



TO OBSERVE THE LOCALISATION OF PLACENTA IN RELATION TO PREVIOUS CESAREAN SECTION AND IT'S FETO-MATERNAL OUTCOME

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Contribution: Data Collection.

ABSTRACT

Objective:

To observe the localization of placenta in relation to previous cesarean section and its feto-maternal outcome

Materials and method:



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A cross sectional study was conducted among 246 Eligible participants (participants with previous LSCS and current pregnancy ≥ 20 weeks) Detailed history including menstrual history, obstetrics history, past history, personal history, marital history, family history of the patient was taken. General and obstetrical examination were carried out. All women were undergone to transvaginal or transabdominal ultrasound. Determining the placental location or any abnormal placentation with the transabdominal obstetric scan done between 28 weeks period of gestation and 42 weeks period of gestation, reassessed after 36 weeks or when patient presents in labor or with bleeding per vagina. The patients are followed up to delivery and the maternal and fetal outcomes are noted.

RESULTS

The mean age of the study participants was 28.69 years among which 90.7% of the cases were booked History of previous one LSCS was reported among 71.1% of the women while 28.9% were having two LSCS. Placenta previa was observed among 14.2% of the women who had previous history of LSCS. Fundo-posterior and fundo-anterior placenta was seen among 37.8% and 14.6% of the women respectively. Fundo-lateral and low-lying placenta were seen among 24% and 9.3% of the women respectively. Placenta previa and accreta are the major factors for post-partum hemorrhage Proportion of preterm birth was 10.1% Proportions of meconium-stained liquor and poor APGAR score (<7) were observed among 4.5% each of the study participants.

Placenta previa was identified in 14.2% of women with a history of LSCS. To reduce the occurrence of placenta previa, it is important to reduce the number of primary cesarean procedures and promote vaginal births. For optimal care, if a patient must have c-section, routine prenatal examinations and identification of high-risk groups should be performed.

Keywords: Cesarean section, Placenta previa, Maternal outcome, Fetal outcome.

INTRODUCTION

The placenta is an essential organ responsible for attaching the fetus to the uterine wall. The placenta, which acts as a fundamental connection between the mother and the fetus for metabolic exchange, endocrine function, and other bodily processes, is essential for the well-being of both the mother and the newborn.

As a result, an ultrasonographic (USG) examination of the placenta during pregnancy is a beneficial tool for treating pregnancy. The primary goals of a USG of the placenta in the latter stages of pregnancy are to pinpoint the placenta's exact location and determine whether it has any abnormalities. It is considered that placental examination in early pregnancy might effectively recognise the risks for future illnesses. This is because the introduction of high-resolution transvaginal ultrasonography (TVS) has transformed our knowledge of placental research. It is believed that the position of the implantation, which determines the location of the placenta, is a significant factor in placental blood flow and, consequently, the fate of the pregnancy.

The human placenta is a complicated organ that is very important to the baby's development. The placenta acts as a conduit for transferring nutrients from the mother to the developing baby by drawing blood from the mother. It is the biggest fetal organ and plays an essential role in the fetal body's growth and its defence against outside threats. It is believed that the spot of implantation and the subsequent placement of the placenta inside the uterus are significant factors in the amount of blood supply to the placenta and therefore, the success of the pregnancy.

Failure of trophoblastic invasion into spiral arteries results in improper remodelling of uteroplacental arteries, inadequate perfusion, and release of cytokines, immune modulators, and leukotrienes into the maternal circulation. This leads to endothelial dysfunction, which in turn causes preeclampsia and intrauterine growth restriction (IUGR). When one uterine artery is the primary source of the inter villous flow, non-invasive aberrant doppler waveforms of the uterine arteries in the second trimester might signal inadequate uterine perfusion owing to placental implantation. This is the

case when the placenta is implanted." There is not a consistent distribution of the blood flow throughout the uterus. When the placenta is positioned centrally, the blood flow from both uterine arteries is distributed fairly evenly to it. When the placenta is positioned laterally, however, the uterine artery closer to the side of the placenta has a low resistance and a good blood flow, resulting in an uneven distribution of blood. The contribution made by the

collateral circulation to the other uterine artery, which supplies the placenta and is positioned laterally, is much lower.

Other placental regions besides the Previa may also be related to bad pregnancy, birth, and child outcomes. This is because the anatomical circumstances vary throughout various sections of the uterus, concerning the cavity's shape and blood supply.

It has been linked to premature labour, intrauterine deaths (IUD), and stillbirths when the placenta is in the posterior position. Because the uterus's posterior wall is thicker

and longer than the anterior wall, the blood flow to each wall is distinct due to these anatomical differences. There is a causal connection between the position of the placenta in the posterior of the uterus and foetal discomfort, higher rates of cesarean section, the incidence of meconium-stained fluid, and an increase in the frequency of foetal heart rate decelerations. It is more common to have a central placenta, which is associated with a greater risk of adherent placentas, early rupture of membranes, and preterm deliveries

According to Amer MB et al., the site of placental implantation and placement of the placenta inside the uterus are vital factors of the placental blood supply and, as a result, the results for both the fetus and the mother. Location of the placenta has specific effects on pregnant women, such as preterm birth, intrauterine growth retardation (IUGR), fetal malposition, malpresentation, and the development of hypertension.

It was demonstrated that the anterior placental location was associated with increased risks of fetal intrauterine growth retardation, and when the placenta is situated in the fundus zone transport, the risk of early separation of the membrane is higher. Both of these associations were found to be significant. Contradictory results have been found in research examining the hypothesis that IUGR and placental position are somehow connected. The placenta will adhere to the uterus wall, and the umbilical cord will develop from the placenta itself. The organ may be connected to the uterus's top, front, or rear, but this is the most typical location. There is a remote possibility that the placenta will become attached to the bottom portion of the uterus. When this occurs, the placenta is said to be "low-lying" (placenta Previa).

AIM AND OBJECTIVES

Aim

- To observe the localization of placenta in relation to previous cesarean section and its fetomaternal outcome

Objectives

- To determine the frequency of placental location in previous cesarean section.
- To determine fetomaternal outcome in previous CS
- To determine the fetomaternal outcome having placental previa with previous CS.
- To compare the incidence of placenta previa, associated factors, complications, placental position, mode of delivery and fetal and maternal outcome in.

MATERIALS AND METHODS

- The study was conducted in the Obstetrics and gynecology department of Dheeraj General Hospital, Piparia, Waghodia, Vadodara, Gujarat.

Study type:

- It was a cross-sectional type of observational study.

Study duration:

- The study was conducted over one and half year period

Study participants:

- Pregnant women who visited the Obstetrics and Gynecology department of Dhiraj General Hospital were screened for inclusion criteria

Inclusion criteria:

- One or more previous cesarean delivery
- Age group 18-45 years

Intrauterine pregnancy

- Gestational week more than or equals to 20 weeks

Exclusion criteria:

- Woman with first pregnancy
- Gestational week < 20 weeks
- Smokers
- Ectopic pregnancy.
- Multiple gestation
- Pregnancy with hypertension
- Pre term labour, pre rupture of membrane
- Not able to give consent.

Sample size:

- Sample size require for the present study was obtained by using the hypothesis testing method, and based on the following formula-

$$n = Z^2 p (1-p) / L^2$$

Where-

- Z-Z value at 95% confidence intervals 1.96
- p = The prevalence of LSCS in India-21.5% (NFHS 55)
- 1-p=78.5
- L= Margin of error = 6%

The calculated minimum sample was 187. In the present study 246 Individuals were included in to the analysis.

Sampling technique:

All eligible participants were acquired purposively.

Study tools:

- Data were collected with the help of pre formed case record form

Materials and Methods

Definitions and criteria:

Location of the placenta:

It was recorded as anterior, low anterior, posterior, low posterior, fundal, posterior previa, or anterior previa. Low anterior or posterior was defined as placenta localized close to but more than 2 cm from the internal cervical os.

Calculation of placental thickness

- It was calculated by taking the average of the three best measurements through the probe, oriented to scan perpendicular to the placenta. The placenta was labelled thin if the thickness was less than the tenth percentile, as normal if it was between the tenth and the ninetieth percentile, and as thick if it was more than the ninetieth percentile.
- The thickness of the myometrium at the midsection of the placenta was determined. Vascularization index (VI) measured by 3D ultrasound power Doppler was obtained from a present sonobiopsy in the midsection of the placenta and uterine wall.

Abnormal placentation

- Abnormal placentation was defined as placenta praevia, low lying placenta or any placental implantation in which there is abnormally firm adherence of placenta to the uterine wall characterized by loss of normal hypoechoic retroplacental myometrial zone.

Placenta Previa

- It was diagnosed when the placenta was less than 2 cm from or covered the cervical os.

Materials and Meshoals

Past-partum hemorrhage (PPH):

PP1H defined as blood loss 21,000 ml. and retained placenia.

Retained placenta:

It was diagnosed when placenta had to be removed manually after vaginal delivery or was substantially difficult to remove during cesarean section

Ethical issues

- All participants were given a participant information sheet (FIS) in their native language. Participants were told about the research's nature and aim, as well as the advantages and risks that might be incurred in course of the study. Confidentiality and privacy of the participants were and will be maintained at every level. No extra charges were applied to participants if they participate in the study neither any compromise had been done on the treatment part if they did not agree for the participation. If participants accepted to participate in the research, they signed an informed consent form. The research has been approved by the ethics committee at the institution.

Data collection procedure:

- After ethical approval from Institutional Ethical Committee (IEC) the data collection was started. Eligible participants (participants with previous LSCS and current pregnancy ≥ 20 weeks) were enrolled purposively in the study. All selected patients were provided participant's information sheet in the language which he or she understands before they give consent. Detailed history including menstrual history, obstetrics history, past history, personal history, marital

history, family history of the patient was taken, General and obstetrical examination were carried out. All women were undergone to transvaginal or transabdominal ultrasound. The USG was done by radiologists or sonologically trained obstetricians with the GE Proseries machine, 3.5MHz trans-abdominal probe Model 22749023, Aloka. Toshiba scan machines. The scan findings with regards to placental location and placentation are noted. Determining the placental location or any abnormal placentation with the transabdominal obstetric scan done between 28 weeks period of gestation and 42 weeks period of gestation, reassessed after 36 weeks or when patient presents in labor or with bleeding per vagina. The patients are followed up to delivery and the maternal and fetal outcomes are noted.

Study variables :

Independent variables

- Age of mother
- Body mass index (BMI) mother
- Gravidity and parity history
- Number of previous cesarean section

Outcome variables

- Mode of delivery
- Induction required or not
- Use of oxytocin
- Prolonged labour
- PPH
- Maternal mortality

Fetal outcome

- Perinatal mortality (still birth, newborn death in first week)
- Birthweight
- Birth asphyxia
- Meconium aspiration syndrome
- APGAR score at 1 minute and 5 minutes
- NICU admission required (neonatal seizures, transient tachypnoea of newborn, respiratory distress syndrome, hypoxic ischemic encephalopathy)

Statistical analysis:

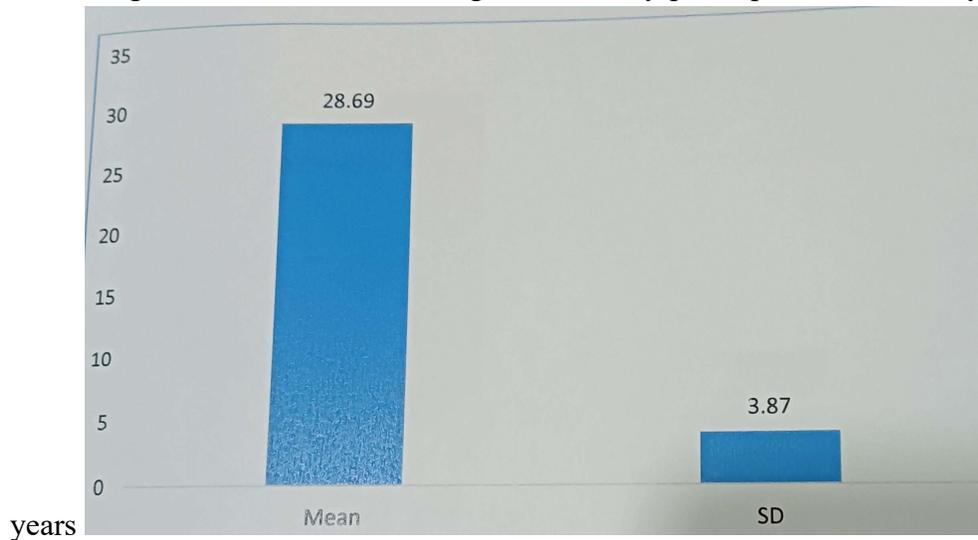
Epi info CDC 7 version was used to enter and analyse data. Mean and standard deviation were used to represent continuous variables. Proportions were used for categorical variables. The t test was used to evaluate the relationship between continuous variables. The chi square test was used to evaluate the relationship between category variables. Statistical significance was defined as a p value less than 0.05.

RESULTS

Table 5-1: Age distribution among study participants (n=246)

	Mean	SD
AGE (YEARS)	28.69	3.87

According to Table 5-1, the mean age of the study participants was 28.69 years with SD of 3.87



Age distribution among study participants

Gestational week among study participants

Gestational week	Mean	SD
Gestational week	34.57	3.84

The mean gestational week was 34.57 weeks among study participants

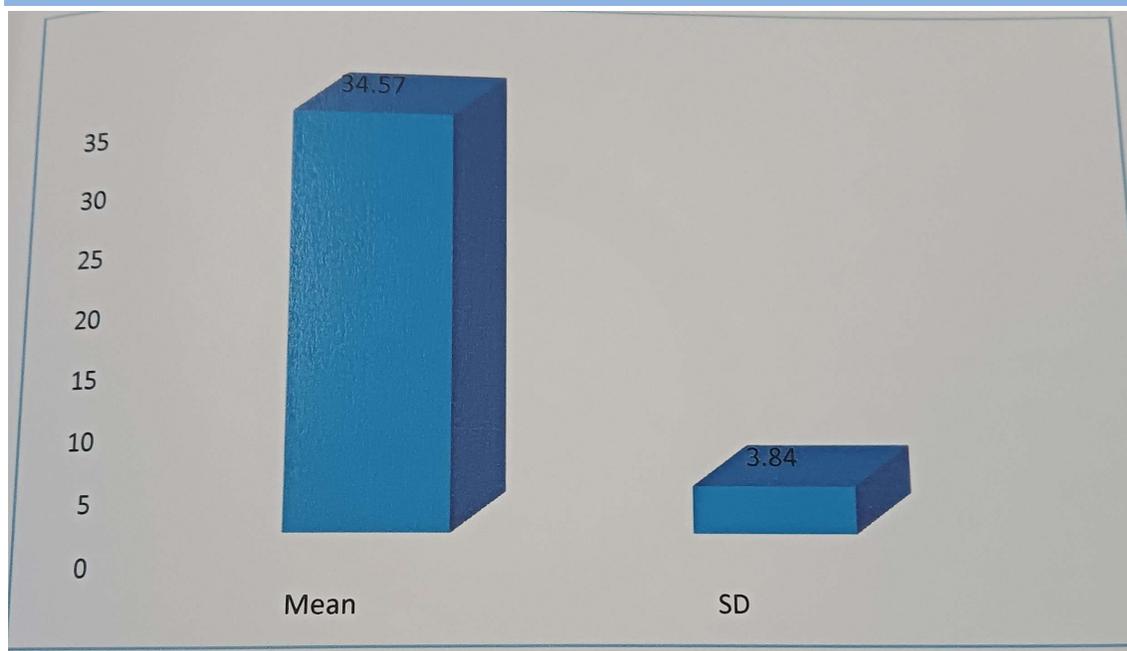


Fig 5.4 Gestational weeks among study participants

Tab 5-5 :Per vaginal bleeding among study participants (n=246)

Bleeding pv	Number	Percentages
Present	46	18.7%
Absent	200	81.3%

According to Table 5-5, 18.7% of the women had per vaginal bleeding.

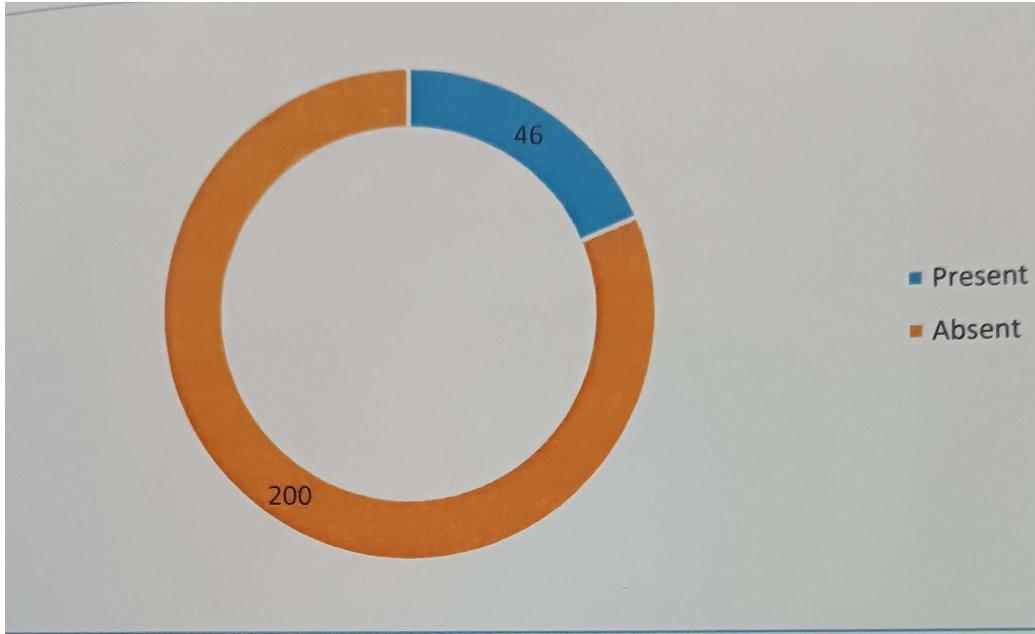


Figure 5-5: Per vaginal bleeding among study participants

Table 5-6: Gravida status among study participants (w-246)

Gravida status	Number	Percentages
2 nd gravida	127	51.6%
3rd gravida	108	43.9%
4 th gravida	11	4.5%

As shown in Table 5-6, 51.6% of the woman was 2d gravida while 43.9% and 4.5% of the mothers had 3rd and 4th gravida status respectively.

38.6%

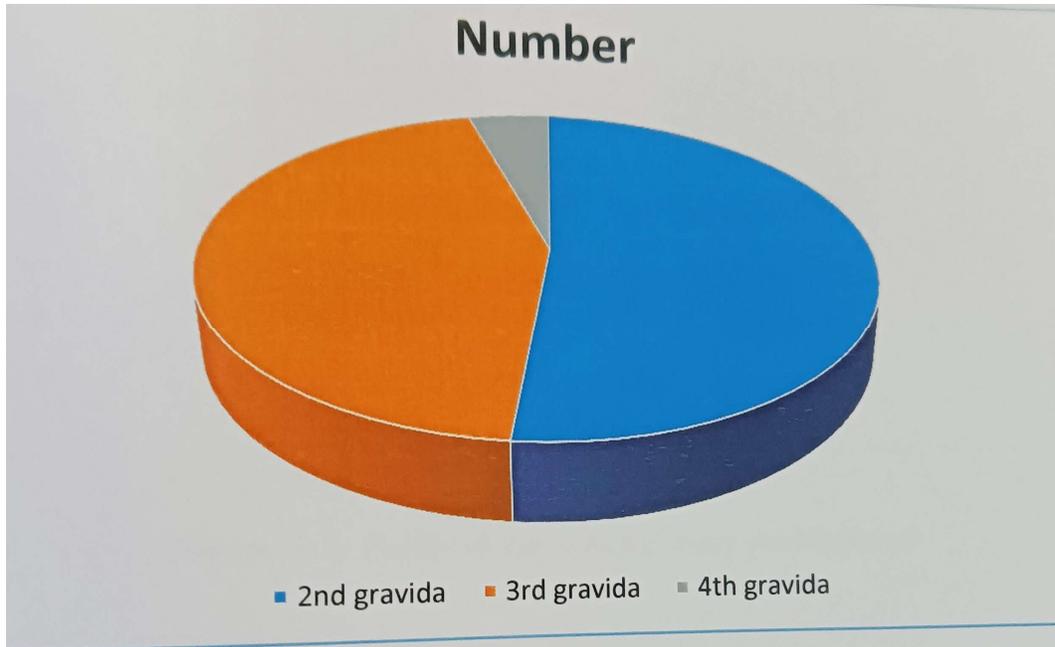


Figure 5-6: Gravida status among study participants

Table 5-7: Parity status among study participants (n=246)

Parity	Number	Percentages
Para 1	151	61.4%
Para 2	095	38.6%

Table 5-7: Parity status among study participants (n=246)

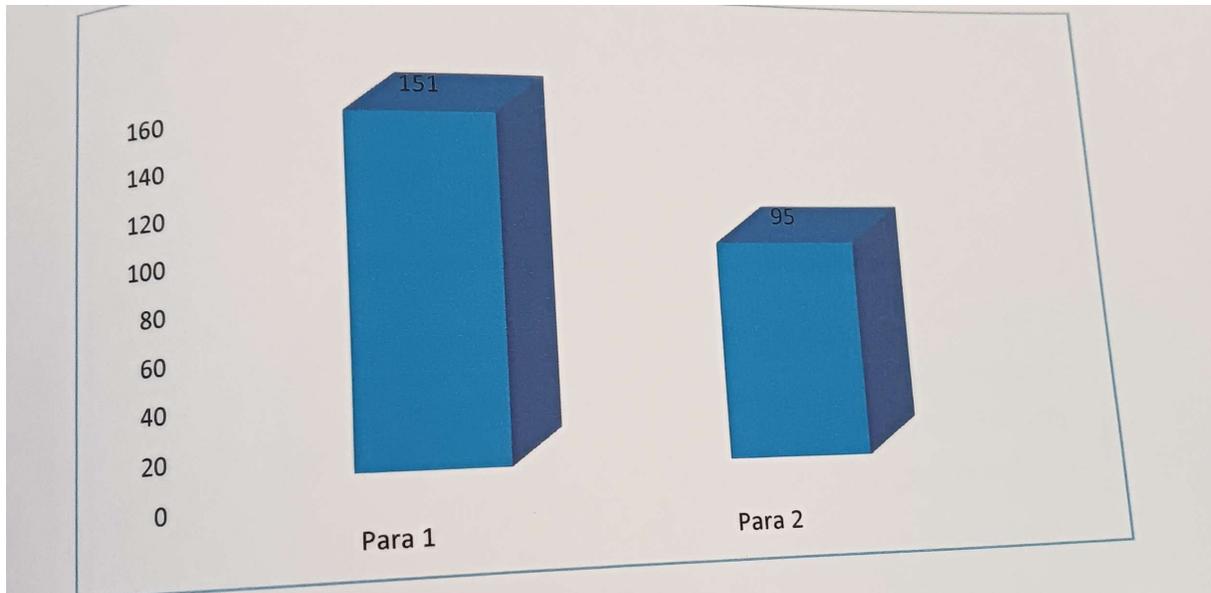


Table 5-7: Parity status among study participants (n=246)

Table 5-9: Previous Abortions among study participants (n=246)

Previous abortion	Number	Percentages
No	199	80.9
Yes	47	19.1

According to Table 5-9. Previous abortion was seen among 19.1% of the study participants

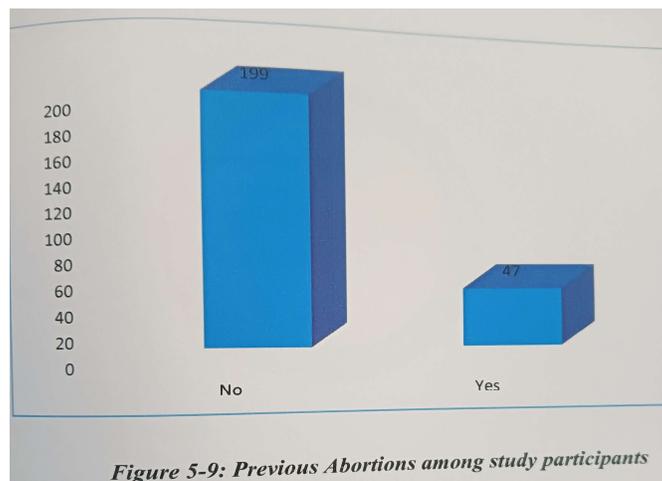
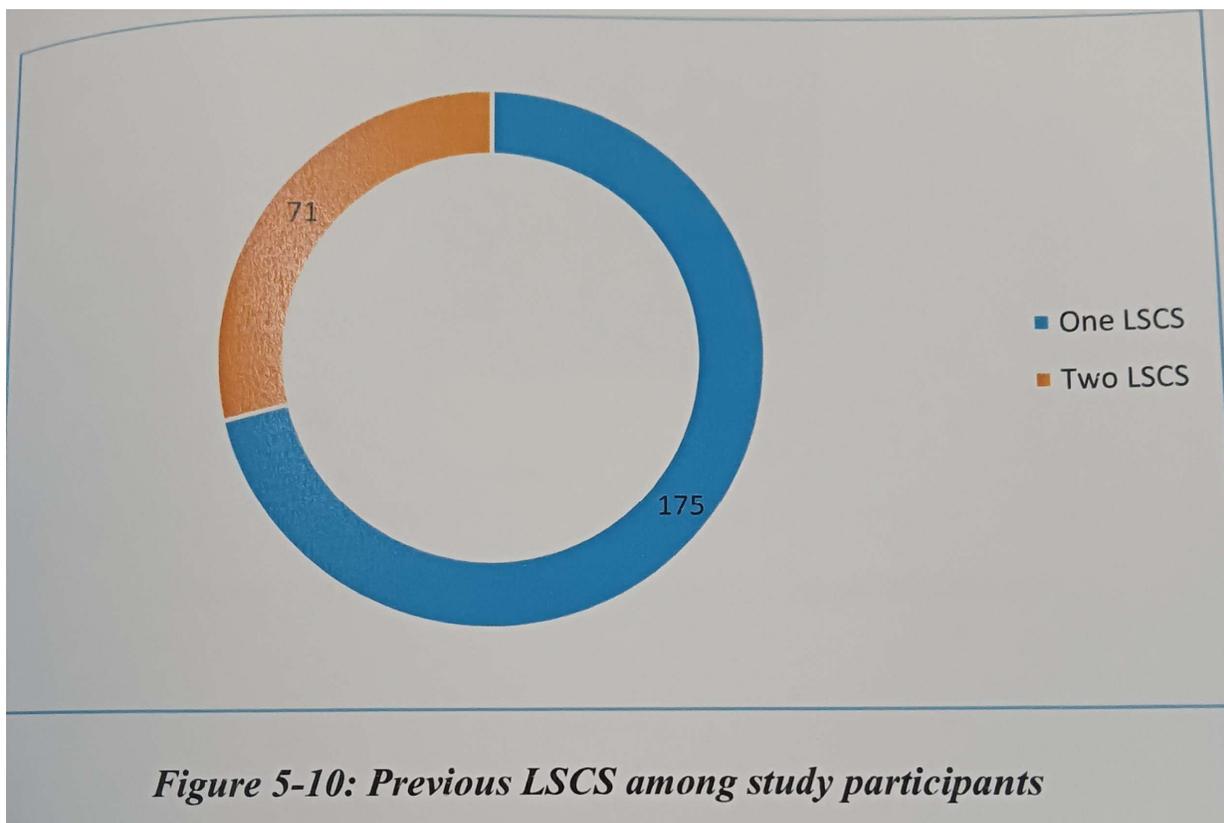


Table 5-10: Previous LSCS among study participants (n=246)

Previous LSCS	NUMBER	PERCENTAGES
ONE LSCS	175	71.1
TWO LSCS	71	28.9

As per Table 5-10. History of previous one LSCS was reported among 71.1% of the women while 28.9% were having two LSCS.

**Table S-16: Placental location based on USG among study participants (n=246)**

Placental location	Number	Percentages
Fundo posterior	93	37.8%
Fundo anterior	36	14.6%

Fundo lateral	59	24.0%
Low lying	23	9.3%
Placenta previa	35	14.2%

As shown in table 5-16, placenta previa was observed among 14.2% of the women who had previous history of LSCS. Fundo-posterior and fundo-anterior placenta was seen among 37.8% and 14.6% of the women respectively. Fundo-lateral and low-lying placenta were seen among 24% and 9.3% of the women respectively.

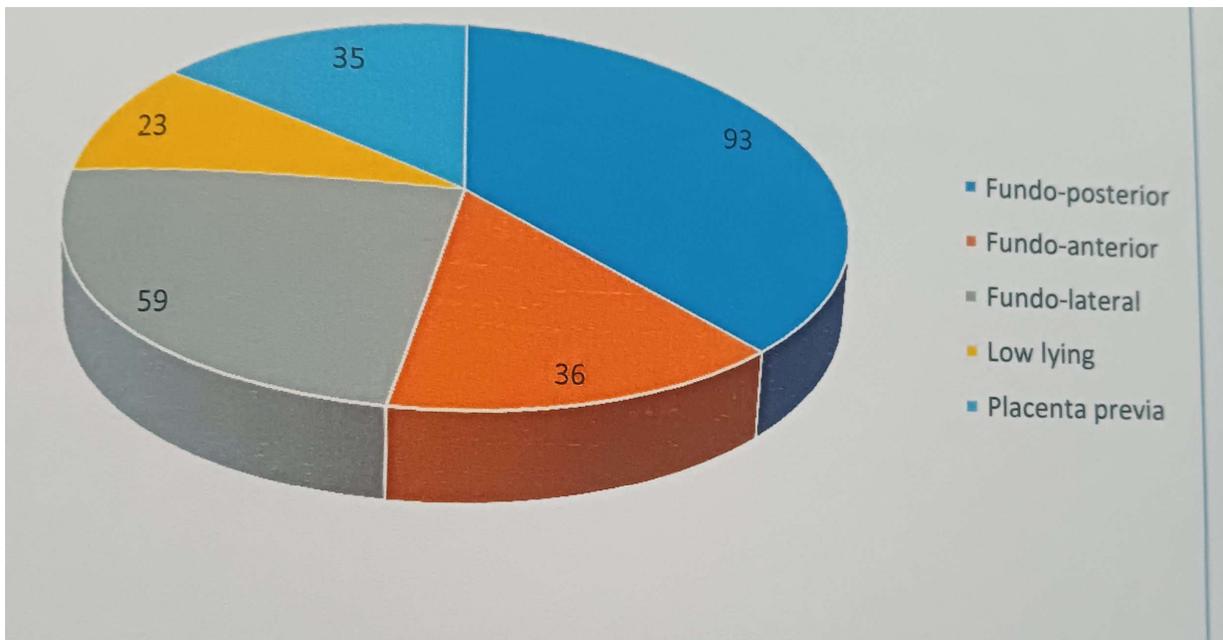


Figure 5-16: Placental location based on USG among study participants

Table 5-17: Mode of delivery among study participants (w=246)

Mode of delivery	Number	Percentages
Caesarean	246	100%

Among all women had to undergone with caesarean section as a mode of delivery

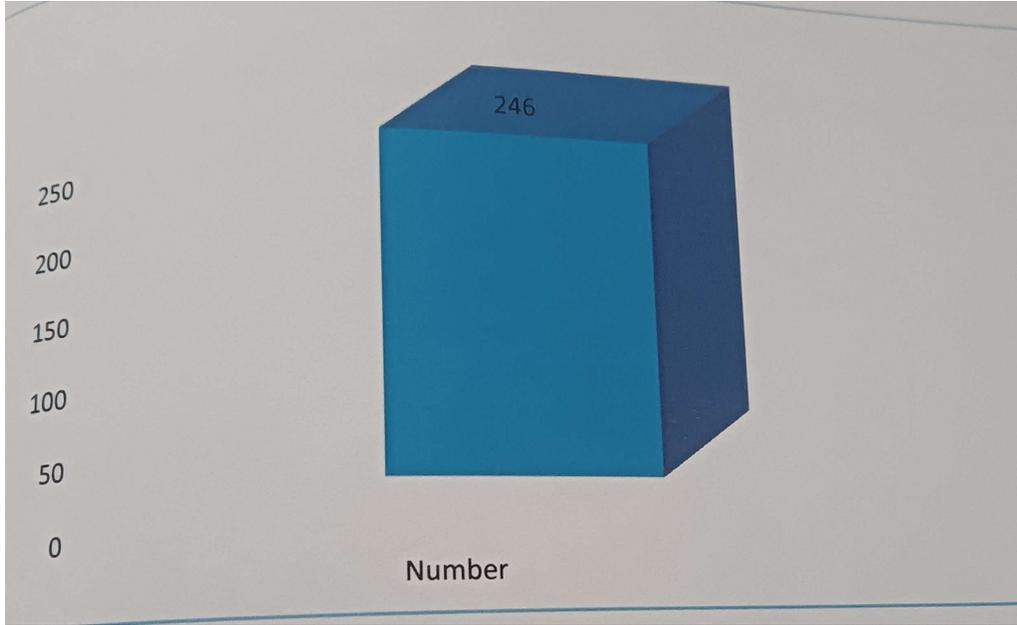


Figure 5-17: Mode of delivery among study participants

Table 5-22: Maternal complications among study participants (n=246)

Maternal complications	NUMBER	PERCENTAGES
No	211	85.8%
Placenta previa	23	9.3%
Placenta accreta(PPH)	12	4.9%

In present study, 9.3% of the mother had placenta previa while 4.9% had placenta accreta which leads to post-partum hemorrhage.

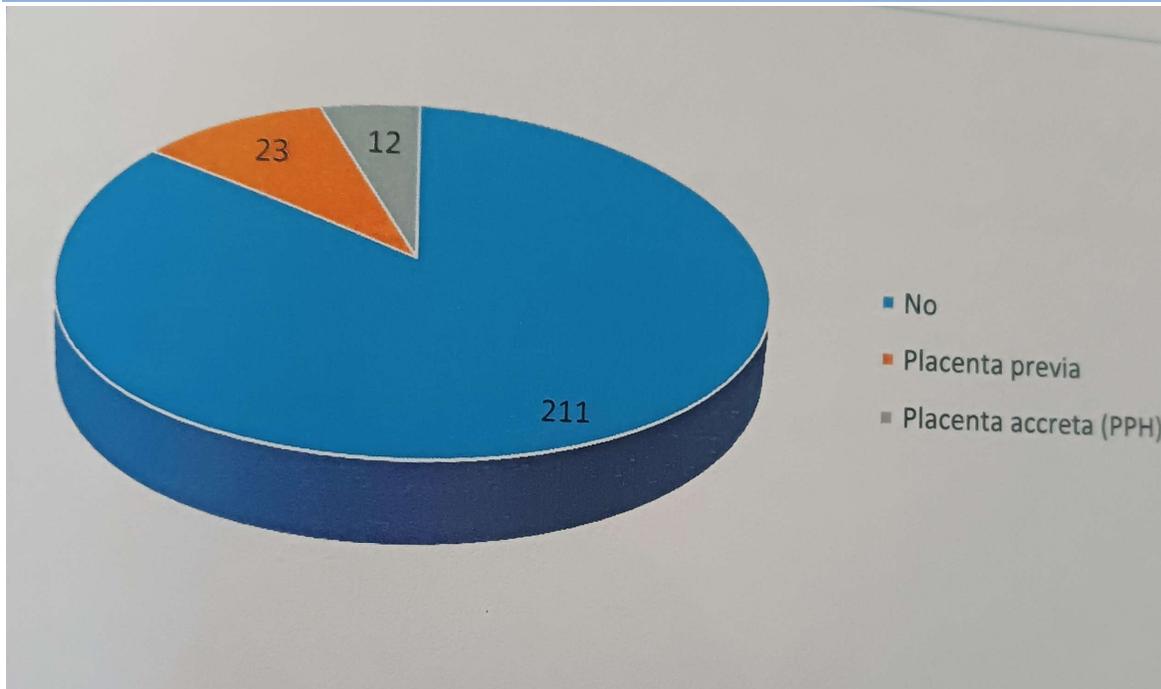


Figure5-22: Maternal complications among study participants

Table 5-23: Fetal complications among study participants (n=246)

Fetal complications	Number	Percentages
No	188	76.4%
IUGR	23	9.3%
Birth asphyxia	12	4.9%
Fetal distress	12	4.9%
Meconium -stained liquor	11	4.5%
Poor APGAR Score(<7)	11	4.5%

In present study, 9.3% of the babies were growth retarded. Proportions of birth asphyxia and fetal distress were 4.9% each of the newborn babies born to study participants. Proportions of meconium-stained liquor and poor APGAR score (<7) were observed among 4.5% each of the study participants

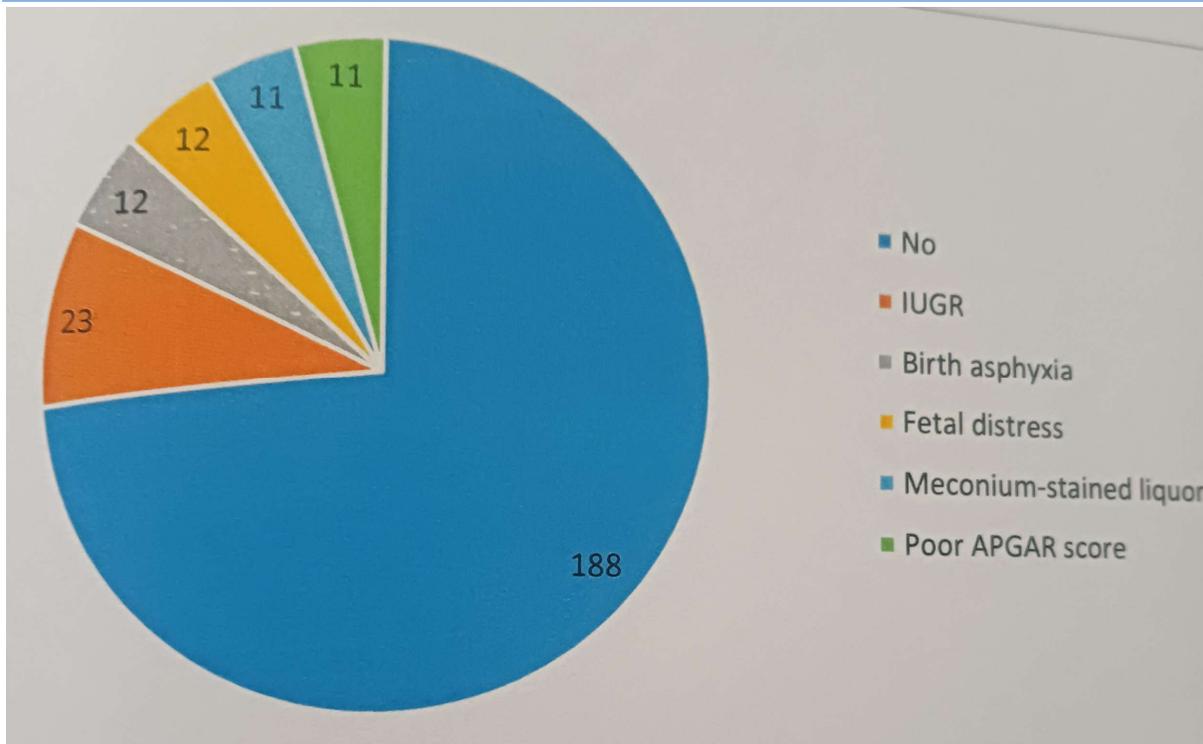


Figure 5-23: Fetal complications among study participants

DISCUSSION

Maternal life passes through the process of child carrying, which, although being a joyous occasion, causes the mother to experience a crisis and a great deal of stress. Caesarean section has progressively increased over the last two decades and is now the most prevalent obstetric operating treatment worldwide. Some studies have shown an increase in the prevalence of placental anomalies in women who had previously had Caesarean births.

Although placental anomalies are infrequent, they are one of the primary causes of uterine hemorrhage during the later stages of pregnancy. They have been identified as a significant predictor of maternal morbidity and unfavorable perinatal outcomes such as postpartum hemorrhage, premature deliveries, low birth weight infants, stillbirths, neonatal and perinatal mortality. Despite the introduction of ultrasound to detect these problems and the capacity to measure fetal lung maturity in order to timing delivery correctly, attempts to enhance perinatal outcome remain difficult. Present study was conducted to observe the localization of placenta in relation to previous cesarean section and its feto-maternal outcome

The mean gestational week among study participants was 34.57 weeks in this study. Patients at a gestational age of 35 weeks were the majority in the research conducted by Chamua B et al. Majeed T et al." revealed that the majority of women were in the 36-week gestational age range.

In the current study, 90.7% of the cases were booked, whereas 9.3% of the cases were unbooked. In the research conducted by Hasan S et al., 68.4% of patients were unbooked and 31.6% were booked. Bhowmik J et al. had reported 30% of patients had frequent prenatal visits and were scheduled at both the referral hospital and the current hospital. In the current research, the greater proportion of booked percentages is attributable to the high prenatal registration rates of women in Gujarat. In present study, 18.7% of women had per vaginal hemorrhage. According to Hasan S. et al., " 74% of women had painless vaginal bleeding.

Parity:

In the current research, 61.4% of the women were primiparous and 38.6% were multiparous. Nasreen F et al. did research and discovered that seven times as many as nulliparas had placenta praevia. According to the research by Clemintki A et al. the frequency of placenta praevia was considerably greater in women with past births compared to primiparas, and rose as the number of prior deliveries Increased. Bhat SM et al. did retrospective research on 58 individuals with placentas praevia and discovered that 44% of the patients had five or more pregnancies. This indicated that the risk of placenta praevia increased with increasing gestational age According to Kidndo P et al.,* multiparity produces atherosclerotic alterations in the uterus, which may result in infarction and placental hypoperfusion. This under perfusion may lead the placenta to encroach on the lower uterine section, resulting in a larger placenta.

Previous abortion:

In the present study, 19.1% of women had prior abortion experience, 41% of patients in the research group of Kaul S. et al. had a history of abortion. There is a substantial connection between past spontaneous abortions and placenta praevia (1.77; 95% CI: 1.60, 1.94) and between prior induced abortions and placenta praevia (1.36; 95% CI: 1.02, 1.69) according to a meta-analysis by Karami M et al.⁷⁷

Previous LSCS:

In the present study, 71.1% of women reported having one LSCS in the past, whereas 28.9% reported having two LSCS. The incidence of prior caesarean section was 52% in individuals with placenta praevia, compared to 24% in the control group, as determined by Mahmood Malik AM et al. In the research conducted by Chamua B et al., it was shown that placenta previa was more prevalent in women with three or more prior LSCS (50%) compared to those with two or more previous LSCS (12%)

Uzma et al. observed that the incidence of placenta previa increased from two to three LSCS procedures, from 24.3% to 55.5% Parvin Z et al. discovered that placenta previa was more prevalent in women who had had three prior LSCS (20%) than in those who had undergone two or LSCSs (11.4%)

In research conducted by S. Bellalawetha et al. the incidence of placenta praevia in the study group was 6 percent, compared to 1.75 percent in the control group (p0.05).

Possible reasons for caesarean section being a risk factor for the development of placenta praevia include uterine injury and scarring generated by the procedure. The attraction and adhesion of the placenta to the surgical scar may also play a role. Scarring may also impede the natural migration of the placenta and the physiological development of the lower uterine region.

Placental location:

Placenta previa was detected in 14.2% of women with a prior history of LSCS in this study. Fundo-posterior and fundo-anterior placentas were seen in 37.8% and 14.6%, respectively, of the women. In 24% and 9.3% of the women, respectively, the placenta was fundo-lateral or low-lying.

At 28 weeks, 54.5% of the placentae in the research by Belachew J et al.⁸⁰ was anterior, whereas 45.5% were in different positions. Between the usual scan at 18 weeks and the evaluation at 28 weeks, 23 (62.2%) of the low-lying placentas moved to a posterior or anterior position. Placenta previa was identified in eight women (2%); two were posterior and six were anterior. Naji et al. reported that more posterior placentas are seen in women with a history of cesarean delivery. They

evaluated placental position in week 12 of pregnancy. In contrast, Belachew J et al discovered that the majority of placentae are anterior, which is also the case with placenta previa. The position of the placenta was evaluated at week 28. Lal et al.* found that 61% of second-trimester placenta previa in women with a history of cesarean birth moved before to delivery. Hadley et al. discovered that fundal placentation increased the likelihood of preterm membrane rupture. They hypothesized that the fundal placental position has the membranes weakest point above the cervical os, hence leading to early rupture of membranes.

In this research, 9.3% of women who had previously had LSCS had placenta previa. Chawla J. et al. and Poonia S. et al. *s found 8.9% and 8.3%, respectively, of placenta previa among women with LSCS, which is consistent with the current research. Chamua B et al. and Singh P et al. found placenta previa in 14.8% and 19.1% of women, respectively, which is greater than the current research.

In the present study, adherent placenta (placenta accreta) was seen in 4.9% of women having a history of LSCS. 5.3% of women who had previously had LSCS were found to have a morbidly adherent placenta, as determined by Singh P et al. In the research conducted by Chamua B et al., 12.9% of the placentas were attached, but Nazaneen et al. reported adhering placenta rates of 2.43%.

PPH:

In the current study, 9.3% of women needed a blood transfusion, indicating postpartum hemorrhage. This is consistent with the findings of Taylor et al. and Belachew J et al.⁸⁹ who

respectively found 8.7% and 11.9% of PPH. among women with a history of LSCS In the research conducted by Chamua B et al., postpartum Discussion hemorrhage (PPH) was seen in 14.8% of cases, compared to 5.5% of women undergoing obstetric hysterectomy. Uzma et al. found a PPH rate of 55%, with 12% of women undergoing hysterectomy, whereas Chawla det at found a rate of 30.3%, with 0.27% of women, undergoing obstetric hysterectomy in the research conducted by Sharma T. et al. blood transfusions and iron injections were d in 16 instances (25.4%) with PPH and anemia administered

In this research, all women having a prior LSCS were required to have a cesarean section for the current pregnancy. 19.1% of women were had to have a premature cesarean section. According to Nazaneen S et al, 18.15% of premature C-sections were performed on patients hospitalized with emergency symptoms such as preterm labor pains, PROM, and scar discomfort, which is consistent with the findings of the current research. In the research conducted by Chiniwar MA et al. and Singh S et preterm CS was necessary in 1.16 and 8% of cases, respectively.

The average birthweight of newborns was 2.74 kg, with a standard deviation of 0.5 kg. 9.3 % of infants born to study participants had IUGR.4.9% of women reported experiencing fetal discomfort. Singh S. et al. documented fetal discomfort in 34.61 % of mothers with a history of LSCS. Phelan et al. and Dayal V et al. both reported a 15% fetal distress rate necessitating CS. The percentage of fetal discomfort reported by Bangal VB et al. and Singh N et al.9% was 46.66% and 47.97%, 95 respectively. The rate of asphyxia at birth was 4.9% among newborns born to study participants. 4.5% of infants delivered to mothers with a history of LSCS had meconium-stained liquor. Poor APGAR scores were seen in 4.5% of infants delivered to mothers with a history of LSCS. Bhowmik J et al." revealed that 3.57% of newborns had an APGAR score of less than 7 at delivery. In the research of Chiniwar

M et al. of prenatal morbidity necessitating admission to the NICU occurred in 21 infants (3.32%) while infant death occurred in 25 infants (3.96%). Prematurity (11 newborns) and congenital abnormalities (3 newborns), neonatal sepsis (9 infants), and unknown causes accounted for the mortality

CONCLUSION

As one of the most feared causes of maternal death and morbidity, placenta previa is linked to an increase in the risk of prior cesarean surgery.

In the current research. 71.1% of women reported having one LSCS in the past. whereas 28 reported having two LSCS. All women were required to deliver using LSCS. However with increasing number of cesarean section scar the incidence of cesarean section kept on increasing

Placenta previa was identified in 14.2% of women with a history of LSCS, whereas 4.9% had postpartum hemorrhage.

The percentage of premature births was 10.1%. In the current research, 9.3% of infants had growth retardation. The incidences of birth asphyxia and fetal discomfort were respectively 4.9% among the newborn of research participants. In 4.5 percent of research participants, meconium-stained beverages and a low APGAR score (7) were seen.

Important components of its care include early diagnosis, thorough monitoring, and prompt action. To reduce the occurrence of placenta previa, it is important to reduce the number of primary cesarean procedures and promote vaginal births. For optimal care, if a patient must have c-section, routine prenatal examinations and identification of high-risk groups should be performed.

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