

A STUDY OF MIGRATION OF LOW LYING PLACENTA IN A TERTIARY INDIAN HOSPITAL

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ABSTRACT Context of the study: Low lying placenta alarms obstetrician about antepartum haemorrhage which is a major cause of maternal mortality and morbidity in India. The incidence is increasing with availability of antenatal scan, elderly mothers, repeated usage of dilatation and curettage and high rate of Caesarean sections in tertiary hospitals. **AIM OF THIS STUDY** was to find out the incidence of placental migration in the present study and factors influencing the same. **SETTING AND DESIGN:** The study was done in Kolkata Medical College during July 2007 to June 2008. It was a prospective longitudinal study. **MATERIALS AND METHODS:** Total 726 antenatal mother was attended in this study at Kolkata Medical College. Sixty mothers had low lying placenta by transabdominal scan confirmed by transvaginal scan. **STATISTICAL ANALYSIS:** Data were put on Microsoft excel chart. Percentage and p value were calculated using statistics software Epi info. **RESULTS:** The incidence of low lying placenta in our study was 8.26%. Subsequent sonography at four weeks interval showed placenta was moving more than three centimeter from internal os among 41 mothers. The rate of placental migration was 68.3% in the present study. The prevalence of placenta praevia at term was 2.61%. Age had no relationship but increasing parity of mother and increasing number of abdominal deliveries had direct relationship with low lying placental incidence. When the distance between leading edge of placenta and internal os was less than 1.5 centimeter, placental migration was not seen. About 88.23% cases placental migration was seen when the distance was more than 2 centimeter. Posterior placenta had more rate of migration (81.81%) than anterior. **CONCLUSION:** Migration of low lying placenta was influenced by maternal age, parity, mode of delivery and position of the placenta.

KEY WORDS: Placental migration, Low lying placenta, Transvaginal sonography

MeSH Terms- Placentation

INTRODUCTION: Low lying placenta is a common observation at the routine obstetrics in midgestation. The incidence of low lying placenta is increased significantly due to midgestational fetal anomaly scan. Ultrasound scans in second trimester alarms obstetricians about the possibility of placenta remaining in the lower segment and its association with maternal and fetal morbidity & mortality. When going through literature, the incidence of low lying placenta, sonographically diagnosed in the second trimester ranges from 6% to 46%. This rate however decreases to as low as 0.5% at delivery¹. The less incidence of low lying at term can be explained by the concept of placental migration which is a positional change of the placenta from the lower segment to the upper segment due to the net result of differential growth of placenta towards well vascularized fundus and degeneration of peripheral villi in the lower uterine segment that receives less blood supply and the differential growth rates of lower segment of the uterus and placenta. This high rate may be due to over-distended bladder during trans-abdominal sonography. Transvaginal USG (TVS) is well established, safe and accurate method of placental localization and is superior to transabdominal USG. TVS has Positive predictive value of 93.3% and negative predictive value 97.6% in case of placental localization².

The background of this study is unique because till now there is very few studies regarding placental migration all over the world and there is no study in Indian subcontinent except one study in South India. The aim of the study was to evaluate the phenomenon and the factors influencing placental migration.

MATERIALS &METHOD: The present study was conducted on all pregnant women attending antenatal clinic of Kolkata Medical College& Hospital, Kolkata from July 2007 to June 2008. The study was **approved by ethics committee of the institution**. It was a prospective longitudinal type of observational study. Mothers were explained the whole procedure in their vernacular language. Informed consent was taken. Detailed history regarding age, duration of marriage, socioeconomic condition including literacy status, family income, residential status and obstetric history were recorded.

Routine transabdominal USG were done at 18-20 weeks of gestation to all mothers and those having low lying placenta had undergone transvaginal sonography using 5 MHZ probe(Agilent Image Point Hx) after ensuring empty bladder. Inclusion criteria of this study was singleton pregnancy in between 18-20 weeks. Exclusion criteria were 1) Multiple pregnancy 2) Diabetes in pregnancy 3) Pregnancy >20 weeks and <16 weeks 4) known case of foetal anomaly 5) Missed abortion / intrauterine foetal death 6) Rh blood group incompatibility.

The line of cervical canal was visualized and the distance between the center of the internal os and the leading edge of placenta was measured. An average of three measurements was taken to calculate the distance in centimeters. Antenatal women with low lying placenta i.e. the distance between the leading edge of placenta and the internal os of less than 3 cm at 18-20weeks were included in the study. TVS was repeated every four weeks until the lower edge of the placenta migrated beyond 3cm or the patient had delivered, whichever is earlier.

RESULT: The result was put on Microsoft Excel chart and result analysis was done by statistical Software Epi info.

A total of 726 antenatal mothers underwent transabdominal sonography around 18-20 weeks of gestation to identify low lying placenta out of which 60 women had low lying placenta

confirmed by TVS. The prevalence of low lying placenta in early mid-trimester was 8.26%. 61.3% of patients were asymptomatic. Follow up USG of these 60 patients of low lying placenta showed that in 41 cases the placenta had migrated beyond 3 cm from the internal os in the subsequent sonography or at term (Table 1). This resulted in the prevalence of placenta praevia to be 2.61% around term.

The rate of placental migration was 84.61% in woman with previous vaginal deliveries when compared with women having previous cesarean section 43.75% and women with prior ERPC/MTP (54.54%) (Table 2).

Statistically significant ($p=0.001$) influence of age was observed. Greater incidence of placental migration was seen in younger mothers (Table 3).

Considering the placental migration in relation with gravidity of the mothers, statistically significant ($p=.0011$) decrease in rate of migration of placenta was found with increase in gravidity of the mothers.(Table 4).Incidence of placental migration among primigravida mothers was 51.2% whereas among the fourth gravida mothers it was observed to be 2.4%.

The rate of placental migration was highest that is 88.23% (30/34) where the initial distance between the lower edge of the placental and the internal os was more than 2cm.Only 68.25% (11/16) migration was observed where the distance was in the range of 1.5-2cm. None of the low-lying placenta showed migration where the initial distance was less than 1.5cm (Table 5).

Anteriorly situated low lying placenta showed lesser migration 60.52% (23/38) when compared with posteriorly situated placenta 81.81% (18/22) (Table 6).

DISCUSSION: The diagnosis of low lying placenta in the midtrimester obstetric ultrasound scan has considerably increased in the present scenario due to elderly mothers and increased frequency of Caesarean sections. Our present study showed the prevalence of low lying placenta in early mid trimester was 8.26% which corresponds with ShrivageJyotsna(8.08%)³ but it is higher than Tiapale⁴ who reported the prevalence of 4.5%. The factors responsible for this may be due to more use of ultrasonography for placental localization at 18-20 weeks along with anomaly scan which is safe and gold standard. The other causes may be due to more multipara women with prior Caesarean section or dilatation and curettage were attending in the present study population.

Women with prior Caesarean section are more likely to have increased incidence as well as persistence of low lying placenta. It has been suggested that damage to the endometrium during Caesarean section predisposes to low implantation of the placenta and also impairs the ability of placenta to migrate .Women with at least one prior Caesarean section were 2-6 times at greater risk for development of placenta praevia in the subsequent pregnancy and in women with prior MTP the risk was 1.7 times greater⁵. From a large multicenter study in Nigeria, it was revealed that, the incidence of placenta praevia increases in a linear way with number of previous Caesarean section⁶.A retrospective analysis of 292 cases of placenta praevia by Clark and colleagues showed an incidence of 0.26% in an unscarred uterus, 0.65% after one Caesarean section, rising to 10% in women with four or more abdominal deliveries⁷. The risk is highest in pregnancy immediately following Caesarean section. Our study also proved the same.

Placental migration depends `mainly on the initial distance between the lower leading edge of the placenta and the internal os. Our present study also corroborated the same. One large multicenter study regarding etiology of placenta praevia in Croatia came in conclusion that it was more common among multigravida⁷ and our present study corroborates with this. Though advancing maternal age and tobacco usage⁸were risk factors of placenta praevia but in

the present study we were unable to find any relationship. The migration rate was maximum when the distance was more than 2 centimetre⁹. The rate of migration was nil when the distance of the leading edge was less than 1.5 centimetre. In the present study, placental migration was observed more in posteriorly situated placenta compared with anterior which is contrary with other reports except with ShrivageJyotsna³. This may be due to increased incidence of Caesarean Section in tertiary care medical college or due to more mothers attending antenatal clinic with history of previous Caesarean Section in the study. Frequency of placenta praevia at term or delivery ranges from 0.29% -1.24%^{10, 11, 12} in different literature but it is lower than the present study. These may be due to the same factors.

Low lying placenta warns obstetrician for more detailed follow-up sonography. 68.3% mothers had migration of placenta at or before term. Multiparity, previous Caesarean section and dilatation and curettage are known risk factors of placenta praevia. Distance between leading edge of the placenta and internal os of cervix less than 1.5 cm concerns obstetrician about placenta praevia.

Limitation of this study was short time period of observation. Prolonged longitudinal study for few years may be needed in this field along with outcome of mothers and babies. As it was done in a tertiary hospital, number of post-Caesarean pregnant mother was more compared with general population.

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Table 1: Prevalence of low lying placenta at midtrimester and rate of placental migration

No of mid-trimester low lying placenta	No of low lying placenta at delivery term	Rate of placental migration
60 (8.26%)	19	68.3%

Table 2: Relation between previous pregnancy outcome and placental migration

Previous pregnancy events	No of midtrimester low lying placenta	No of placental migration	Percentage of migration
Vaginal delivery	26	22	84.61%
Caesarean section	16	7	43.75%
ERPC	11	6	54.54%
Manual removal of Placenta	7	6	85.71%

Table 3: Placental migration in relation to age

Placental migration	Age (in years) Mean ± SD	p value
Yes (41)	22.24 ± 4.01	p=0.001
No (19)	28.47 ± 3.35	

Table 4: Placental migration in relation with gravidity of mother

Placental migration	Gravida				
	1	2	3	4	5
Yes (41)	21 (51.2%)	17 (41.5%)	2 (4.9%)	1 (2.4%)	0
No (19)	4 (21.1%)	6 (31.6%)	3 (15.8%)	3 (15.8%)	3 (15.8%)

Placental migration	Gravida mean ± SD	p value
Yes (41)	1.59±0.49	0.0011
N (19%)	2.73±1.00	

Table 5: Placental migration in relation to initial distance from internal os

Initial distance	No of midtrimester low lying placenta	No of placenta migrated	Percentage migrated
<1.5cm	10	00	00
1.5 - <2cm	16	11	68.75%
2-3cm	34	30	88.23%

Table 6: Placental migration in relation to the position of placenta

Position	No of midtrimester low lying placenta	No of placenta migrated	Percentage migrated
Anterior	38	23	60.52%
Posterior	22	18	81.8%