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CLINICAL STUDY OF LABOUR OUTCOME IN VARIOUS MALPRESENTATION

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ABSTRACT

Foetal malpresentation has the significant incidence in the lower- and middle-income countries (LMIC). The malpresentation leads to increase probability of operative delivery, also determine the maternal and foetal outcomes. We conducted the study with an objective to identify the various types of malpresentations and associated factors for it and incidence of abnormal labour due to misrepresentation. And the aim of the study is to assess the maternal and foetal outcomes in various malpresentation during labour. We conducted the prospective cohort study in the tertiary care hospital in Marathwada region. We estimated the incidence of different types of malpresentation and associated maternal and foetal outcomes. The study findings depicted that breach presentation is observed in 77 (70%) of the patients while the transverse presentation is observed in 21 (19.09%) of patients. The study also illustrated that around 64 (58.18%) of patients undergone caesarean section, while 14 (12.73%) patients experienced atonic postpartum haemorrhage (PPH). While in terms of perinatal outcome study demonstrated that 21 (17.35%) of foetus needed NICU admission >24 hrs while around 15 (12.40%) foetus shows Apgar score <7 at 5 minutes. The study concluded that early detection of malpresentation and its potential cause, as well as prompt referral from a peripheral health centre to an institution with all necessary resources should be provided.

INTRODUCTION

Foetal malpresentation is refers when the foetal part other than head is engaged with maternal pelvis. The malpresentation includes breech presentation, transverse and oblique lie with shoulder presentation, face and brow presentation, and compound presentation.[1] While foetal malposition includes an occiput-posterior (OP) or occiput-transverse (OT) position in labour.[2] Foetal malpresentation leads to increased probability of operative delivery, progressing to incremental maternal and foetal complications.[3]

The population-based study conducted in the lower- and middle-income countries (LMIC) depicted that the 2% incidence of malpresentation.[4] The evidence from developed countries showcased that there is no inherent risk for malpresentation. The study also advocates for the need to identify pregnancies which are complicated by malpresentation and standardization of care. Streamlining of these practices leads to significant reduction in maternal and foetal complications.[5]

There are many studies conducted to identify the causes of malpresentation and its maternal and foetal outcomes. Major factors that show association with foetal malpresentation are nulliparity, an anterior placenta, pelvic shape, epidural use, increased body mass index, advanced maternal age and foetal macrosomia.[6]

Persistent foetal malpresentation is major cause of adverse maternal health outcomes including operative vaginal birth, caesarean section, postpartum haemorrhage, endometritis, chorioamnionitis, severe perineal injury and anal sphincter injury.[7] However, in neonates it leads to admission in intensive care unit (NICU), birth injury including subgalea haematoma, and hypoxic ischaemic encephalopathy.[7]

This study has an objective to identify the various types of malpresentations and associated factors for it and incidence of abnormal labour due to misrepresentation. And the aim of the study is to assess the maternal and foetal outcomes in various malpresentation during labour.

MATERIAL AND METHOD

A prospective cohort study was conducted in tertiary care centre in the Marathwada region of Maharashtra state. Women with >18 years of age presented at the labour ward of hospital with abnormal labour due to foetal malpresentations were included. However, all the patients with normal labour were excluded from the study.

After obtaining consent and satisfying inclusion and exclusion criteria, patients were enrolled in the study. All cases of abnormal labour due to malpresentations

admitted in labour ward were analysed as regard to age, parity, gestational age, foetal presentation causing abnormal labour, complication due to abnormal labour, mode of delivery, birth weight, need for induction of labour, regional analgesia, need for episiotomy, perineal trauma, need for caesarean section or Piper forceps application, intraoperative complications and post-operative outcome.

Clinical and laboratory finding were obtained from each case. Electronic foetal monitoring was done throughout the entire labour. Data was collected in pre-structured proforma which was pilot tested and after ensuring it's validity. The data collected was then analysed by appropriate test of significance. Primary outcomes were nanocephalic vaginal birth, caesarean section, Apgar score less than seven at one and five minutes, Poor perinatal outcomes like birth trauma, still birth, NICU admission >24 hours and Poor Maternal outcomes like PPH, puerperal sepsis, cervical tear, perineal tear, post LSCS wound sepsis or other serious maternal morbidity.

The foetal outcome was measured in terms of incidence of birth trauma. Birth trauma was defined as subdural hematoma, intra-cerebral or intra-ventricular haemorrhage, spinal-cord injury, basal skull fracture, clinically significant genital injury, brachial plexus injury, humerus or clavicle fracture.

Statistical analysis is done using the SPSS version 2.0. Analysis of qualitative data is done with frequency distribution and estimation of p value with chi square test. While for the quantitative data mean and standard deviation estimation is done, and statistical significance is sought using t test.
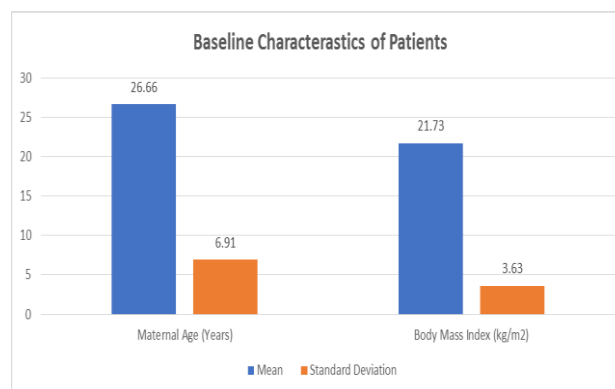
RESULT
The prospective observations study conducted in the OBGY department of the tertiary care hospital enrolled 110 cases of abnormal labour due to foetal malpresentation. All of these patients were following up during the study period, so all 110 patients were included in the final analysis. The study results are depicted in terms of the.

In terms of demographic parameters, mean age of the patients was 26.66 ± 6.91 years. In the present study, the mean BMI of the patients was 21.73 ± 3.63 kg/m^2. When the type of malpresentation is compared with the age group, the significant association is seen in only for age group 38-47 years (p <0.001). However, there was no significant correlation between other age groups and malpresentation. In the present study, only BMI category of >25 was significantly associated with transverse lie (p=0.02) while other BMI categories i.e., <18.5, 18.-22.99 & 23-24.99 were not significantly associated with any specific type of malpresentation (p>0.05). *(Refer Supplementary Table No 1. Correlation Factor)*

Table No. 1: Baseline characteristics of patients.

| Baseline Characteristics of the patients (N=110)	
Characteristics	**Mean ± SD**
Maternal Age	26.66 ± 6.91 years.
Body Mass Index	21.73 ± 3.63

Graph no. 1: Baseline characteristics of patients.

The study results illustrated that, most common risk factors for malpresentations were Pre-term premature rupture of membrane (PPRM) which was present among 45 (40.9%) patients, followed by Small for gestational age (27.27%). Placenta previa (10%), Multiple gestation (10%), Previous breech (9.09%) and Congenital foetal anomaly (2.73%) were the other risk factors identified by the study. In the present study, amongst risk factors, Multiple gestation was significantly associated with transverse lie (p=0.0003) and SGA (p=0.007) was significantly associated with brow presentation while other risk factors i.e., Congenital foetal anomaly, History of Previous Breech, Placenta previa & PPRM were not significantly associated with any specific type of malpresentation (p>0.05). *(Refer Supplementary Table No 1. Correlation Factor)*

Table no. 2: Risk factors in patients.

| Risk factors in the patients (N=110)		
Risk Factors	Frequency	Percentage
Congenital foetal anomaly	03	02.73
Previous breech	10	09.09
Multiple gestation	11	10
Placenta previa	11	10
PPRM	45	40.9
SGA	30	27.27
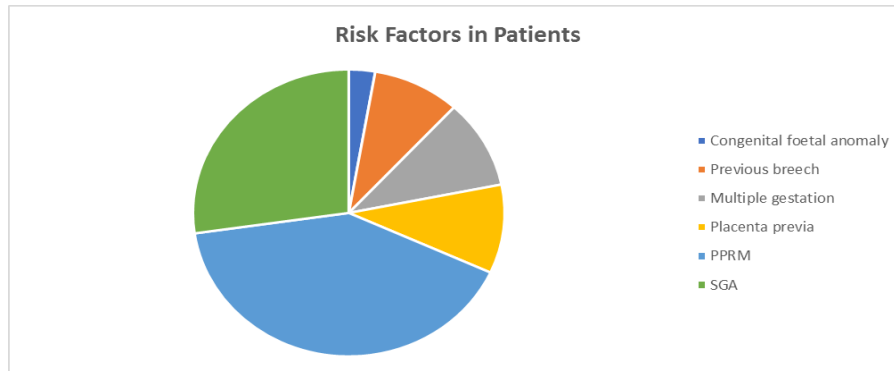
Graph no. 2: Risk factors in patients.

The patients were also analysed depending upon the presenting complaints. The study shows that leaking per vaginal is (PV) is most reported 45 (40.9%) presenting complaints by patients, while the prolapse of foot (2.73%) is least reported presenting complaint.

Table no. 3: Complaints in patients.

| Complaints in patients (N= 110)		
Complaints	Frequency	Percentage
PV bleeding	14	12.72
Leaking PV	45	40.90
Pain in abdomen	27	24.54
Prolapse of foot	03	02.73
Reduced foetal movements	40	36.36
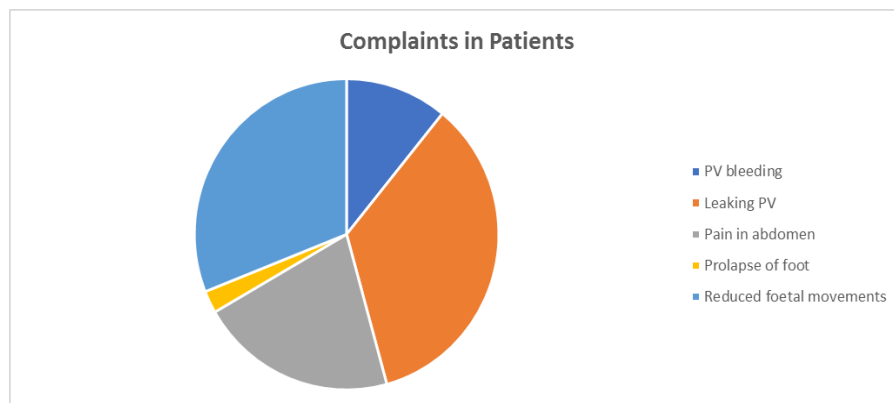
Graph no. 3: Complaints in patients.

In terms of malpresentation, study analysed that the breech presentation 77 (70%) is most common malpresentation in patients followed by transverse lie in 21 (19.09%) patients. While around 4.54% of patients showed compound presentation and brow & face presentation was present in 3.64% and 2.73% patients. *(Refer Supplementary Table No 1. Correlation Factor)*

Table no. 4: Malpresentation in patients.

| Malpresentation in the patients (N =110)		
Malpresentation	**Frequency**	**Percentage**
Breech	77	70
Transverse	21	19.09
Face	03	02.73
Brow	04	03.64
Compound	05	04.54
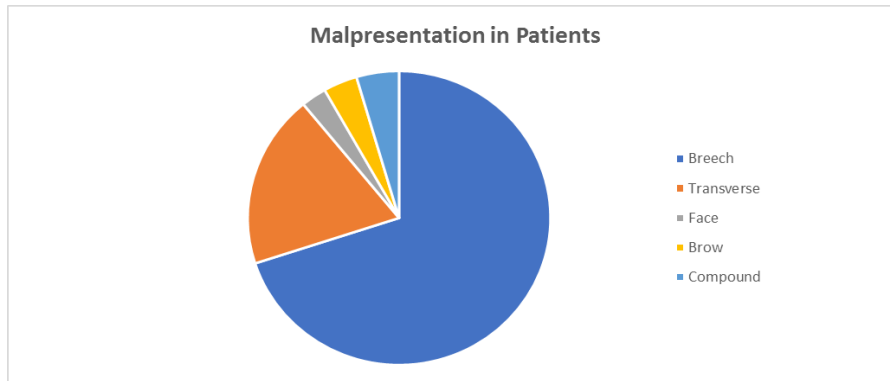
Graph no. 4: Malpresentation in patients.

The study results observed that around 58.18% of patients undergone Caesarean section. While the instrumentation was required in 20 patients and in 23.64% of patients undergone normal vaginal delivery. In the present study, vaginal delivery was significantly associated with breech presentation (p=0.02),

Instrumental delivery was significantly associated with brow presentation (p=0.04) and Caesarean delivery was significantly associated with transverse or compound presentation (p<0.001). *(Refer Supplementary Table No 1. Correlation Factor)*

Table no. 5: Mode of delivery.

| Mode of delivery in the patients (N=110)		
Mode of delivery	**Frequency**	**Percentage (%)**
Vaginal	26	23.64
Instrumental	20	18.18
Caesarean section	64	58.18
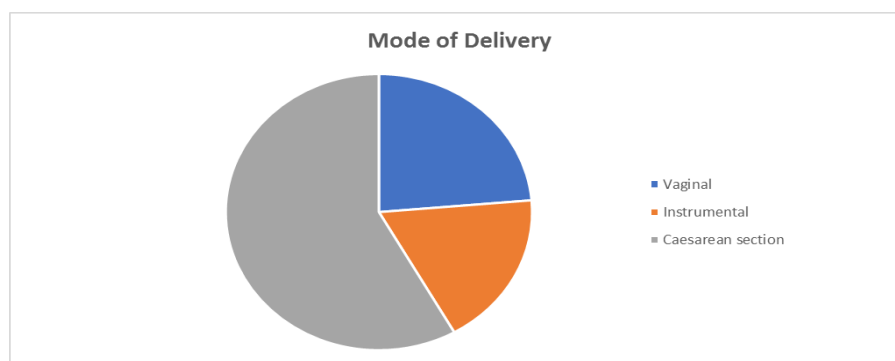
Graph no. 5: Mode of delivery.

Our study also tried to understand the maternal outcome of malpresentation. The study data after the analysis showed that Atonic post-partum haemorrhage (PPH) is the most common maternal outcome. It is seen in 12.73%[14] patients. While the perineal tear (3.64%) and Post LSCS wound sepsis (0.9%) are least occurred maternal complications. In the present study, amongst various maternal outcomes, paraurethral tear was

significantly associated with brow presentation (p=0.001), also Puerperal sepsis was significantly associated with brow presentation (p<0.05) while other maternal outcomes i.e., Atonic PPH, cervical tear, Perineal tear & Post LSCS wound sepsis were not significantly associated with any specific type of malpresentation (p>0.05). *(Refer Supplementary Table No 1. Correlation Factor)*

Table no. 6: Maternal outcome.

| Maternal Outcome (N=110)		
Maternal outcome	Frequency	Percentage (%)
Atonic PPH	14	12.73
Cervical tear	07	06.36
Paraurethral tear	04	03.64
Perineal tear	03	02.73
Puerperal sepsis	09	08.18
Post LSCS wound sepsis	01	0.9
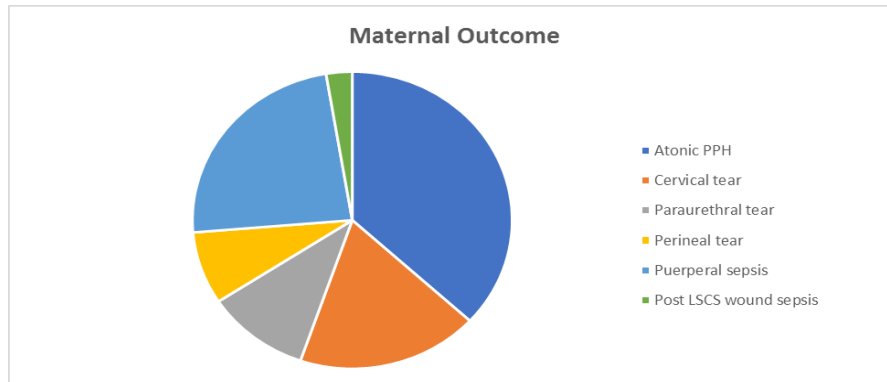
Graph no. 6: Maternal outcome.

In the present study, most common perinatal outcome of malpresentations was NICU admission in 21 (17.35%) patients, followed by Apgar score <7 at 5 minutes in 15 (12.40%) patients, Perinatal death in 9 (7.44%), Birth trauma in 5 (4.13%) & Birth asphyxia in 3 (2.48%). In the present study, amongst various perinatal outcomes, NICU admission >24 hour & Apgar score <7 at 5 minutes was significantly associated with brow presentation (p<0.05), while Perinatal death & Birth trauma were significantly associated with face presentation (p<0.05). Birth asphyxia was not significantly associated with any specific type of malpresentation (p>0.05). *(Refer Supplementary Table No 1. Correlation Factor)*

Table no. 7: Perinatal outcome.

Perinatal Outcome (N=110)		
NICU admission >24 hrs.	21	17.35
Birth asphyxia	03	02.48
Birth trauma	05	04.13
Apgar score <7 at 5 minutes	15	12.40
Perinatal death	09	07.44
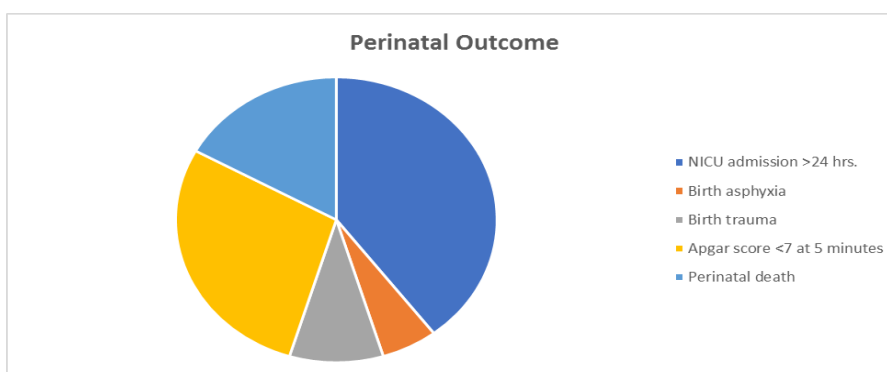
Graph no. 7: Perinatal outcome.

DISCUSSION

Despite being a natural process, labour frequently enters an aberrant state as a result of different misrepresentations. Malpresentation must be found before labour begins in order to reduce the risk to the mother's unborn child from complications and caesarean section. For obstetric care to be effective, accurate assessment of the foetal malpresentation and position is

essential. Breech is the most prevalent malpresentation among the others, which also include transverse lie, brow, and compound. These malpresentations raise the risk to the mother and the foetus because of the abnormal labour. There are several reasons of maternal and perinatal illness and mortality, and malpresentation is being overlooked and poorly handled. For a successful foetal and maternal result, malpresentation constitutes a unique high-risk category for which proper case management is essential.

The current study discovered that the most common age group of patients is 28 to 37 years old, followed by 18-27 years old. The patients' average age was 26.66 + 6.91 years. Age, on the other hand, has no bearing on the outcome of malpresentation. In the current study, the majority (33.64%) of the patients had a BMI of 23-24.99 kg/m^2, 29.09% had a BMI of 18.5-22.99 kg/m^2, and 26.37% had a BMI of 18.5 kg/m^2.

Leaking PV was the most frequent presenting complaint in our study, with 40.9% of patients reporting it, followed by decreased foetal movements (36.36%), abdominal pain (24.54%), pv bleeding (12.72%), and prolapse of foot (2.73%). This result is consistent with that of TEMPEST et al. This factor could be responsible for a number of intraoperative and postoperative problems.[8]

The majority of deliveries in the current study were by caesarean section (58.18%), followed by vaginal (23.64%) and instrumental (18.18%) methods. Hofmeyr GJ et al[9] and Smitha Joy et al.[10] Vaginal birth was possible in multiparous patients with ZA score assessment in breech presentation. The external cephalic version, which could reduce the need for caesarean procedures, was not explored.

Breech presentation was the most frequent type of malpresentation in our study, affecting 70% of patients, followed by transverse lies, which affected 19.09% of patients, compound presentations (4.54%), brow presentations (3.64%), and face presentations (2.73%). Complete breech was the most frequent kind of breech in the current investigation, occurring in 54 cases (70.13%), followed by frank breech (24.68%) and footling (5.59%). These results concur with those of Scheer K et al.[11] and Hickok DE et al.[12] In the beginning of labour, a full-term primigravida with a mature foetus should be considered for a caesarean section. Consider vaginal delivery in primigravida with preterm & low birth weight with IUFD & 7–8 cm cervical dilation.

In the current study, most common risk factors for malpresentation were Pre-term premature rupture of membrane (PPRM) which was present among 40.9% patients, followed by Small for gestational age (27.27%), Placenta previa (10%), Multiple gestation (10%), Previous breech (9.09%) and Congenital foetal anomaly (2.73%). Similar findings reported by Anna Toijonen et al.[13] J.C.P. Ferreira et al.[14] studied the evolution of presentation during pregnancy and reported that from 22 to 36 weeks of gestation, the prevalence of cephalic presentation increased from 47% to 94%, that might be the reason PPRM could be so frequently associated with malpresentation.

Atonic PPH was the most frequent maternal outcome of malpresentations in the current study, occurring in 14 (12.73%) patients. Puerperal sepsis (8.18%), Cervical tear (6.36%), Paraurethral tear (3.64%), Perineal tear (02.73%), and Post LSCS wound sepsis (0.9%) were the next most frequent maternal outcomes. Fonseca A, et al., Gunay et al.,[15] and M. Mattila et al.[16] all made similar observations. Wound sepsis may have been caused by prolonged PROM, obstructed labour, and prolonged PPROM. Despite a few morbidities, no maternal deaths were discovered.

Perinatal outcome in cases of malpresentation was a minor issue. The most frequent negative perinatal outcome of malpresentation in the current study was NICU hospitalisation (17.35%), followed by Apgar score 7 at 5 minutes (12.40%), perinatal death (7.44%), birth trauma (4.13%), and birth asphyxia (2.48%). Fonseca A, et al., Gunay et al.,[15] and M. Mattila et al.[16] all made similar observations. In the current study, the age range of 38–47 was significantly linked with the compound type of malpresentation (p=0.001), whereas the other two age ranges of 18–27 & 28–37 were not (p>0.05). Growing maternal age may be more frequently linked to a certain sort of malpresentation.

In the present study, amongst various maternal outcomes, Atonic PPH was significantly associated with vaginal mode of delivery (p<0.001), Perineal tear was significantly associated with instrumental mode of delivery (p<0.0009) while other maternal outcomes i.e., Cervical tear, Paraurethral tear & Post LSCS wound sepsis were not significantly associated with any particular mode of delivery (p>0.05). Similar findings noted by T. Gunay et al[15] who had reported that maternal complications were significantly higher with instrumental and vaginal mode of delivery. Caesarean delivery was associated with lowest maternal complications. Contrast finding was noted by GAILLARD et al[17] i.e. Induction of labour for breech presentation does not seem to increase maternal mortality morbidity compared with planned caesarean delivery and Valente et al.[18]

In this study, birth trauma and NICU stay for more than 24 hours were both substantially linked with vaginal delivery (p0.001) and instrumental delivery (p=0.01), respectively. The mean birth weight of the baby was not related to perinatal death in the current study. According to T. Gunay et al.,[15] instrumental and vaginal deliveries resulted in significantly greater rates of perinatal problems. The least number of perinatal problems were linked to caesarean deliveries. Perinatal problems are

much more common with vaginal delivery than with planned caesarean, according to M. Mattila et al,[19] Contrary results were found by GAILLARD et al.[17] who had carried out a secondary analysis of the observational prospective multicenter PREMODA study, namely that planned caesarean delivery versus inducing labour for breech presentation does not appear to increase neonatal mortality or severe neonatal morbidity as perValente et al.[18]

Supplementary material
Table 1: Correlation factors.

Characteristic	Malpresentation					p value
	Breech (n=77)	**Transverse (n=21)**	**Face (n=03)**	**Brow (n=04)**	**Compound (n=05)**	
Age	No (%)	No (%)	No (%)	No (%)	No (%)	
18- 27	31 (40.26)	07 (33.33)	03 (100)	03(75.0)	01(20.0)	0.1
28- 37	42(54.55)	09(42.86)	00(00)	01(25.0)	01(20.0)	0.15
38- 47	04(05.19)	05(26.32)	00(00)	00(00)	03(60.0)	**<0.001**
BMI	No (%)	No (%)	No (%)	No (%)	No (%)	
<18.5	21 (27.28)	03 (14.29)	01 (33.33)	02 (50.0)	01 (20.0)	0.56
18.5- 22.99	27 (35.06)	03 (14.29)	01 (33.33)	01 (25.0)	00 (00)	0.13
23- 24.99	25 (32.47)	08 (38.09)	01 (33.33)	01 (25.0)	03 (60.0)	0.7
>25	04 (05.19)	07 (33.33)	00 (00)	00 (00)	01 (20.0)	**0.02**
Comorbidity	No (%)	No (%)	No (%)	No (%)	No (%)	
DM	04 (05.19)	04(19.05)	00(00)	00(00)	01(20.0)	0.21
PIH	07(09.09)	04(19.05)	00(00)	01(25.0)	02(40.0)	0.19
Leiomyoma	01(01.29)	03(14.29)	00(00)	00(00)	00(00)	**0.02**
Oligohydramnios	15(19.48)	04(19.05)	00(00)	01(25.0)	01(20.0)	0.79
Uterine anomaly	02(02.59)	00(00)	00(00)	00(00)	01(20.0)	0.06
Risk factors	No (%)	No (%)	No (%)	No (%)	No (%)	
Congenital foetal anomaly	00(00)	01(05.26)	01(33.33)	01(25.0)	00(00)	**0.0003**
Previous breech	07(09.09)	01(04.76)	00(00)	00(00)	02(40.0)	0.13
Multiple gestation	02(02.59)	08(38.09)	00(00)	00(00)	01(20)	**0.0003**
Placenta previa	10(12.99)	00(00)	00(00)	01(25.0)	00(00)	0.3
PPRM	28(36.36)	13(61.90)	01(33.33)	01(25.0)	02(40.0)	0.28
SGA	14(18.18)	09(42.86)	02* (66.67)	03* (75.0)	02* (40.0)	**0.01**
Maternal outcome	No (%)	No (%)	No (%)	No (%)	No (%)	
Atonic PPH	12(15.58)	01(04.76)	01(33.33)	00(00)	00(00)	0.21
Cervical tear	03(03.90)	03(14.29)	00(00)	01(25.0)	00(00)	0.11
Paraurethral tear	00(00)	02(09.52)	00(00)	01(25.0)	01(20)	**0.006**
Perineal tear	02(02.60)	01(04.76)	00(00)	00(00)	00(00)	0.95
Puerperal sepsis	01(01.29)	04(19.05)	01(33.33)	02(50.0)	01(20.0)	**<0.001**
Post LSCS wound sepsis	00(00)	01(04.76)	00(00)	00(00)	00(00)	0.36
Perinatal outcome	No (%)	No (%)	No (%)	No (%)	No (%)	
NICU admission >24 hrs.	16(20.78)	00(00)	02(66.67)	03(75.0)	00(00)	**<0.001**
Birth asphyxia	02(02.59)	00(00)	00(00)	01(25.0)	00(00)	0.11
Birth trauma	03(03.90)	00(00)	01(33.33)	01(25.0)	00(00)	**0.01**
Apgar score <7 at 5 minutes	06(07.79)	06(28.57)	01(33.33)	02(50.0)	00(00)	**0.004**
Perinatal death	02(02.59)	06(28.57)	01(33.33)	00(00)	00(00)	**<0.001**

CONCLUSION

Malpresentations are unquestionably linked to an increase in maternal and perinatal problems because of aberrant labour patterns, challenging surgical deliveries, and complications such PPH puerperal sepsis and wound sepsis. Therefore, early detection of malpresentation and its potential cause, as well as prompt referral from a peripheral health centre to an institution with all necessary resources, such as a skilled obstetrician, skilled anaesthetist, blood bank with enough blood supply, well-equipped microbiology lab for culture sensitivity facilities, and access to antibiotics, should be provided.

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