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Obstetric Outcomes of Fetal Malpresentation and Malpositions

Saira Khan[1], Fauzia Anbreen[1]

[1]Department of Obstetrics and Gynecology, DHQ Hospital, Dera Ismail Khan, KP, Pakistan.

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Corresponding Author: Saira Khan, Department of Obstetrics and Gynecology, DHQ Hospital, Dera Ismail Khan, KP, Pakistan.
Email: sarapocket06@gmail.com

Declaration

Author's Contributions: Dr. Saira Khan spearheaded the study's conceptualization, diligently prepared the manuscript, and assumed primary responsibility for the collection and management of hospital data. Dr. Fauzia Anbreen significantly contributed to shaping the study's framework, performed comprehensive data analysis and interpretation, and offered insightful feedback that greatly enriched the manuscript's clarity and depth.

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ABSTRACT

Background: Fetal malpresentation and malposition are leading contributors to the high rates of adverse obstetric outcomes such as obstructed labor, postpartum hemorrhage, and cesarean deliveries. Accurate data on these outcomes is critical in the improvement of maternal and neonatal care, particularly in resource-limited settings. **Methodology:** This descriptive study aimed to determine the frequency of obstetric outcomes in patients with fetal malpresentation and malposition. It was conducted at the Department of Obstetrics and Gynecology, DHQ Hospital, Dera Ismail Khan, over a period of five months, from August 2024 to December 2024. A sample size of 340 women aged 18 to 40 years with singleton pregnancy and ultrasound confirmation of fetal malpresentation or malposition. The excluded conditions are: stillbirth; placenta previa; uterine rupture, or any other major complication. Data of outcomes concerning obstetric cases were collected in relation to obstructed labor, postpartum hemorrhage, perineal tears, modes of delivery. The data analyzed were using SPSS version 26. **Results:** The mean age of participants was 28.09 ± 5.20 years, with a mean gestational age of 36.72 ± 2.95 weeks. Malpresentation was observed in 62.4% of cases, while 37.6% had malposition. Obstetric outcomes included obstructed labor in 12.9%, postpartum hemorrhage in 15.9%, and perineal tears in 4.7% of cases. Delivery modes comprised 6.5% vaginal deliveries, 74.4% emergency cesarean sections, and 15.9% elective cesarean sections. Malposition was significantly associated with perineal tears ($p = 0.036$). **Conclusion:** Fetal malpresentation and malposition are associated with a high prevalence of adverse obstetric outcomes, particularly emergency cesarean sections and obstructed labor.

INTRODUCTION

The abnormalities in fetal malpresentation and malposition's have persisted as a significant factor toward the practice of obstetrics, usually resulting in complication pathologies of labor and birth.[1] Malpresentation includes any presentation other than the vertex-that is, either breech, face, or shoulder presentations-whereas malposition refers to an abnormal alignment of the fetal skull in vertex presentation, such as occiput posterior or transverse positions.[2] These malpresentation and malposition's are commonly influenced by maternal pelvic structure, uterine defects, or multiparity and mainly detected through clinical examination or scan.[3] Early identification of presentation and positions is vital; both may have a major influence on the outcome of labor and health of mothers and neonates.[4]

Obstructed labor is one of the main effects associated with fetal malpresentation and malposition's, which is defined as the failure of fetal progression through the birth canal despite strong uterine contractions.[5] It has been linked to significant maternal morbidity, which includes PPH resulting from either uterine atony, trauma, or retained placental tissue.[6] Malpresentation is also linked with increased risks of third- and fourth-degree perineal tears, particularly with forceps vaginal delivery.[7] Further complications that can occur in this case are the need for vacuum extraction or forceps delivery. Though vaginal delivery may be

considered for certain malpresentations when conditions are appropriate, maternal trauma or neonatal distress usually requires alternative modes of delivery.[8]

The main result of unexpected complications of labor precipitated by malpresentation or malpresentation is emergency Caesarean section.[9] These conditions further contribute to an increased percentage of elective Caesarean section when diagnosed antenatally; this provides a method for a planned surgical intervention that reduces risks to both the mother and the infant.[10] However, emergency and elective cesarean sections are to be differentiated according to gestational age, fetal size, and maternal health. Appropriate antenatal monitoring, rapid diagnosis, and skilled obstetric management will be crucial in preventing complications related to fetal malpresentations and malposition's, aligned with the best outcome for both mother and child.[11]

A study conducted by Shruthi S and colleagues reported an incidence of obstructed labor at 6.9% and postpartum hemorrhage at 3.67% among patients with fetal malpresentation.[12] Similarly, research by Hussein SMK et al. highlighted that vaginal deliveries accounted for 12.7%, emergency cesarean sections for 71.7%, and elective cesarean sections for 15.7% in cases of fetal malposition.[13] Additionally, findings from Barrowclough J and associates revealed a 13.6% prevalence of perineal tears.[2]

Malpresentations and malpositions are associated with increased maternal and neonatal morbidity, including obstructed labor, perineal trauma, and the need for surgical interventions such as cesarean sections. Understanding the frequency, outcomes, and associated complications is critical to improving clinical decision-making, optimizing maternal and neonatal care, and reducing adverse outcomes in resource-limited and advanced healthcare settings alike. This research aims to provide evidence-based insights to guide obstetric management strategies and enhance overall patient safety.

METHODOLOGY

The descriptive study was conducted from August 2024 to December 2024 at the Department of Obstetrics and Gynecology, DHQ Hospital Dera Ismail Khan. A total of 340 participants were included in the study. The sample size was calculated using WHO sample size software with a 95% confidence level, a 2% margin of error, and an expected frequency of postpartum hemorrhage of 3.67% in patients with fetal malpresentation.[12] Women aged 18 to 40 years with singleton pregnancies beyond 32 weeks of gestation as per the last menstrual period (LMP), of any parity, and diagnosed with fetal malpresentation or malposition were included. Malpresentation was defined as any presentation other than vertex presentation (with the top of the head first) on ultrasound. Malpositions were defined as the following: occiput posterior position, characterized by the fetal spine being closest to the maternal abdominal wall with the skull deeper in the pelvis; brow presentation, where the fetal skull is hyperextended, with the frontal bones lower in the pelvis than the occiput, and difficulty visualizing facial structures; face presentation, where the entire fetal face including the nose, mouth, orbits, and chin is visible on ultrasound at the level of the pelvic inlet, with the fetal neck hyperextended; and transverse lie, where the fetal spine is perpendicular to the uterus, and neither the fetal head nor buttocks are engaged in the pelvis.

Exclusion criteria included women with stillbirth on ultrasound, a history of placenta previa, placental abruption, uterine rupture, preterm premature rupture of membranes (PPROM), or umbilical cord prolapse. Obstetric outcomes were defined as follows: obstructed labor was identified when the presenting part of the fetus could not progress into the birth canal despite strong uterine contractions. Postpartum hemorrhage was defined as an estimated blood loss of ≥1000 ml postpartum after cesarean section or ≥500 ml after vaginal delivery within 24 hours, measured by soaked gauzes and pads and blood clots weighed against a standard of 1 ml blood per gram. Perineal tear was defined as laceration of the vaginal mucosa, perineal skin, and deeper subcutaneous tissues, including the capsule and part of the anal sphincter muscle, observed on physical examination. Vaginal delivery referred to the process where regular uterine contractions caused the cervix to soften, thin (efface), and open (dilate), allowing the baby to travel through the uterus and the vaginal opening. Cesarean section was defined as the delivery of a baby through an incision in the abdomen, with emergency cesarean section described as any unplanned or unscheduled cesarean delivery, and elective cesarean section defined as one scheduled at least four days before the 39th week of gestation.

Participants were followed until delivery, and obstetric outcomes were documented as per operational definitions on a structured proforma. Data were analyzed using SPSS version 26. Frequencies and percentages were calculated for categorical variables. Mean ± SD or median (IQR) was reported for continuous variables. Stratification was performed and post-stratification analyses were conducted using chi-square or Fisher's exact test, with a p-value ≤0.05 considered statistically significant.

RESULTS

The study included a total of 340 participants, with a mean age of 28.09 ± 5.20 years and a mean gestational age of 36.72 ± 2.95 weeks. The average parity was 2.02 ± 1.29. Among the participants, 62.4% had

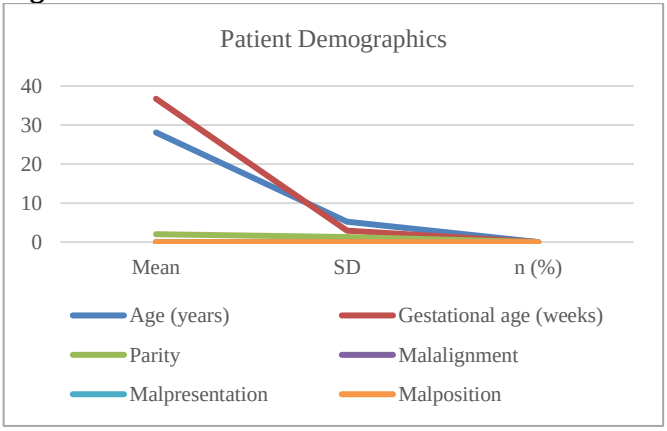
malpresentation, and 37.6% had malposition as shown in Table 1.

Table 1

Patient Demographics

Demographics		Mean ± SD / n (%)
Age (years)		28.094±5.20
Gestational age (weeks)		36.723±2.95
Parity		2.018±1.29
Malalignment	Malpresentation	212 (62.4%)
	Malposition	128 (37.6%)

Figure 1



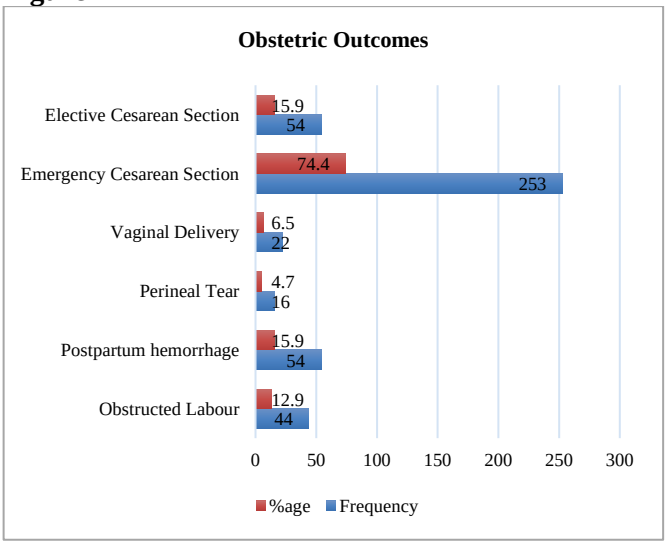
Obstetric outcomes revealed that 12.9% of patients experienced obstructed labor, 15.9% had postpartum hemorrhage, and 4.7% suffered perineal tears. Delivery modes included 6.5% vaginal deliveries, 74.4% emergency cesarean sections, and 15.9% elective cesarean sections as shown in Table 2.

Table 2

Obstetric Outcomes

Obstetric Outcomes	Frequency	%age
Obstructed Labour	44	12.9
Postpartum hemorrhage	54	15.9
Perineal Tear	16	4.7
Vaginal Delivery	22	6.5
Emergency Cesarean Section	253	74.4
Elective Cesarean Section	54	15.9

Figure 2



Stratified analysis showed a significant association between gestational age and obstructed labor, with 18.4% of cases occurring in gestational ages between 32–36 weeks, compared to 7.9% in those above 36 weeks (p = 0.004). Postpartum hemorrhage showed no significant associations with age, gestational age, or parity, but malposition trended higher in cases with hemorrhage (20.3% vs. 13.2%, p = 0.082). Perineal tears were significantly more common in cases with malposition (7.8% vs. 2.8%, p = 0.036) and showed non-significant trends with age (5.8% in those aged 18–30 vs. 2.6% in those over 30, p = 0.280) and parity (5.7% in parity 0–2 vs. 2.7% in parity >2, p = 0.281) as shown in Table 3.

Table 3

Association of Obstructed Labour, Postpartum hemorrhage and Perineal Tear with Clinical and Demographic Factors

Clinical and Demographic Factors		Obstructed Labour Yes n(%)	Obstructed Labour No n(%)	p-value
Age (years)	18-30	33 (14.7%)	191 (85.3%)	0.172
	>30	11 (9.5%)	105 (90.5%)	
Gestational age (weeks)	32-36	30 (18.4%)	133 (81.6%)	0.004
	>36	14 (7.9%)	163 (92.1%)	
Parity	0-2	29 (12.8%)	198 (87.2%)	0.897
	>2	15 (13.3%)	98 (86.7%)	
Malalignment	Malpresentation	30 (14.2%)	182 (85.8%)	0.392
	Malposition	14 (10.9%)	114 (89.1%)	
Clinical and Demographic Factors		**Postpartum hemorrhage Yes n(%)**	**Postpartum hemorrhage No n(%)**	**p-value**
Age (years)	18-30	37 (16.5%)	187 (83.5%)	0.656
	>30	17 (14.7%)	99 (85.3%)	
Gestational age (weeks)	32-36	23 (14.1%)	140 (85.9%)	0.391
	>36	31 (17.5%)	146 (82.5%)	
Parity	0-2	36 (15.9%)	191 (84.1%)	0.987
	>2	18 (15.9%)	95 (84.1%)	
Malalignment	Malpresentation	28 (13.2%)	184 (86.8%)	0.082
	Malposition	26 (20.3%)	102 (79.7%)	
Clinical and Demographic Factors		**Perineal Tear Yes n(%)**	**Perineal Tear No n(%)**	**p-value**
Age (years)	18-30	13 (5.8%)	211 (94.2%)	0.280*
	>30	3 (2.6%)	113 (97.4%)	
Gestational age (weeks)	32-36	7 (4.3%)	156 (95.7%)	0.731
	>36	9 (5.1%)	168 (94.9%)	
Parity	0-2	13 (5.7%)	214 (94.3%)	0.281*
	>2	3 (2.7%)	110 (97.3%)	

Malalignment	Malpresentation	6 (2.8%)	206 (97.2%)	0.036
	Malposition	10 (7.8%)	118 (92.2%)	

DISCUSSION

The findings of this study shed light on the significant impact of fetal malpresentation and malposition on obstetric outcomes, reinforcing their role as critical determinants of maternal and neonatal morbidity. By analyzing these conditions and their associated complications, this research provides evidence to guide clinical decision-making and enhance perinatal care. Key results demonstrated a higher prevalence of malpresentation (62.4%) compared to malposition (37.6%), underscoring the commonality of these challenges in obstetric practice. The mean gestational age for obstructed labor was significantly associated with 32–36 weeks (18.4%, p = 0.004); incomplete fetal engagement and unfavorable fetal positioning could account for this in earlier gestations. Emergency cesarean sections accounted for the major delivery modes of 74.4%; malalignment cases required surgical intervention. The complications included postpartum hemorrhage, present in 13.9% of the cases, with higher prevalence in malposition (20.3%, p = 0.082), which can be explained by mechanical difficulties during delivery or uterine atony. Perineal tears are related to malposition in a statistically significant way (7.8%, p = 0.036), showing the impact on maternal tissues of improper fetal alignment. These findings highlight the need for early detection and selective management strategies to reduce risk and enhance outcomes in patients with fetal malpresentation and malposition.

Maskey et al. [14] and Hussein and Alalaf [13] provided comprehensive insights into the outcomes of fetal malpresentation and malposition, which can be compared to our study's findings for a deeper understanding. Maskey et al. observed a malpresentation incidence of 2.5% among 4009 deliveries, with breech presentation being the most common (82.1%). In contrast, our study found a higher prevalence of malpresentation (62.4%) and malposition (37.6%), suggesting a greater burden of these conditions in our setting, possibly due to differences in study populations or diagnostic approaches. Similarly, Hussein and Alalaf reported a lower combined rate of malpresentation and malposition at 4.8%, with breech (45.3%) and occipito-posterior/transverse (44.7%) presentations being predominant.

Cesarean section was the dominant mode of delivery across all studies, accounting for 84.2% in Maskey et al. [14] 87.3% in Hussein and Alalaf [13] and 74.4% in our study. The slightly lower cesarean section rate in our study may reflect variations in clinical practices, availability of skilled obstetricians, or patient preferences. Vaginal delivery rates were higher in our study (6.5%) compared to 12.7% in Hussein and Alalaf's cohort, where occipito-posterior positions had a greater chance of vaginal delivery (26.1%). This difference could be attributed to our stricter criteria for vaginal deliveries in malpresentation and malposition cases. Neonatal outcomes also varied across studies. Maskey et al.[13] reported a NICU admission rate of 9.2%, while Hussein and Alalaf found a much higher rate of 25%, with 69.3% staying 2–4 days. In our study, NICU admission rates and detailed outcomes were not explicitly compared but are likely influenced by differences in healthcare infrastructure, neonatal resuscitation practices, and antenatal care quality. Neonatal mortality was 1% in Hussein and Alalaf's study, which was lower than our study's neonatal morbidity rates, possibly due to differences in referral patterns and availability of emergency care. One significant similarity across all studies was the association of malpresentation with primigravida status. Maskey et al. [14] noted that 61.3% of malpresentation cases were in primigravida women, while Hussein and Alalaf [13] reported 30% of cases in primiparous women, compared to our study's higher proportion of primigravidas with malpresentation. The common link could be attributed to anatomical factors and uterine tone in first pregnancies, making malpresentation more likely.

Differences in associated risk factors were also observed. Maskey et al. highlighted oligohydramnios (6.9%) as the most common predisposing factor, while Hussein and Alalaf identified asphyxia in 13.7% of neonates, compared to our study, where malpresentation was significantly linked to obstructed labor and perineal tears (p = 0.004 and p = 0.036, respectively). This study has several limitations. It was conducted as a single-center study, which may restrict the generalizability of the findings to other populations or healthcare systems with different clinical practices and resources. Additionally, while the cross-sectional design allowed for a snapshot of outcomes, it limits the ability to establish causal relationships or assess long-term maternal and neonatal outcomes.[15] The sample size, though sufficient for statistical analysis, may not capture rarer presentations or complications. Furthermore, variations in clinical decision-making, such as the criteria for vaginal versus cesarean delivery, could influence the reported outcomes and may not be directly comparable to other studies.[16] Future research, should consider a multicenter, longitudinal design with a larger, more diverse population to provide more robust, and generalizable conclusions.

CONCLUSION

Our study has so far established fetal malpresentation and malposition to have a greater association with the incidence of adverse obstetric and neonatal outcomes, a reason why management predominantly involves

delivery via cesarean section. Associated complications include obstructed labor, hemorrhage, rupture of membranes, and extensive vaginal tears/perineal trauma, thereby always warranting an early differential diagnosis and appropriate measures to be devised and implemented expeditiously. The study also gives a call to increased antenatal care with early detection and management of malpresentation/malposition, which will surely reduce adverse maternal and neonatal outcomes. Skillful obstetric care with accessible standardized protocol improves the outcome of such cases further.

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