

Malpresentations: An Observational Study on Prevalence and Feto-Maternal Outcome in A Tertiary Care CenterTsetan Dolma¹, Aakanksha Mahajan^{2*}, Reema Khajuria³¹Post Graduate Student, Department of Obstetrics and Gynaecology, S.M.G.S. Hospital, G.M.C. Jammu²Senior Resident, Department of Obstetrics and Gynaecology, S.M.G.S. Hospital, G.M.C. Jammu³Professor and Head of Department, Department of Obstetrics and Gynaecology, S.M.G.S. Hospital, G.M.C. Jammu

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Conflict of interest: Nil

Abstract:**Background:** Malpresentation is defined as when the presenting part of fetus is other than normal vertex of fetal head.**Aims and Objectives:** To study the prevalence of various malpresentations, mode of delivery, complications and feto-maternal outcome.**Material and Methods:** This hospital based prospective observational study was conducted in Department of Obstetrics and Gynaecology, SMGS Hospital, Government Medical College Jammu from 1st of November 2021 to 31st of October 2022. All the indoor patients in SMGS Hospital with malpresentations were included. Patients were observed for mode of delivery, maternal and fetal outcomes and prevalence of malpresentation calculated.**Results:** The prevalence of patients with malpresentations was 0.87%. Mean age was 26.5±5.04 years. There was a predominance of primigravida patients (54.9 %) and majority were term (77.2%). 92.1% had breech presentation, 3.3% had transverse lie, 2.3% had face presentation, 1.4% had brow presentation, and 0.9% had compound presentation. Out of all the patients with malpresentations, 70.2% had LSCS and 29.8% had vaginal delivery. Feto-maternal outcome was also assessed where most common complication was found to be postpartum haemorrhage (10.7 %) followed by stitch line soakage (5.6 %). We observed that 40.6% of neonates with vaginal delivery had apgar score < 7 at one minute, while only 3.3% of patient with LSCS had apgar score <7 at one minute which is statically significant(P= <0.001). 20.5% neonates needed NICU admission with neonatal mortality rate of 5.1%.**Conclusion:** Malpresentations require a careful obstetrical examination for diagnosis and management. Delivery should always be planned to decrease maternal and perinatal morbidity and mortality.**Keywords:** Malpresentation, Fetus, Labour, Maternal fetal outcome.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Labor is the process that leads to childbirth. It begins with the onset of regular uterine contractions and ends with delivery of the newborn and expulsion of the placenta [1]. The normal mechanism of labour involves a well flexed fetal head that engages into maternal pelvis so that the occiput comes to lie near one of the lateral aspects of maternal pelvis at the onset of labour. As labour advances, progressive flexion and descent of fetal head cause the occiput to rotate anteriorly when the head reaches the pelvic floor. When this sequence of changes in the position of fetal head is altered, a malposition or malpresentation occurs. Malpresentations are an important cause of dystocia i.e; difficult labour. A fetus must pass through the mother's bony pelvis for labour to end properly [2]. A normal presentation is when a fetus

at term presents by the vertex during labour, which occurs in around 95% of cases. The two parietal eminences, the anterior fontanelle and the posterior fontanelle, form the diamond-shaped vertex. It exposes the fetal head's smallest diameters to the mother's pelvis. About 90% of the time during the late first stage of labour at term, the vertex takes the occipitoanterior (OA either right, left, or direct) position, which is regarded as a normal position. The prevalence of malpresentations has decreased in contemporary times as women prefer to have fewer children because many malpresentations are linked to high parity. Most fetal head malpositions or malpresentations are discovered during labour. Vaginal deliveries are feasible in many situations, but they are often accompanied by difficult labour

and more surgical procedures, which come with hazards for both the mother and the infant.

Aims and objectives

- To study the prevalence of various malpresentations.
- To study the modes of delivery for various malpresentations.
- To study the Complications of labor in malpresentations.
- To study Maternal and fetal outcomes.

Material and methods

This hospital based prospective observational study was conducted in Department of Obstetrics and Gynaecology, SMGS Hospital, Government Medical College Jammu after taking clearance from institutional Ethical committee.

All the indoor patients in SMGS Hospital with malpresentations were included. Written and informed consent was taken from all patients and data was recorded over one year i.e. 1st of November 2021 to 31st of October 2022. All the cases with malpresentations that were admitted in

labour room during the study period and those that fulfilled the inclusion criteria were included in the study. Detailed medical history was taken and general physical examination was performed.

Obstetric examination including per abdomen and per vaginal (p/v) to confirm malpresentation was done. Patients were observed for mode of delivery, maternal and fetal outcomes and prevalence of malpresentation calculated.

Inclusion criteria

- All those presented with various malpresentations
- Gestation age >28 weeks.
- Singleton pregnancy

Exclusion criteria

- Gestational age <28 weeks.
- Twin Pregnancy/Multiple Pregnancy.

Results

Out of 24822 deliveries during 12 months of study period, 215 had malpresentations. Figure 1 shows the prevalence of malpresentations.

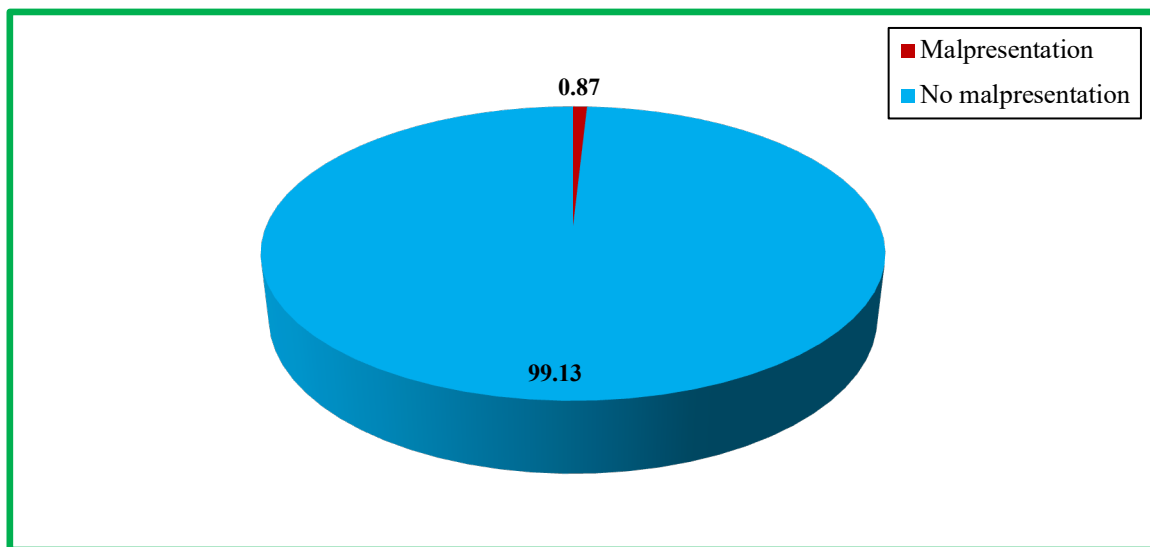


Figure 1: Prevalence of malpresentations among study patients

Table 1: Age distribution of study patients

Age (Years)	Number	Percentage (%)
20-24 Years	83	38.6
25-29 Years	80	37.2
30-34 Years	33	15.3
≥ 35 Years	19	8.8
Total	215	100

We observe that with a mean age of 26.5±5.04 years, the age of studied patients was ranging from 20 to 40 years. The majority of patients (38.6%) were belonging to the age group of 20-24 years (Table 1).

Table 2: Parity wise distribution of patients in our study

Parity	Number	Percentage (%)
Multigravida	97	45.1
Primigravida	118	54.9
Total	215	100

We observed that there was a predominance of primigravida patients, followed by multigravida patients (54.9% vs. 45.1%) (Table 2)

Table 3: Distribution of study patients as per gestational age at the time of delivery

Gestational age	Number	Percentage (%)
< 37 Weeks	49	22.8
≥ 37 Weeks	166	77.2
Total	215	100

Out of 215 patients, 22.8% patients had preterm deliveries compared to 77.2% with full term deliveries.

Table 4: Underlying comorbidities among study patients

Comorbidity	Number	Percentage
Hypothyroidism	60	27.9
IHCP	41	19.1
Gestational hypertension	24	11.2
GDM	18	8.4
Diabetes mellitus	5	2.3
Seizure disorder	3	1.4

We observe that majority of patients 27.9% had hypothyroidism as underlying comorbidity, followed by 19.1% with IHCP (Intrahepatic cholestasis of pregnancy) (Table 4). In our study the past history of malpresentation was evident in 3.7% patients and absent in 96.3% patients. In our study out of 215 patients with malpresentations, 92.1% had breech presentation, 3.3% had transverse lie, 2.3% had face presentation, 1.4% had brow presentation, and 0.9% had compound presentation (Fig 2).

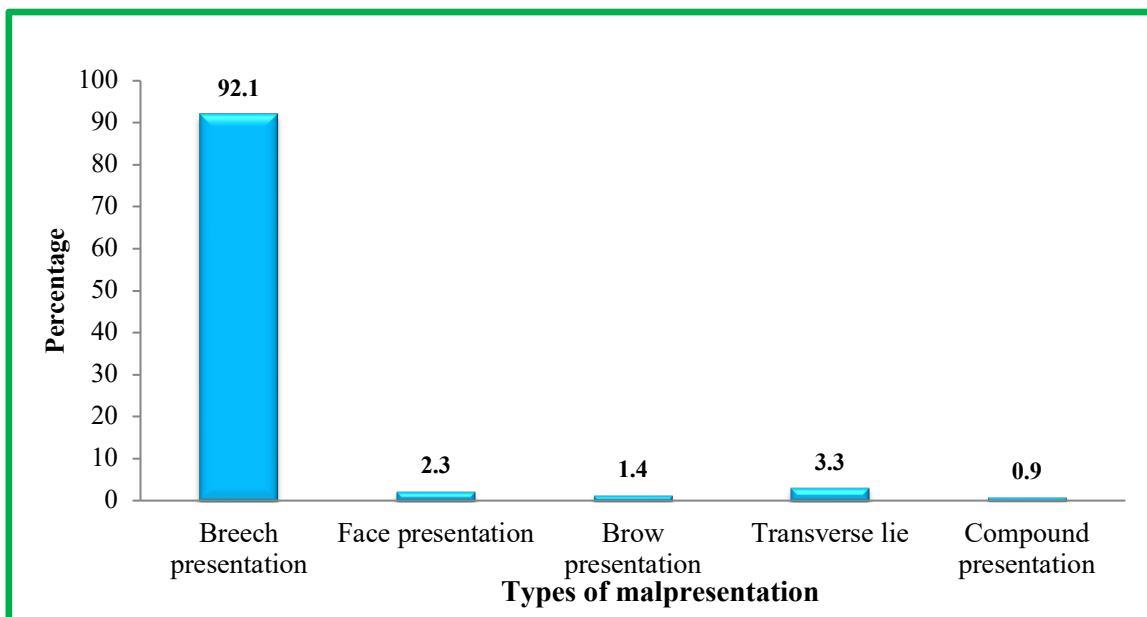


Figure 2: Distribution as per types of malpresentations

Out of 198 patients with breech presentation, 51.5% were complete breech, followed by 38.4% with frank breech and 10.1% with footing breech presentation.

Table 5: Mode of delivery among study patients

Mode of delivery	Number	Percentage
LSCS	151	70.2
Vaginal delivery	64	29.8
Total	215	100

In our study out of 215 patients with malpresentation, 70.2% had LSCS and 29.8% had undergone vaginal delivery.

Table 6: Maternal morbidity among study patients

Maternal morbidity	Number	Percentage
Postpartum hemorrhage	23	10.7
Postoperative stitch line soakage	12	5.6
Postoperative ileus	5	2.3
Puerperal sepsis	3	1.4
Postpartum psychosis	1	0.5

When the maternal morbidity among studied subjects was assessed, we found that 10.7% patients had postpartum hemorrhage, followed by 5.6% with postoperative stitch line soakage, 2.3% with postoperative ileus, 1.4% had puerperal sepsis, and 0.5% had postpartum psychosis (Table 6).

While assessing the neonatal morbidity, we observed that 85.6% patients had 1 minute APGAR score of ≥ 7 and 14.4% had < 7 .

The five minute APGAR score of < 7 was observed in 10.7% and 89.3% had 5 minute APGAR score of ≥ 7 (Fig 3).

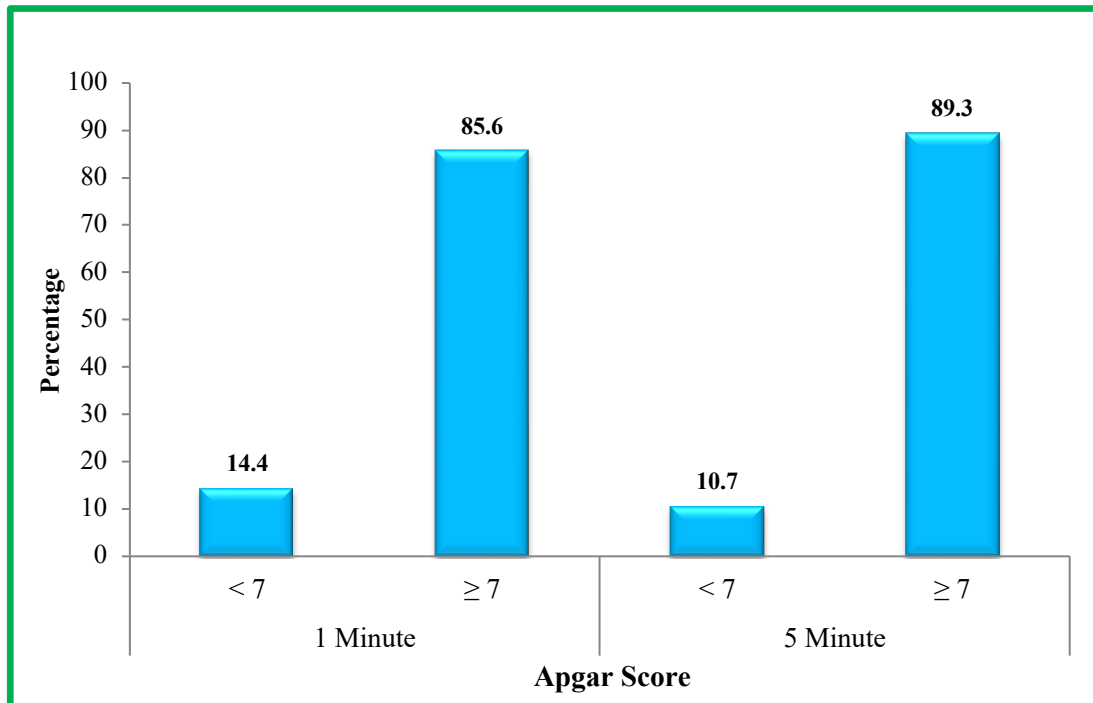


Figure 3: Apgar score at 1 and 5 minutes among study neonates

Table 7: Apgar score as per mode of delivery

Apgar score		LSCS		Vaginal Delivery		P-value
		No.	%age	No.	%age	
1 Minute	< 7	5	3.3	26	40.6	<0.001*
	≥ 7	146	96.7	38	59.4	
5 Minute	< 7	1	0.7	22	34.4	<0.001*
	≥ 7	150	99.3	42	65.6	

*Statistically Significant Difference (P-value<0.05).

In our study out of 64 vaginal deliveries 26 (40.6%) had apgar score of less than 7, while 38 (59.4%) had apgar score of ≥ 7 at one minute. Out of 151 patients with LSCS, 5 (3.3%) had apgar score of less than 7 and 146 (96.7%) had apgar score of ≥ 7 at one and five minute respectively which is statistically significant as we found (p =<0.001) (Table7).

Table 8: NICU admission among neonates of study population

NICU Admission	Number	Percentage (%)
Yes	44	20.5
No	171	79.5
Total	215	100

In our study out of 215 deliveries of various malpresentation 44 (20.5%) neonates required NICU admission (Table 8). When the neonatal morbidity among studied subjects was evaluated, we found that 15.3% had birth asphyxia, 11.6% had prematurity, 6.5% had LBW, 6% had RDS, 1.4% had Meconium aspiration syndrome, 1.4% had IUGR, 0.9% had IUD and 0.5% had still birth (Fig 4).

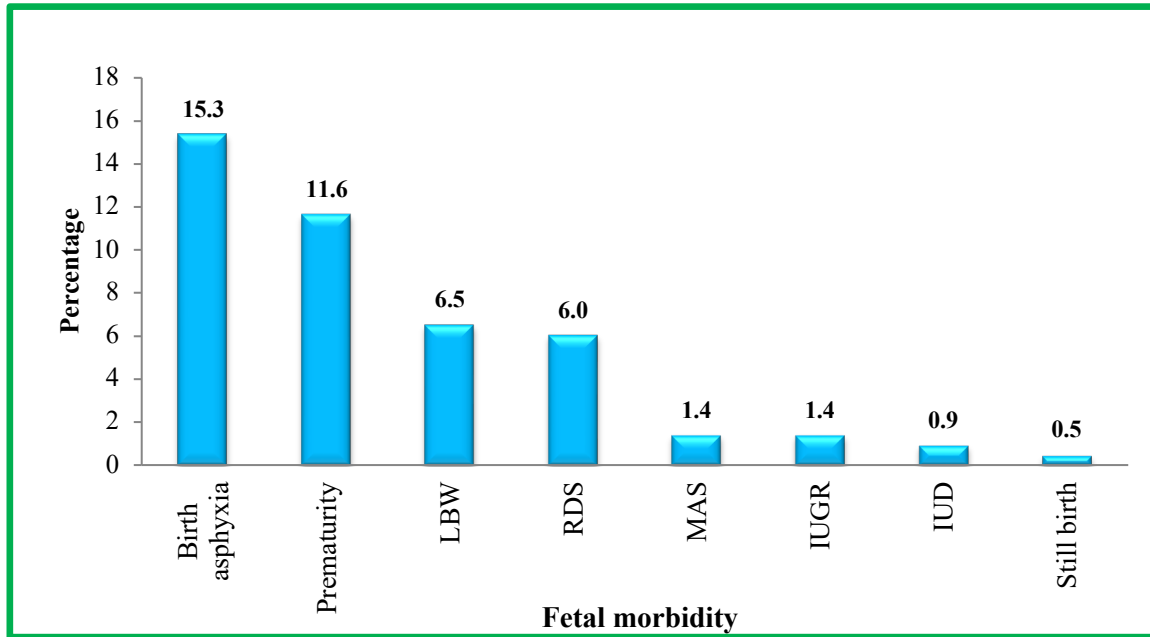


Figure 4: Neonatal morbidity of study patients

We observe that out of 215 patients with malpresentation, 11 had neonatal mortality thus placing the neonatal mortality rate of 5.1%

Discussion

The term "malpresentation" refers to the fetus' abnormal positioning at the time of delivery, such as breech, face, brow, compound, and cord presentation, which increases the risk to both the mother and the fetus' life due to the abnormal course of labour and, in some cases, necessitates a caesarean section. Neglected and improperly handled malpresentation is one of several causes of maternal and neonatal illness and mortality. Out of 24822 deliveries during 12 months of study period, 215 had malpresentations, thus placing a prevalence of 0.87%. In a study by Srivastava et al., 2018 out of 28413 deliveries, 1099 had malpresentations thus placing the incidence rate of 3.87%, which is higher than what we observed [3]. Maskey et al., 2018 in their study reported the incidence of malpresentation as 2.5% [4]. Shruthi et al., 2020 in their study reported that out of 8809 deliveries, 680 were with fetal malpresentation accounting for 7.72% incidence [5]. The variation in the reported incidence rates of malpresentation rate may be attributed to heterogenic study design, ethnic disparity and varying sample size. When the

age distribution of patients with fetal malpresentation was analysed, we found that with an average age of 26.5±5.04 years, the age of studied patients was ranging from 20 to 40 years. The majority of patients 38.6% were belonging to the age group of 20-24 years, followed by 37.7% belonging to the age group of 25-29 years, 15.3% patients belonging to age group of 30-34 years, and 8.8% aging 35 years and above. Maskey et al., 2018 in their study reported that the average age of women with malpresentation was 23.5 years, which is comparable with our study [4].

Malpresentation was more common in primigravida which was 54.9%, followed by multigravida women (45.1%). This might indicate that the patient coming to hospital for deliveries were mostly primigravida. Maskey et al., 2018 in their study also reported that majority of their patients with malpresentation had primigravida status (62%) which is consistent with our study [4]. Henok et al., 2015 reported in their study that malposition and malpresentation was commonest among primigravida (58%) which is compatible with our study [6].

In a study by Tasneen et al., 2019 breech births were more common in primigravida, accounting for 55.1% of all the cases [7]. Compared to

multigravidas, primiparas are not only more likely to have a malpositioned fetus at the onset of labor but are also less likely to achieve spontaneous vaginal delivery with persistent OP position.

In the present study, majority of our patients had full term deliveries compared to preterm deliveries (77.2% vs. 22.8%). In a study by Tasneen et al., 2019 majority of the patients with malpresentation had full term deliveries compared to preterm deliveries (78% vs. 22%), which is much similar to what we observed in the present study[7].

When stratifying maternal outcome for malpresentation by mode of delivery and term/preterm status, only vaginal deliveries and term deliveries remained associated with an increased risk for maternal mortality. When the underlying comorbidities among the studied subjects were assessed, we found that majority of our patients (27.9%) had hypothyroidism, followed by 19.1% with IHCP, 11.2% with gestational hypertension, 8.4% with GDM, 2.3% with diabetes mellitus and 1.4% with seizure disorder as underlying comorbidities.

The most typical form of malpresentation is breech presentation Pilliod et al., 2017, Demol et al., 2000 and Hickok et al., 2015 [8,9,10]. In the present study, out of the 215 patients with malpresentation, 92.1% had breech presentation. This is consistent with numerous studies who have reported that breech malpresentation is the commonest type of malpresentation (4.38%) Tasneen et al., 2019, Shruthi et al., 2020 and Budania S et al., 2017 [7,5,11]. For instance; Tasneen et al., 2019 in their study reported that majority of their patients with malpresentation had breech presentation (86%) [7]. In a study by Shruthi et al., 2020 out of 680 patients with malpresentation, 541 had breech presentation (79.55%) [5]. Our results are also consistent with Maskey et al., 2014 who reported in their study that 82.1% of their patients had breech presentation [4]. About 3% to 4% of deliveries result in a breech presentation, with the prevalence decreasing with increasing gestational age (Hofmeyr et al., 2015) [12]. Fetal variables linked to breech presentation in addition to prematurity include aneuploidy, congenital abnormalities, growth limitation, multiple gestations, and female fetal sex (Hofmeyr et al., 2015) [12].

In the present study, we observed that 3.3% had transverse lie, which is slightly lower compared to 8.4% and 14.81% as reported by Tasneen et al., 2019, and Shruthi et al., 2020 respectively [7,5]. About 0.03% of deliveries are affected by oblique and transverse lies, which frequently cause the deepest presenting region to be the fetal shoulder (Pilloid et al., 2017) [8]. Leopold manoeuvre and ultrasound examination are used to make the diagnosis. We observed that (2.3%) of our patients had face presentation, 1.4% had brow malpresentation, and 0.9% had compound

presentation, which is compatible with Tasneen et al., who reported that 4.3% of their patients had face malpresentation, 1.3% had brow presentation and 0.5% with compound presentation. Shruthi et al., 2020 in their study found that 3.67% had face malpresentation, 0.58% had brow malpresentation, and 1.76% had compound malpresentation, which is consistent with the results of present study[5]. Face and brow presentations happen when the fetus is cephalic presentation, but the fetal neck is stretched enough that the vertex isn't presenting. With an incidence of 0.1% to 0.2% of all deliveries, face and brow presentations are relatively uncommon. They are linked to null parity, cephalopelvic disproportion, black race or ethnicity, prematurity, fetal growth disorders (including both low birth weight and fetal macrosomia), and fetal anomalies Bashiri et al., 2008 and Shaffer et al., 2011 [13,14].

Compound presentation refers to a fetus that presents with an extremity that comes before or next to the fetal head. A compound presentation affects 0.1% to 0.2% of deliveries, most frequently a hand or arm Breen et al., 1968 and Goplerud et al., 1953 [15,16]. On the basis of a digital vaginal exam and the palpation of the concerned extremities, a diagnosis is made. Prematurity, low birth weight, large levels of amniotic fluid (polyhydramnios), and multiple gestations have been reported to be linked with compound presentation Breen et al., 1968 and Goplerud et al., 1953.

Frank breech, full breech, and footing breech are three further classifications for the most prevalent type of malpresentation breech, which is determined by how the fetus is positioned in relation to the mother's pelvis. Out of 198 patients with breech presentation, 51.5% were complete breech, followed by 38.4% with frank breech and 10.1% with footing breech presentation. In a study by Tasneen et al., 2019. Majority of their patients had complete breech classification (49%), followed by 41% with frank breech and 10% with footing presentation; this is much similar to what we observed [7].

Planning a woman's delivery when her fetus is in breech presentation is primarily concerned with decreasing perinatal morbidity and mortality. The Term Breech Trial, a global randomised controlled trial that was published in 2000, serves as the basis for current practice M E Hannah et al., 2000 [18]. The Term Breech Trial randomly assigned complete and frank presenting fetuses to planned vaginal or planned caesarean birth.

In the present study, out of the 215 patients with malpresentation, 70.2% had LSCS and 29.8% had vaginal delivery. Tasneen et al., 2019 in their study reported that out of 161 patients with complete breech presentation, 52% had LSCS, and 48% had vaginal delivery, and of the 133 cases with frank

breech presentation 65% had LSCS and 34% delivered vaginally [7]. In a study by Maskey et al., 2014 the most common mode of delivery was caesarian section i.e. 84.2%, followed by assisted vaginal delivery (15.8%) which is compatible with our study [4]. The incidence of breech vaginal birth is lower in the current study when compared to a CS rate, which is similar with Nordin et al., 2006 and Maskey et al., 2014, Ghosh et al., 2005 and Hofmeyr et al., 2015 [18,4,19,12].

Hannah et al., 2000 reported in their study that perinatal mortality, neonatal mortality, and serious neonatal morbidity were lower in women with a planned cesarean delivery (relative risk 0.33, 95% confidence interval 0.19–0.59; $P < 0.0001^*$) [17]. When the maternal morbidity among studied subjects was assessed, we found that 10.7% patients had postpartum hemorrhage, followed by 5.6% with postoperative stitch line soakage, 2.3% with postoperative ileus, 1.4% puerperal sepsis, and 0.5% with postpartum psychosis. According to Shruthi et al., 2020 the most frequent complications among women who had a malpresentation were obstructed labour (6.9%), postpartum haemorrhage (3.67%), cervical tear (0.88%), perineal tears (0.73%), para urethral tear (0.58%), puerperal sepsis (0.44%), post LSCS wound sepsis (0.73%), and uterus rupture (0.14%) [5]. Duffy et al., 2019 in their study reported that malpresentation was associated with increased maternal morbidity, particularly postpartum haemorrhage, which is consistent with our study [20].

The Apgar score is the most often used indicator of neonatal health in the first few minutes following delivery, giving labour ward staff a common knowledge of a newborn's state and the potential need for and responsiveness to resuscitation. Within the first ten minutes of birth, the examination is typically performed several times, typically at 1, 5, and 10 minutes. We observed that 85.6% patients had 1 minute APGAR score of ≥ 7 and 14.4% had < 7 . The five minute APGAR score of < 7 was observed in 10.7% and 89.3% had 5 minute APGAR score of ≥ 7 . Evidently, majority of neonates had an APGAR score of > 7 indicating a stable health status of neonates, with the result only 20.5% needed NICU admission.

A study by Tasneen et al., 2019 found that 24.4% of their patients required admission to the NICU, which is consistent with the 20.5% rate of NICU admission found in the current study [7]. In another study by Ali et al., 2011. 26% patients were shifted to NICU after emergency LSCS, which is also consistent with our study [21]. Barrowclough et al., 2022, Fitzpatrick et al., 2001 and Phipps et al., 2014 in their study reported that neonatal outcomes were similar in women with a fetal malpresentation compared to women with no malpresentation, which is consistent with our study in which low NICU admission rate was observed [22,23,24]. However; some studies have reported

adverse neonatal outcomes associated with persistent fetal malposition in the second stage of labour including NICU admission, birth injury, Apgar score < 7 at 5 minutes and low cord pH Cheng et al., 2006, Liljestrom et al., 2018 and Dahlqvist et al., 2017 [25,26,27].

When the fetal morbidity among studied subjects was evaluated, we found that 15.3% had birth asphyxia, 11.6% had prematurity, 6.5% had LBW, 6% had RDS, 1.4% had MAS, 1.4% had IUGR. 0.9% had IUD and 0.5% had still births and 11 neonates died with a mortality rate of 5.1%. Evidently, birth asphyxia was the commonest of all the fetal morbidities observed in the presently study, which is consistent with the study of Dabalo et al., 2021. who reported that neonates born with malpresentation were 4.1 times more likely to develop birth asphyxia compared with newborns delivered with vertex presentation (AOR = 4.06, 95% CI = 2.08-7.94) [28]. Maskey et al., 2014 in their study reported that out of 108 births among malpresentations, 10% had birth asphyxia, 4.9% had IUFD, 3.84% had congenital anomaly and 10 neonates died thus placing the fetal mortality rate of 10.9%, which is comparable with our study [4].

All these studies demonstrate that timely delivery with good early fetal outcome can be accomplished with appropriate care and a suitable mode of delivery, which can result in optimal neonatal outcome.

Conclusion

The present study demonstrated that malpresentations were prevalent in 0.87% of cases. Patients who were primigravida predominated, and breech presentation was the most common type of malpresentation. Most of the patients had a complete breech presentation, which was followed by a frank presentation. Our study revealed that there were minimal fetomaternal complications suggesting that good early fetal outcome can be accomplished with appropriate care and a suitable mode of delivery.

The provision of quality prenatal care is the cornerstone of effective management of malpresentations. Early detection during the prenatal stage can optimize the result for both the mother and the fetus. However; delivery should always take place in a hospital setting with well-equipped caesarean facilities and NICU facilities.

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