

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Still Birth	64 (33.2%)	129 (66.8%)
Maternal Outcomes		
Raptured Uterus	30 (15.5%)	163 (84.5%)
PPH	12 (6.2%)	181 (93.8%)
Hysterectomy	15 (7.8%)	178 (92.2%)
Bladder Trauma	16 (8.3%)	177 (91.7%)

Among women with 0-2 pregnancies, 14.7% experienced a ruptured uterus, while 85.3% did not. In the group with more than 2 pregnancies, 17.5% experienced a ruptured uterus, and 82.5% did not. There was no statistically significant difference in the occurrence of ruptured uterus based on parity. In the group with 0-2 pregnancies, 19.1% of women developed sepsis, while 80.9% did not. Among women with more than 2 pregnancies, 19.3% developed sepsis, and 80.7% did not. There was no statistically significant difference in the incidence of sepsis between the two parity groups (P-value>0.05) (Table 3).

Table 3: Comparison of Parity with Ruptured Uterus and Sepsis

S. No.	Parity	Ruptured Uterus			Sepsis		
		Yes N (%)	No N (%)	p-Value	Yes N (%)	No N (%)	p-Value
1.	0-2	20 (14.7%)	116 (85.3%)	0.620	26 (19.1%)	110 (80.9%)	0.977
2.	>2	10 (17.5%)	47 (82.5%)		11 (19.3%)	46 (80.7%)	
Total		30 (15.5%)	163 (84.5%)		37 (19.2%)	156 (80.8%)	

In the 28th to 39th week gestational age group, 34.2% of pregnancies resulted in stillbirth, while 65.8% did not. For pregnancies beyond 39 weeks, 28.1% resulted in stillbirth, and 71.9% did not. There was no statistically significant difference in the occurrence of stillbirth between these gestational age groups (Table 4).

Table 4: Comparison of Gestational Age with Still Birth

Gestational Age (Weeks)		Still Birth		p-Value
		Yes N (%)	No N (%)	
1	28-39	55 (34.2%)	106 (65.8%)	0.508
2	>39	9 (28.1%)	23 (71.9%)	
Total		64 (33.2%)	129 (66.8%)	

The data were categorized into two age groups: 18-30 years and over 30 years. In the 18-30-year group, 7.7% of women experienced PPH, while 92.3% did not. In the group over 30 years of age, 2% experienced PPH, and 98% did not. There was no statistically significant difference in the incidence of postpartum hemorrhage between the two age groups. In the 18-30 years' group, 9.1% of women underwent a hysterectomy, while 90.9% did not. In the group over 30 years of age, 4% of women underwent a hysterectomy, and 96% did not. The p-value for this comparison was 0.247, indicating no statistically significant difference in the incidence of hysterectomy between the two age groups. In the 18-30-year group, 8.4% of women experienced bladder trauma, while 91.6% did not. In the group over 30 years of age, 8% experienced bladder trauma, and 92% did not. The p-value for this comparison was 0.931, indicating no statistically significant difference in the incidence of bladder trauma between the two age groups (Table 5).

Table 5: Comparison of Age with Post-Partum Hemorrhage (PPH), Hysterectomy, and Bladder Trauma

Age (Years)	PPH			Hysterectomy			Bladder Trauma		
	Yes N (%)	N N (%)	p-Value	Yes N (%)	N N (%)	p-Value	Yes N (%)	N N (%)	p-Value
18-30	11 (7.7%)	132 (92.3%)	0.151	13 (9.1%)	130 (90.9%)	0.247	12 (8.4%)	131 (91.6%)	0.931
>30	1 (2%)	49 (98%)		2 (4%)	48 (96.0%)		4 (8%)	46 (92.0%)	
Total	12 (6.2%)	181 (93.8%)		15 (7.8%)	178 (92.2%)		16 (8.3%)	177 (91.7%)	

DISCUSSION

The prevalence of obstructed labour varies all over the world depending on factors like socioeconomic circumstances, health care access, etc. as reported in the current study obstructed labour was more prevalent in rural areas. The study conducted by Maged AM had the same result with patient turnover from rural areas presenting with obstructed labour. (65.3%) [8]. One of the major risk factors for obstructed labour was poor antenatal visits or poor access to health facilities. In our study, 73.6% of pregnant women had irregular antenatal checkups. These findings were consistent with research showing that mothers referred from health facilities have a higher risk of unfavorable maternal outcomes. This was consistent with a study where a large number of mothers resided in rural areas, making it difficult for them to access health facilities and delaying their access to care when problems arose [9]. Additionally, mothers who attempted labour at health centers or home experienced worse maternal outcomes compared to those who delivered in hospitals. This supports findings from a study in India and Halaba, which indicates that hospital-based deliveries benefit from better access to comprehensive emergency obstetric and newborn care compared to those at health centers or home [10-12]. In the current study, outcome of obstructed labor like PPH, sepsis and hysterectomy were a bit more common in younger age group. These findings were similar to studies conducted by Hofmeyr and Yifru where most of the cases were primiparas, young and presented with obstructed labour [13, 14]. Sepsis emerged as the most common maternal complication in cases of obstructed labour, occurring in 19.2% of patients. This finding aligns with research conducted by Tura and Abera in Ethiopia and Gafoor M in Pakistan, all of which identified sepsis as a significant complication associated with obstructed labour [15-17]. Sepsis often arises from infections related to prolonged labour or interventions, highlighting the importance of prompt and effective management. Additionally, Postpartum Hemorrhage (PPH) was seen in 6.2% of obstructed labour cases. This finding was supported by studies from Norway and Ethiopia, which

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similarly identify PPH as a significant complication in obstructed labour [18-20]. PPH can result from uterine atony, retained placenta, or delivery trauma, emphasizing the need for careful monitoring and timely intervention to manage bleeding effectively. This difference may be due to variations in labour duration, with prolonged labour leading to more complications. Other adverse outcomes included birth asphyxia and birth injuries. Maternal complications such as uterine rupture, sepsis, anemia, postpartum hemorrhage, bladder injury, and fistula were noted. There were many limitations to this study which was conducted in a remote area like ours. Although the sample size was small it may not represent the overall population and the impacts of such alarming obstetrical issues. Similarly, a short study period can cause long-term complications. Confounding factors like maternal age, socioeconomic status, and access to health care may influence outcomes. Health professionals need to educate pregnant women about the risks of obstructed labour to reduce trauma and improve outcomes.

CONCLUSIONS

This study has highlighted several important maternal and perinatal outcomes related to obstructed labour. This obstetrical emergency affects relatively younger women with a mean age of 28.69 years, with a mean gestational age of 37.49 weeks. Birth asphyxia and stillbirth were the common outcomes while maternal bladder trauma, uterine rupture, hysterectomy sepsis, and postpartum hemorrhage were significantly seen in all age groups.

Authors Contribution

Conceptualization: NB
Methodology: NB, SA, MG, SNM
Formal analysis: MG, UZ, UA
Writing, review and editing: NB, SA, MG, NL

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

All the authors declare no conflict of interest.

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