

Effect of Mode of Delivery and Number of Parity on Abnormal Placental Location

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ABSTRACT

Objective: To determine the effect of mode of delivery and number of parity on abnormal placental location encountered at Pak Emirates Military Hospital Rawalpindi.

Study Design: Comparative cross-sectional study.

Place and Duration of Study: Department of Gynaecology & Obstetrics, Pak Emirates Military Hospital Rawalpindi, from Jun 2019 to May 2020.

Methodology: The study included all the antenatal patients with any abnormally placed placenta on ultrasound or MRI, if required, at the 32nd week of gestation. On ultrasound examination, controls were an equal number of antenatal women with the customarily located placenta. Factors like age, parity, previous mode of delivery, and iron deficiency anaemia were compared in both groups.

Results: The mean age of the study participants was 32.11 ± 8.29 years. Out of 70 cases of abnormal placental location in pregnant women, 40 (57.1%) had placenta previa, 20 (28.6%) had accreta, while 10 (14.3%) had placenta percreta. Pearson chi-square test revealed that multiparity and previous deliveries by caesarean section had a statistically significant relationship with abnormal placental location among the study participants (p -value <0.05).

Conclusion: Placenta previa is the commonest abnormal placental location in our study, followed by accrete and percreta. Previous deliveries by caesarean section and multiparity were independent risk factors related to abnormal placental location in our target population.

Keywords: Caesarean section, Multi-parity, Placenta accreta, Placenta percreta, Placenta previa.

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INTRODUCTION

Placental abnormalities regarding their location may be of various types. Placenta previa has been the most commonly encountered type of abnormally placed placenta.^{1,2} Other abnormalities include circumvallate placenta, placenta accretes, placenta increta and placenta percreta.³ Both gynaecologists and radiologists should have adequate knowledge to pick these abnormalities to pre-empt the complications among such patients.^{4,5}

Multiple risk factors have been related to placental abnormalities in the position of the placenta.⁶ A previous study in 2014 assessed the role of previous caesarean section scar in determining low-lying placenta in future pregnancies. They designed a retrospective case control study to observe any correlation between the two variables. Results of their study were negative, and previous caesarean section did not predict low-lying placenta in coming pregnancies.⁷ Another study in 1993, determined the relationship between previous caesarean section (CS), placenta previa and placenta accreta. Of 41,206 consecutive deliveries, 1851 had a

previous caesarean section, and 222 had placenta previa. Of the cases of placenta previa, 175 occurred in the uterus and 47 occurred after previous CS. Placenta previa complicated in 2.54% of cases with a previous caesarean section compared with 0.44% of cases with no scar. In patients with placenta previa occurring with a previous scar,¹⁸ were complicated by placenta accreta (38.2%) compared with only 8 (4.5%) in unscarred uteri. After one caesarean section, placenta previa was complicated by accreta in 10% of cases, and after two or more, this was 59.2%. The risk of hysterectomy with placenta previa and the uterine scar was 10%. However, with placenta previa accreta, 66%.⁸ In 1998, a similar study, concluded a high association between anterior placenta previa, placenta accreta and previous caesarean section. This was enhanced by the increasing number of previous caesarean sections. Patients with an antepartum diagnosis of placenta previa who have had a previous caesarean section should be considered at high risk of developing placenta previa and accreta.⁹

In a country like ours, where many pregnancies remain un-booked and a high maternal mortality ratio, we need to look at all those factors that could complicate the pregnancies, delivery, or postpartum period. A local study from Karachi looked at all the factors

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that could reduce placenta previa. They concluded that with the rising rate of caesarean sections over eight years from 12-38%, the frequency of placenta praevia has increased. Some patients present as unbooked cases in an emergency; therefore, haemorrhage-associated morbidity remains high.¹⁰ We planned this study to look for the effect of mode of delivery and number of parity in abnormal placental locations encountered at the Pak Emirates Military Hospital Rawalpindi.

METHODOLOGY

This comparative cross sectional study was conducted from June 2019 to May 2020 at the Department of Gynaecology & Obstetrics, PEMH Rawalpindi. Ethical approval (via IREB letter no. A/28) was taken before the start of the study. The sample size was calculated using the WHO sample size calculator and keeping the population proportion of placenta previa at 0.15%.¹¹ Non-probability consecutive sampling technique was used for data collection.

Inclusion Criteria: Pregnant women with age 18 to 45 years, presenting for routine antenatal check-up and who underwent obstetric ultrasound or MRI if required, at 32nd week of gestation were included in this study.

Exclusion Criteria: Patients who had any evidence of hydatidiform mole or any pelvic tumour or fibroids, patients with previous bad obstetric history or assisted fertilization, pregnant ladies with pelvic surgeries in the last five years other than caesarean section were excluded from the study.

Cases were the pregnant females with any abnormal placental location (previa, accreta or percreta) diagnosed by ultrasound (and MRI if required). Controls were pregnant women with normal placental locations. An equal number of cases and control were recruited in the study.

Written informed consent was taken from all the cases and controls. Patients with the abnormal placental location on ultrasound (and MRI if required) and controls both underwent detailed history taking and relevant laboratory examination. The relevant data was collected for comparison. All the information required for the study was entered in the structured proforma. Iron deficiency anaemia, was defined as a haemoglobin concentration of less than 11 g/dL.¹²

Statistics Package for Social Sciences version 23.0 (SPSS-23.0) was used for data analysis. Mean and standard deviation was calculated for the age of the study

participants. Frequency and percentages were calculated for qualitative variables. Pearson chi-square was used to see the difference between the groups. The *p*-value of ≤0.05 was considered statistically significant.

RESULTS

An equal number (70 each) of cases and controls were included in the study after applying inclusion and exclusion criteria. The mean age of the study participants was 32.11 ± 8.29 years. 96 (68.6%) women had no anaemia, while 44 (31.4%) had the iron deficiency anaemia. 67 (47.8%) women had >1 previous scar for caesarean section, 61 (43.6%) women had one previous uterine scar, while 12 (8.6%) had no scar. 48 (34.2%) pregnant women were primiparous, while 92 (65.71%) were multiparous. Table-I summarized the baseline characteristics of the study population.

Table-I: Baseline characteristics of the study population.

Variables	n(%)
Age (years) (Mean ± SD)	32.11 ± 8.29 years
Types of Placental Abnormalities	
Previa	40 (57.1%)
Accreta	20 (27.6%)
Percreta	10 (14.3%)
Mode of delivery	
No previous scar	12 (14.3%)
One scar	61 (43.6%)
>1 scar	67 (47.8%)
Parity	
Primiparous	48 (34.2%)
Multiparous	92 (65.8%)
Iron deficiency anemia	
No	96 (68.6%)
Yes	44 (31.4%)

Table-II: Pearson chi-square for comparison of various factors among study groups.

Parameters	Controls without Abnormal Placental Location	Cases with Abnormal Placental Location	<i>p</i> -value
Age (Years)			
18-30	32 (45.7%)	30 (42.8%)	0.734
>30	38 (54.3%)	40 (57.2%)	
Previous Scars / Mode of Delivery			
>1 Scar	35 (50%)	32 (45.8%)	0.005
1 Scar	24 (34.2%)	37 (52.8%)	
No Scar	09 (12.8%)	03 (4.28%)	
Parity			
Primiparous	27 (56.25%)	21 (43.75%)	0.001
Multiparous	43 (46.8%)	49 (53.2%)	
Iron Deficiency Anemia			
No	47 (67.1%)	49 (70%)	0.716
Yes	23 (32.9%)	21 (30%)	

Out of 70 cases of abnormal placental location, 40 (57.1%) pregnant women had placenta previa, 20

(28.6%) had accrete, and 10 (14.3%) had placenta percreta. Pearson chi-square test revealed that multiparity and previous deliveries by caesarean section had a statistically significant relationship with the presence of abnormal placental location among the study participants (p -value <0.05). In contrast, age and the presence of iron deficiency anaemia had no relationship with abnormal placental location (p -value >0.05) as shown in the Table-II).

DISCUSSION

From our study, we found that placenta previa was the commonest abnormal placental location, followed by accreta and percreta. Previous deliveries by caesarean section and multiparity were independent risk factors related to abnormal placental location in our target population.

There may be multiple maternal or fetal factors that may complicate the pregnancy.¹³ Placental abnormalities make up a considerable chunk of the conditions, which may cause complications.¹⁴ There are multiple risk factors that could lead to placental abnormalities, and patients with multiple risk factors can be overseen during pregnancy. We, therefore, planned and conducted this study to determine the effect of mode of delivery and number of parity on abnormal placental locations encountered at, Pak Emirates Military Hospital Rawalpindi.

A study by Majeed *et al*, in 2015 comprised 114 cases who underwent caesarean sections (37 cases out of 645 cases with non-scarred uterus and 77 cases from 721 cases with a scarred uterus) at Lady Willing don Hospital. They concluded that a significantly higher percentage of cases of placenta Previa was found among patients coming to a tertiary care hospital with a previously scarred uterus.¹⁵ Our results supported their findings strongly as previous scars emerged as a risk factor for the presence of all the placental location abnormalities, and placenta previa was the common among the cases.

Shi *et al*, in 2018, conducted a retrospective study spanning over seven-years data of singleton pregnancies managed at their hospital. Cases included patients with placenta accrete and one previous caesarean section scar and placenta praveia, while controls comprised subjects with one caesarean section and placenta praveia. They concluded that women with a primary elective CS without labour have a higher chance of developing an accreta in a subsequent pregnancy complicated with placenta previa.¹⁶ Our findings were very similar that study. Placenta previa emerged as the

common abnormal placental location, followed by accreta and percreta. Previous deliveries by caesarean section and multiparity were independent risk factors related to abnormal placental location in our target population.

Alhainiah *et al*, in their study concluded that premature rupture of membrane, intrauterine growth retardation, breech presentation and preterm labour, placental abnormality and postpartum haemorrhage have been more common in multipara and grand multipara as compared to primipara women.¹⁷

Shahida *et al*, revealed that complications like placenta praevia, abruptio placentae, multiple pregnancy, mal-presentation, postpartum haemorrhage, and ruptured uterus were significantly higher among grand multipara, and statistically significant results were observed. During the study period, seven maternal deaths were observed in grand multipara and one in non-grand multipara ($p<0.05$).¹⁸ Our results supported their findings as parity and past caesarean section was significantly related to placental abnormalities.

CONCLUSION

Placenta previa was the commonest abnormal placental location in our study, followed by accreta and percreta. Previous deliveries by caesarean section and multiparity were independent risk factors related to abnormal placental location in our target population.

Conflict of Interest: None.

Authors' Contribution

MAS: Design acquisition, analysis and interpretation of data, NA: Conception, design and final approval, HS: Article drafting and interpretation of data.

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