

Fetal malposition and malpresentation: Mode of delivery and perinatal outcomes at Maternity Teaching Hospital in Erbil city

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Abstract

Background and objective: Delivering a malpositioned and malpresenting fetus remains uncertainty, despite advances in obstetric practice. This study aimed to determine the mode of delivery and neonatal outcome in cases of fetal malposition and malpresentation.

Methods: A cross-sectional study of women delivering malpositioned and malpresenting fetuses was conducted at Maternity Teaching Hospital, Erbil city, Kurdistan Region, Iraq, from the 1st of June, to the 30th of November, 2018. Three hundred women and their newborns were followed for seven days of life.

Results: The total rate of malposition and malpresentation was 4.8%. Most women (87.3%) delivered by cesarean section, 25% of the neonates were admitted to the neonatal intensive care unit, where 69.3% of these infants stayed for seven days. There were three early neonatal deaths (1.0%), all of them were in occipito-posterior, or occipito-transverse position and were delivered abdominally. Among occipito-posterior and occipito-transverse deliveries, 2.2% ended with the death of the fetus ($P = 0.360$). An Apgar score of 7 was recorded after 5 minutes for 97.7% of the infants. Around 11% of the women had postpartum hemorrhage.

Conclusion: Fetal malpresentation and malposition are not uncommon during labor, and most cases are delivered by cesarean section. Neonatal morbidity and mortality are dependent on the type of presentation and the mode of delivery.

Keywords: Malposition; Malpresentation; Perinatal outcome; Breech presentation.

Introduction

Abnormal fetal head presentation (malpresentation) and malposition are occasionally encountered during labor.¹ Spontaneous normal vaginal delivery is most common when the fetus is in vertex presentation, and the occiput is anterior. Any condition where the fetus is not in vertex presentation is regarded as a malpresentation, and positions other than occipito-anterior are malpositions.² The fetus is in breech presentation in 3-4% of term pregnancy, presenting its feet, buttocks, or both.³ Fetal malposition, either occipito-posterior or occipito-transverse, leads to a greater risk of cesarean delivery, prolonged labor, and increased perinatal morbidity.⁴ The fetus is in cephalic presentation in approximately (97%) of

deliveries. The abnormal presentation, usually breech, when the fetus's feet, buttocks, or both are the presenting part,³ complicates the remaining (3-4 %) of deliveries at term.^{3,5} Fetal malposition, either occipito-posterior or occipito-transverse, leads to a greater risk of cesarean delivery, prolonged labor, and increased perinatal morbidity.⁴ The proper management of fetal malpresentation and malposition and the achievement of good maternal and perinatal outcomes depend upon the provision of good antenatal care, with an elective cesarean section for some cases.⁵ Published research on fetal malpresentation and malposition has primarily either focused on one specific type of malpresentation, such as face and brow presentations^{6,7} or breech

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presentation,¹ and one type of abnormal position, such as occipito-posterior,⁸⁻¹⁰ or correlated fetal malpresentation and malposition with abnormalities in the labor process, such as prolonged or obstructed labor.¹⁰⁻¹² According to the authors' best knowledge, this study is the first to be conducted on all malpresentation and positions in one study. This study aimed to determine the mode of delivery and neonatal outcome in cases of fetal malposition and malpresentation delivered in Erbil Maternity Teaching Hospital.

Methods

This cross-sectional study of women delivering malpositioned and malpresenting fetuses was conducted in the labor room at Maternity Teaching Hospital in Erbil city, Kurdistan Region, Iraq, over 6-months, from 1st June to 30th of November, 2018. The inclusion criteria were age more than 18 years, singleton pregnancy either in labor or having vaginal labor delivery (spontaneous or induced labor) or abdominal delivery (elective or emergency cesarean section), vertex presentation of the fetus (face, brow, occipital-posterior or occipito-transverse), non-vertex presentation of the fetus (breech presentation, transverse presentations), gestational age 32-42 weeks, congenital malformation and agreement to participate in the study. Exclusion criteria were age less than 18 years, multiple gestations, macerated stillbirth, gestational age less than 32 weeks, instrumental delivery and refusal to participate in the study. All of the information about the women in the sample was collected using a questionnaire designed for the study that was completed in a face-to-face interview after written informed consent. Malpresentation is defined as any type of fetal presentation other than vertex. Breech presentation occurs when the fetal gluteal region, instead of the cephalic region, enters the pelvis first.³ Transverse lie of the fetus is a presentation where the long axis of the fetus is approximately perpendicular to the

long axis of the mother.¹³ In face presentation, the fetal head and neck are hyperextended, causing the occiput to come in contact with the upper back of the fetus while lying on the longitudinal axis.¹⁴ In brow presentation, the fetal head is midway between full flexion (vertex) and hyperextension (face) along the longitudinal axis.¹⁴ Malposition occurs when the fetal presentation is cephalic at the time of delivery, but the fetal cephalic position is not occipit anterior.¹⁵ Occipito-posterior position occurs when the fetal back is against the mother's back.¹⁶ Occipito-transverse position describes cases where the fetal back is against the mother's side.¹⁶ Early neonatal death, as defined by the World Health Organization, is the death of an infant during the first week of life following a live birth.¹⁷ During the study period, three groups of pregnant women were enrolled in the study. Women in the first group were admitted to Maternity Teaching Hospital as confirmed cases of fetal malpresentation and were prepared for cesarean section (e.g., term pregnancies with breech presentation or transverse lie at 40 weeks). Women in the second group had spontaneous labor with or without the rupture of membranes. Most women in this group had no or bad history of antenatal care. Malpresentation (i.e., transverse, breech, or face) was revealed by abdominal and pelvic examinations and ultrasounds. These women had emergency cesarean section deliveries. The third group of women had cephalic fetal presentation when labor began, and malposition was not diagnosed in early labor. For these women, abdominal and pelvic examinations were performed as part of the ordinary labor follow-up, fetal heart sound and vital signs were assessed, and a partogram was conducted. During follow-up at the late stage of labor, fetal malposition (e.g., persistent occipito-posterior or occipito-transverse position) was diagnosed. These women either delivered vaginally or were shifted to emergency

cesarean section, usually because of a prolonged second stage of labor or failure to progress in the first stage of labor. After these three groups of women were delivered, the following data were collected on all the newborns: Apgar score, weight, gender, presence of any malformations, admission to the neonatal intensive care unit (NICU), and viability of the fetus. Apgar scores were obtained 1 and 5 minutes after delivery. Apgar scores were classified as severely depressed (0–3), moderately depressed (4–6), or excellent (7–10).¹⁸ Newborns with Apgar scores less than 6 were admitted to the NICU. The newborns were followed for seven days of life. Mothers were monitored after delivery for 24 hours for the development of postpartum hemorrhage (PPH). Maternal hemorrhage, defined as a cumulative blood loss of at least 1000 ml. or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours after the delivery.¹⁹ Written informed consent to participate in the study was obtained from each woman. An official acceptance letter was obtained from the Erbil Directorate of Health granting permission to conduct this research at the hospital. All participants were assured that confidentiality would be maintained and that their information would only be used for research purposes. Data were analyzed using the statistical package for the social sciences (version 22). Chi-square test was used to compare proportions. Fisher's exact test was used when the expected count of more than 20% of the cells of a table was less than five. The significance level was set at ($P \leq 0.05$).

Results

There were 6138 deliveries during the study period, including 300 women with fetal malpresentation or malposition who agreed to participate in the study. Five cases with exclusion criteria and three cases declining to participate were excluded from the study. These 300 women constituted 4.8% of total deliveries for study enrollment. Of these 300 cases,

136 (45.3%) were breech presentation, three (1.0%) were face presentation, seven (2.3%) were brow presentation, 20 (6.7%) were transverse lie presentation, and 134 (44.7 %) had occipito-posterior or occipito-transverse fetal position. The mean age of mothers at delivery was (27.91 ± 7.07) years, the median age was 27 years, and age ranged from 13 to 48 years. Table 1 shows that half of the sample was aged 20–29 years, and 40% were aged 30 years or more. Around one-third (30%) of the women were primiparous, 59% were multiparous, and 11.0% were grand multiparous. The gestational age of the majority (90.3%) of the women was 37–42 weeks. The majority (77%) of the women had a history of antenatal care. Regarding educational level, most of the women (88%) were illiterate. Table 2 presents the neonatal characteristics of newborns. Only three neonates (1%) died within a few hours of delivery. The majority of the neonates (84%) were normal weight, 7% were low birth weight, and 9% were overweight. Table 2 also indicates that 21.3% of the newborns developed jaundice, and 13.7% developed asphyxia. In the first minute of life, the Apgar score was ≤ 3 for 2.3% of the neonates and 4–6 for 18% of the neonates. The rest of the newborns generally had normal Apgar scores. After 5 minutes, 97.7% of the neonates had an Apgar score of 7 or more. A total of 75 neonates (25%) were admitted to the NICU, and more than two-thirds (69.3%) stayed in the NICU for 2–4 days. Fetal presentation was mainly breech (45.3%) or cephalic (44.7%) presentation. Other fetal presentation types are indicated in Table 3.

Table 1: Mothers' characteristics.

Variable	No.	(%)
Age of mother (in years)		
< 20	30	(10.0)
20–29	150	(50.0)
≥30	120	(40.0)
Parity		
0 (Primiparous)	90	(30.0)
1–4 Multiparous)	177	(59.0)
> 4 (Grand multiparous)	33	(11.0)
Gestational age by ultrasound (in weeks)		
< 37	29	(9.7)
37–42	271	(90.3)
Antenatal care		
Yes	231	(77.0)
No	69	(23.0)
Educational level		
Illiterate	264	(88.0)
Literate	17	(5.7)
Primary school	16	(5.3)
Secondary school	2	(0.7)
College	1	(0.3)
Total	300	(100.0)

Table 2: Neonatal characteristics and outcome.

Variable	No.	(%)
Sex		
Male	165	(55.0)
Female	135	(45.0)
Outcome		
Alive	297	(99.0)
Early neonatal death	3	(1.0)
Weight (in grams)		
< 2500	21	(7.0)
2500–3999	252	(84.0)
≥ 4000	27	(9.0)
Jaundice		
Yes	64	(21.3)
No	236	(78.7)
Asphyxia		
Yes	41	(13.7)
No	259	(86.3)
Apgar in the first minute of life		
≤ 3	7	(2.3)
4–6	54	(18.0)
≥ 7	239	(79.7)
Apgar after 5 minutes		
4–6	7	(2.3)
≥ 7	293	(97.7)
NICU admission (N =75)		
≤ 1 day	14	(18.7)
2–4 days	52	(69.3)
> 4 days	9	(12.0)
Mode of delivery		
Vaginal delivery	38	(12.7)
Emergency cesarean section	215	(71.6)
Elective cesarean section	47	(15.7)
Total	300	(100.0)

NICU: Neonatal intensive care unit.

Table 4 shows that 12.7% of the women in the studied group delivered vaginally, but this percentage increased to 26.1% for women with the occipito-posterior or occipito-transverse position. Most women with a transverse lie (95%) delivered by emergency cesarean section, compared with 71.7% of the full sample ($P < 0.001$).

Table 5 shows that none of the women who delivered vaginally died. One neonate (0.5%) died during a 12-hour stay in the NICU following an elective cesarean section delivery, and two newborns (4.3%) died during 36- to 48-hour stays in the NICU following emergency cesarean section deliveries ($P = 0.108$).

Table 3: Fetal presentation type.

Presenting part	No.	(%)
Occipito-posterior or occipito-transverse	134	(44.7)
Breech	136	(45.3)
Transverse	20	(6.7)
Face	3	(1.0)
Brow	7	(2.3)
Total	300	(100.0)

Table 4: Mode of delivery by fetal presentation type.

	Vaginal delivery		Emergency cesarean section		Elective cesarean section		P value
	No.	(%)	No.	(%)	No.	(%)	
POP [†]	35	(26.1)	83	(61.9)	16	(11.9)	<0.001*
Breech	2	(1.5)	103	(75.7)	31	(22.8)	
Transverse	1	(5.0)	19	(95.0)	0	(0.0)	
Face	0	(0.0)	3	(100.0)	0	(0.0)	
Brow	0	(0.0)	7	(100.0)	0	(0.0)	
Total	38	(12.7)	215	(71.7)	47	(15.7)	

[†]Occipito-posterior or occipito-transverse. *Fisher's exact test.

Table 5: Early neonatal death by mode of delivery

	Alive		Early neonatal death		Total		P value
	No.	(%)	No.	(%)	No.	(%)	
Vaginal delivery	38	(100.0)	0	(0.0)	38	(100.0)	0.108*
Emergency cesarean section	214	(99.5)	1	(0.5)	215	(100.0)	
Elective cesarean section	45	(95.7)	2	(4.3)	47	(100.0)	
Total	297	(99.0)	3	(1.0)	300	(100.0)	

* Fisher's exact test.

Table 6 shows that all cases of early neonatal death were of occipito-posterior or occipito-transverse lie and that 2.2% of deliveries that were occipito-posterior or occipito-transverse ended with the death of the fetus ($P = 0.360$).

Discussion

Many retrospective and randomized studies have indicated that the lowest neonatal mortality and morbidity rates are probably achieved by cesarean section delivery in most, but not all, cases.^{20–22} rates of planned cesarean breech delivery have continued to increase.²³ In the Netherlands, the cesarean section delivery rate for term breech deliveries quickly rose from 50% to 80% following the publication of the Term Breech Trial, resulting in improved neonatal outcomes.²⁴ Better neonatal outcomes were also reported in a Danish cohort study that revealed an increase in planned cesarean section deliveries from 55.5% to 73.0% for term breech fetuses and a decrease in intrapartum or early neonatal mortality from 0.13% to 0.05%.²⁵ In this study, the most common type of fetal malpresentation during labor was breech (45.3%) and OPO (44.7%). The majority (87.3%) of the women delivered by cesarean section, and 12.7% of the women in the full sample delivered vaginally. Previous work has considered whether decreasing the already

very low perinatal mortality rate justifies increasing cesarean section delivery rates.²⁵ A previous report describing maternal death after cesarean section delivery and neonatal death after unplanned home delivery also examined cesarean section delivery in a system that did not offer the option of vaginal delivery in cases of breech presentation, even in very favorable circumstances.²⁶ Vaginal breech delivery has not been completely eliminated, as seen in a Canadian study that presented a low but increasing vaginal delivery rate in cases of breech presentation, from 2.7% of breech deliveries in 2003 to 3.9% in 2011.²⁷ In Finland, vaginal breech delivery has been reported to be 0.6%–0.7% of all deliveries, 1987–2016.²⁸ Patients in transverse lie should not be allowed to labor because of uterine rupture or cord prolapse risks.²⁹ In the current study, 95% of the women with transverse lie delivered by emergency cesarean section, compared with 71.7% of the women in the full sample ($P < 0.001$). Cases of transverse lie fetal position constituted 6.7% of the cesarean section deliveries in the present study. We found that 75 of the neonates (25%) were admitted to the NICU, and more than two-thirds (69.3%) stayed in the NICU for 2–4 days. Birth asphyxia related to fetal malposition because of difficult labor was the cause of admission to the NICU for

Table 6: Death rate by fetal presentation type.

	Alive		Early neonatal death		Total		P value
	No.	(%)	No.	(%)	No.	(%)	
POP [†]	131	(97.8)	3	(2.2)	134	(100.0)	
Breech	136	(100.0)	0	(0.0)	136	(100.0)	
Transverse	20	(100.0)	0	(0.0)	20	(100.0)	0.360*
Face	3	(100.0)	0	(0.0)	3	(100.0)	
Brow	7	(100.0)	0	(0.0)	7	(100.0)	
Total	297	(99.0)	3	(1.0)	300	(100.0)	

[†]Occipito-posterior or occipito-transverse. *Fisher's exact test.

most of these neonates. After NICU admission, in many cases, jaundice developed because of prematurity or ABO incompatibility. No women who delivered vaginally died, and one neonate (0.5%) died following an elective cesarean section for a primiparous mother with diabetes who had uncontrolled blood glucose. After several hours of labor, this woman had a live birth with a congenital malformation; the infant died after admission to the NICU. Two neonates (4.3%) died following an elective cesarean section delivery. One of these infants had achondroplasia with multiple congenital malformation, and the other infant had hydrocephalus and spina bifida. Both died after 24 to 48 hours in the NICU. In terms of maternal outcomes, 11.3% of the women developed PPH, which was always caused by uterine atony. The main limitation of this study is the short study duration of 6 months. The major strength of the study is that it is the first published report on women who delivered with all types of fetal malpresentation and malposition to determine the rates of these conditions and prenatal and maternal outcomes.

Conclusion

Fetal malpresentation and malposition were not uncommon during labor in our hospital, and most cases are delivered by cesarean section. Neonatal morbidity and mortality are dependent on the type of presentation and the mode of delivery.

Competing interests

The authors declare no competing interests.

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