Original Research Article

Association of placental location and pregnancy outcome in antenatal patients with history of previous caesarean section

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Abstract

Background: Second trimester scan is one of the reliable marker for the placental localisation and overall health of the growing fetus. Our aim was to study the association between the location of placenta and the future pregnancy outcome. **Material and Methods:** It is a prospective cross-sectional longitudinal study on 75 antenatal patients with history of previous caesarian section done in Dr. D. Y. Patil Medical college, Hospital and Research Centre, Kolhapur. **Result:** Of the 75 patients studied, the mean age and standard deviation was 26.01 ± 3.22 years. Among the study group, 21.34% had anterior placenta, 22.67% had posterior placenta, 12.00% had fundal placenta, 25.34% had lateral placenta and 18.65% had low lying placenta. Lateral placenta was most commonly associated with pre-eclampsia(57.9%) and low lying placenta with malpresentation (42.87%). Anterior, posterior and fundal placentae had higher incidence of IUGR (18.75%, 29.40% and 22.22% respectively). By Chi square test, it is observed that there is significant association in placenta location and pregnancy outcome.($p<0.0004$**). **Conclusion:** This study suggests that there is significant association of placental location with pregnancy outcome, which can be determined by routine ultrasonography.

Key Word: Placenta, Pregnancy outcome, Previous Caesarean Section, Ultrasonography

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Received Date: 29/01/2019 Revised Date: 27/02/2019 Accepted Date: 18/03/2019
DOI: https://doi.org/10.26611/1012936

Access this article online	
Quick Response Code:	Website: www.medpulse.in
	Accessed Date: 21 March 2019

INTRODUCTION

Placenta(Greek: 'plakous' meaning 'flat cake'), the natural connection between foetus and mother during pregnancy, is responsible for nutritive, respiratory, and excretory function of foetus.[1] It also plays vital role in the development and growth of the foetus. Any minor changes in the placental development and location has deleterious effect on the foetus thereby disturbing the foetomaternal milieu. It has been hypothesised that site and quality of placental attachment also influences the pregnancy outcome. The blood supply of placenta is not uniformly distributed. Size of implantation and the placental location determine the placental blood flow and thereby the pregnancy outcome. There is an association between the location of placenta and fetal mal-position and mal- presentation, small for gestational age, low Apgar score, development of preeclampsia and even still births. Modern obstetrics has seen increasing trend of caeserean sections(CS) due to varied reasons. Increase in the rates of primary caeserean sections has led to rise in repeat CS. In India repeat cesarean delivery rate increased from 53.16 per 1,000 live births (5.31 %) in 2001 to 64.88 per 1,000 live births (6.48 %) 2006 to 79.36 per 1,000 live births (7.93 %) in 2011.[2] The presence of uterine scar is said to be associated with abnormal placentation. So we decided to carry out this study in our hospital to find the association of placental location with pregnancy outcome in patients with previous caesarean section.

How to cite this article: Suruchi M Pawar, Sreeshti Jaiswal, Akanksha Singh, Shashikant R Kulkarni, Manjiri M Desai. Association of placental location and pregnancy outcome in antenatal patients with history of previous caesarean section. *MedPulse – International Journal of Gynaecology.* March 2019; 9(3): 81-84. http://medpulse.in/Gynacology/index.php

AIMS AND OBJECTIVES

To study the association of placental location and pregnancy outcome in patients with previous caesarean section.

MATERIALS AND METHODS

It is a prospective observational longitudinal study conducted in Dr. D Y Patil Hospital and Research Institute, Kolhapur from August 2017 to August 2018. Antenatal patients with history of previous caesarean section attending the antenatal OPD and following up regularly for safe confinement at our hospital, were enrolled for the study.

Sample size: 108antenatal patients with history of previous caesarean section were enrolled in the study. Of these 33 patients were lost to follow up. Remaining 75 were followed upto delivery and analysed.

Exclusion criteria: Twins/multiple pregnancy, fibroid uterus with pregnancy, patients with previous history of hysterotomy, cases with congenital malformations of the uterus, history of rupture or perforation of uterus and vesicular mole. Patients ending in no follow up/lost up for follow up were also excluded. Prior to enrolling the patients, clearance from the ethical committee was obtained. An informed written consent was taken of all the patients included in the study. Basic demographic information like maternal age, parity, obstetric history, menstrual history, medical history, family history of each patient was noted using a structured proforma. General and systemic examination was done. Gestational age was determined using last menstrual period when known or using earliest ultrasound report(8-10 weeks).Ultrasonographic examination of each patients was done using LOGIQ F8 Expert ultrasound machine with a frequency of 3.5MHz transabdominal transducer at 12-24 weeks, 24-34weeks and 34-40 weeks. Each placenta was categorized as anterior, posterior, lateral, fundal or low lying. Line of management was planned accordingly. The patients were followed up till delivery and postnatal period. The outcome of each pregnancy was analyzed with respect to the placental localization. The outcome variables that were studied by us were intrauterine growth retardation(IUGR), pre eclampsia, preterm labor, and mal presentation. The collected data was compiled and analyzed using EPI info (version 7.2). Qualitative variables were expressed in percentage while the quantitative ones were categorized as percentage or in terms of median and standard deviation. Association between qualitative variables was analyzed using Chi square Test. All tables were graphically represented. All analysis were 2 tailed. $p<0.05$ is considered statistically significant at 5% level of significance.

RESULTS AND OBSERVATIONS

Ours is a tertiary level teaching hospital in Western Maharashtra, catering to rural and semi urban population mainly. Majority of the cases in our study were in the age group of 21 to 25 years followed by 26 to 30 years. The mean age was 26.01± 3.22 years(mean± SD). (Table 1). Out of the total 75 patients enrolled in our study, 12 patients were given Trial of Labour after Caesarean (TOLAC). Of these 12 patients, 4 patients had signs of foetal distress and hence were taken up for CS and 8 patients delivered vaginally uneventfully. Patients who underwent CS majority had lateral lacenta. Majority of the patients, out of the 75 enrolled in the study, had lateral placenta (25.34%) followed by anterior placenta (21.34%), low lying placenta (18.65%) and fundal placenta(12.00%) (Table2). Out of the patients with lateral placenta, maximum number of patients(57.90%)had preeclampsia, which was followed by malpresentations(15.8%).Preterm labour was seen in 10.52% subjects while IUGR was seen in 5.26%patients.Posterior and anterior placentae had higher incidence of IUGR(29.40% and 18.75% respectively).Malpresentations was most common in patients with low lying placenta(42.87%).Among the fundal placenta, majority(22.22%) had IUGR, while pre eclampsia, and preterm labour were seen in 11.11% patients each. Subjects having posterior placenta, 17.64% had preterm labour, 5.88% had malpresentation, 5.88% had pre eclampsia. In subjects with anterior placenta, 12.50% had preterm labour, 12.50 % had malpresentation and6.25% had pre eclampsia, Of patients with low lying placenta, 28.57% had preterm labour, 14.28% had IUGR, 14.28% had pre eclampsia. Pregnancy outcomes according to placental location has been summarised in Table 3. No complications(normal or uneventful outcome) was most commonly seen in patients with fundal placenta (55.56%) followed by patients with anterior placenta (50%) and posterior placenta (41.20%). Very few patients with lateral placenta had normal outcome(10.52%). No patient having low lying placenta had normal or uneventful outcome because of increased incidence of malpresentations, preterm labour and associated complications. By Chi square test, it was observed that there is significant association between placental location and pregnancy outcome($p<0.0004$**).

Table 1: Distribution of study subjects according to age

Age group	Patients with previous caesarean section	
	Number	%
<20yrs	2	2.67
21-25yrs	40	53.33
26-30yrs	24	32.00
31-35yrs	9	12.00
Total	75	100.00

Table 2: Distribution according to location of placenta

Placental loacation	Number	%
Anterior	16	21.34
Posterior	17	22.67
Fundal	9	12.00
Lateral	19	25.34
Low lying	14	18.65
Total	75	100.00

Table 3: Distribution according to location of placenta and pregnancy outcome.

	Placenta location									
	Anterior		Posterior		Fundal		Lateral		Low lying	
	Nor	%	Nor	%	Nor	%	Nor	%	Nor	%
IUGR	3	18.75	5	29.40	2	22.22	1	5.26	2	14.28
Preeclampsia	1	6.25	1	5.88	1	11.11	11	57.90	2	14.28
Preterm	2	12.50	3	17.64	1	11.11	2	10.52	4	28.57
Malpresentations	2	12.50	1	5.88	0	0	3	15.80	6	42.87
Normal	8	50.00	7	41.20	5	55.56	2	10.52	0	0
Total	16	100.00	17	100.00	9	100.00	19	100.00	14	100.00

DISCUSSION

During routine antenatal ultrasonography, assessment of placental location is often theoretical without formulating any association to its possible implications on pregnancy and childbirth. On the same hand the rate of caesarean sections is on rise. Scarred uterus is said to influence the placentation site. So we conducted this study to speculate if different sites of placental location may have a role in influencing the pregnancy outcome in patients with previous caesarean section. In our study, the mean age and standard deviation of the study subjects was 26.01 ± 3.22 years which was comparable to the results of the studies conducted by Jaisal P *et al* and Faizi *et al*.[3,4] Our study had majority of patients with lateral placenta(25%) followed by posterior(22.67%) and anterior(21.34%). Ambastha *et al* and Gonser M. *Et al* also reported maximum subjects with lateral placenta in their respective studies while Faizi S had majority of anterior placenta(44.1%) followed by posterior(27.2%).[5,6] In our study, pre eclampsia was more common (57.90%) in patients with lateral placentae which supports the hypothesis that placenta plays vital role in the pathogenesis of pre eclampsia. Gonser M *et al* also concluded that patients having lateral placentae had significantly increased incidence of pre eclampsia. This is also supported by the analysis by Fung *et al*.[6,7] Faizi *et al* also found pre eclampsia to be more common in lateral placentae(27.9%), which was statistically significant. Our study also has results comparable to these studies. It has been postulated that when placenta is located laterally, there is lower resistance in the uterine artery closer to the placenta compared to the opposite one. Hence the utreoplacental blood flow needs are not met by equal contribution from both uterine arteries. This deficient contribution may facilitate the development of pre eclampsia, IUGR or both. Also there is inadequate cytotrophoblastic invasion in laterally placenta which again explains the development of preeclampsia.[8,9,10] Our patients with posterior and anterior placentae had highest incidence of IUGR (29.40% and 18.75% respectively). Jaisal P. et *al* reported 31.71% and 14.6% IUGR in patients with anterior and posterior placentae respectively but did not find any statistically significant association of IUGR with unilateral placenta. While the study by Kalanithi LE *et al* reported that IUGR pregnancies were nearly 4-fold more likely to have lateral placentation (odds ratio, 3.8; 95% confidence interval, 1.3-11.2) compared with anterior or posterior placentation.[11] In the study done by Chabbra S *et al*, 0.5% women with anterior placenta,14.6% with posterior placenta and 10.6% with

fundal placenta had preterm births; and there was no significant difference among the three groups (P<0.001).[12] In our study, 12.5% women with anterior placenta,17.64% with posterior placenta and 11.11% with fundal placenta had preterm births. However highest incidence of preterm birth were seen in low lying placentae (28.57%). In the present study fetal malpresentation had much higher incidence in patients having low lying placenta (42.87%) as compared to other placental location. Our finding is consistent with Senkoro *et al*, who reported 3 fold higher incidence of mal presentation in low lying placenta patients. The association between placenta previa and fetal mal presentation may be explained by the fact that the placenta in the lower segment obstructs the engagement of the head; this may cause the transverse or breech lie in the womb.

CONCLUSION

From our study we came to the conclusion that among the various sites of placental location, lateral placentation is more associated with pre eclampsia, and the low lying placenta with malpresentations. We found significant association between placental location and pregnancy outcome(p<0.0004**) in patients with previous CS. Hence placental implantation can be used to predict pregnancies at risk for adverse antepartum and intrapartum outcomes in patients with previous CS.

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Source of Support: None Declared
Conflict of Interest: None Declared