ORIGINAL ARTICLE

Sonographic Assessment of Placenta Previa with and without History of Cesarean Section or Abortion

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ABSTRACT

Background: The incidence of placenta Previa has increased with increasing maternal age due to late marriages.
Objective: To assess occurrence of placenta Previa in females with and without history of C- section, abortion and both.
Methodology: Descriptive cross sectional study conducted in Sir Ganga Ram Hospital Lahore, radiology department. Duration of study was nine months after the approval of synopsis. Main aim was to assess occurrence of placenta Previa in females with and without history of C-section and abortion or both. The examination will start with the patient in the supine position (3.5 – 5 MHz) convex probe will be used .From the anteriorly using urinary bladder as acoustic window ultrasound will be performed in the longitudinal planes. In Transabdominal study (TAS) the bladder will be adequately distended to visualization of the cervix and lower uterine segment and to check the relationship of the placenta to the inner os. If indicated, positioning the patient in a right or left posterior oblique position may be helpful to check the posterior placenta. The diagnosis of placenta Previa will be considered if the lower placental edge covers the internal os.
Results: In antenatal setup 357 pregnant females were scanned in their second and third trimester for fetal growth and placental position and location after taking obstetrical history and clinical examination. After completion of the nine months of data regarding the complete obstetrical and surgical history were noted in a performa/questionnaire and analyzed using SPSS. The study found that 90 females were diagnosed as cases of placenta Previa with both H/O C- section and abortion. The Mean and SD value of maternal age of 357 pregnant females were 29.78 and 3.42. Data was classified into 2 groups: <29 years and >29 years of maternal age. Cross tabulation was developed between age groups and history of C- section, abortion or both. Mean and SD values < 29 years maternal age were 26.82and 1.03, Mean and SD value >29years maternal age were 31.99and 2.86. It was clear from the study that placenta Previa is associated with old C-section, abortion and both. There is association increasing maternal age chances of Placenta Previa increased (P=0.000 <0.05) P VALUE 0.000, OR=2.75, CI=1.633---4.759.The study concludes that ultrasound is best modality to diagnosis placenta Previa.
Conclusion: In this study we determined the chances of placenta Previa increase with Maternal age, H/O previous C- section , H/O abortion and both H/O C-section, abortion .We found significant P VALUE 0.000, Odds ratio 2.76, Confidence interval 1.633---4.76. Hence we can conclude that USG is a reliable and sensitive modality for the placenta Previa localization.
Keywords: placenta Previa, abortion, placenta localization

INTRODUCTION

The total or halfway covering of the inner os of the cervix with the placenta is called placenta Previa. There are harmful conditions for both mother and kid due to low lying placentas and halfway covering placentas. Main reasons of mother hemorrhage and baby complexities like prematurity and vasa previa.[1]This condition stop a safe vaginal birth and there is need the delivery of the new born to be through C-section. [2] During pregnancy improvement of both mother and fetal results to diagnose low positioned placentas. Be that as it may, because of 'placental migration', in the 3rd trimester 90 percent of females with a placenta Previa or low lying placenta in the 2nd trimester will never again have this condition. Two groups of placenta Previa: Major placenta Previa: placenta total approach the inner cervical os. Minor placenta Previa placenta is down however does not touch\approach the inner os of cervix. [3]The fundamental gamble factor for placenta Previa is past C-section. Incidence association 1 out of 160 with 1 past c- section and this increases to 1 out of 60 with 2 past c- sections, 1 out of 10 with 4 C-sections. There are other gamble factors: increase parity, Mother age >40 years multiple times history of placenta Previa, past history of uterine infection, D and C after miscarriage or abortion[4]. At 28–32 weeks' gestation to determine for vasa Previa transvaginal ultrasound with color and pulsed Doppler are helpful.[5]

In many cases various techniques for re-assessment and follow up in the 3rd trimester will affirm normal placental position. In the 2nd trimester other expense to investigate, analysis of a low lying placenta [6]. In the 3rd trimester females will have a low-positioned placenta that has high risk for mother and fetal complexities. In second trimester low situated placentas that have a position towards the fundus in the third trimester an orderly survey and meta-analysis is helpful.[7] In the 2nd and 3rd trimester the distance between Low-positioned placentas to an internal os is less than 20 mm. Placenta Previa classifications as a low position placenta marginal or partial covers the inner cervical os and complete covers the internal os.[8] Grade 1: low-position placenta: placenta lies in the lower uterine segment yet its lower margin does not close the inner os of cervix. Grade 2 Marginal Previa: placenta arrives at the edge of the inner cervical os, yet does not close it. Grade 3: Partial Previa: placental tissues to some extent close the inner cervical os. Grade 4: Total Previa: placenta totally closes inner os.[9] Placenta Previa is an obstetric complication in the 3rd trimester placenta abnormal position covering the inner cervical os. Nonetheless, with the technologic progresses in ultrasound, placenta Previa diagnosis is commonly made prior in pregnancy[10]

Sensitivity of MRI is more than Ultrasound for the diagnosis of myometrial invasion and the abnormal placentation Grading (respectively 73.5% and 47 %,). For diagnosis abnormal placentation Ultrasound is more accurate imaging modality.[11]The gamble increments with number of earlier C-sections delivery and association between past C-section delivery, abortion, and the succeeding development of placenta Previa. [12] There are multiple complications of placenta Previa like bleeding , Emergency caesarean delivery, Shock due to loss of blood, Fetal distress, Premature birth and labor pain, if birth prematurely health related issues blood loss and Death. [13]Many techniques of investigations are used Placenta Previa is diagnosed through ultrasound, placenta Previa is frequent complains in the emergency of obstetrics and gynecology. During a second trimester ultrasound exam most cases of placenta Previa are diagnosed. Ultrasound and different types of other radiological modalities are helpful for diagnosis. Longitudinal images best describes the relation of the placenta to the inner os of the cervix. So, ultrasound effectively accessible than MRI.

MATERIAL AND METHODS

Study Design: Cross sectional, Descriptive
Settings: Sir Ganga Ram Hospital Lahore, Radiology Department.
Duration of Study: 9 Months after the approval of synopsis.
Sample Size: Following formula is used to calculate sample size:

$$n = \frac{z^2_{\left(1-\frac{\alpha}{2}\right)}pq}{d^2} \qquad \therefore q = 1 - p$$

Sample size is calculated at 95% level of significance and at 5% margin of error.

The incidence of placenta Previa in C-section or abortion 74.5%[46] and 26.5% respectively.

P=0.745
d = 0.05
74.5/100=0.745
z^2
1-α/2=1.96 at α= 0.05
n= (1.96)2   (0.74) (1-0.74)/ (0.05)2
=3.84(0.74) (0.255)/0.0025

n=291

In 9 months, total numbers of females 357 were scanned and observations of all were included for data analysis.

Sampling Technique: Consecutive sampling
Sample Selection:
Inclusion Criteria:
• Singleton Pregnant patients with placenta Previa age group 20 to 45years
• 2nd and 3rd trimester pregnancy and patients with history of cesarean section or abortion or both with parity 2.
Exclusion Criteria:
• Uterine fibroids and other complications like congenital abnormalities (heart defects, neural tube defects and Down syndrome).
• Twin pregnancy
Equipment: Toshiba Aplio 50, Toshiba Aplio 300, Toshiba Nemio 10.
Technique: The examination will start with the patient in the supine position, with frequency range 3.5 – 5 MHz convex probe will be used .Scans will be performed in the longitudinal planes. For Trans abdominal study (TAS), Urinary bladder will be adequately distended to check the cervix and lower uterine segment and to see the relationship of the placenta to the internal os. If indicated, positioning the patient in right or left posterior oblique position may be helpful in visualizing a posterior placenta. The diagnosis of placenta Previa will be considered if the lower placental edge covers the internal os.
Data Collection Procedure: After taking written consent, data have been collected with the help of data collection sheets and questionnaire. Data have been collected according to the variables of the questionnaire which are as follows

Clinical features including previous history of c- section and abortion.

Presence or absence of placenta Previa have been recorded. Data have been stored in SPSS 25.0. and excel.
Data Analysis Procedure: SPSS 25.0. was used to analyzed qualitative data like presence of placenta Previa, history of C-section or abortion and Placenta position were reported in frequency and percentages. Age of female patients were reported in Mean and ± S.D.

P- Value < α = 0.05 P- Value <0.05 has considered as significant.

P Value = 0.000
Odds ratio 2.76
Confidence interval 1.633---4.759

RESULTS
The total numbers of female patients were 357 and their average age was 29.8 with SD of 3.41 as shown in Table No 1.
Data was classified into two groups: Below 29years and above than 29 years of maternal age. Cross tabulation was developed between age groups and history of C- section, abortion and both.

The majority of patients were more than 29 years old. 204 patients were found more than 29 years old and 153 patients were found less than 29 years of age. Less than 29 maternal age mean and SD value are 26.82 and 1.033.Greater than 29 maternal age mean and SD value are 31.99 and 2.85 as shown in Table No 2.

Table 1: Mean and SD Value of maternal age

Descriptive Statistics							
	N	Range	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Age	357	19.00	24.00	43.00	29.7787	.18091	3.41819

Table 2: Maternal age Groups

Age in Groups	Mean	N	Std. Deviation	Minimum	Maximum
< 29	26.8235	153	1.03312	24.00	28.00
> 29	31.9951	204	2.85874	29.00	43.00
Total	29.7787	357	3.41819	24.00	43.00

The association of placenta Previa with H/O C-section. Total number of patient 101 out of 357 have no history of c section but 256 patients out of 357 have history of c- section as shown in Table No 3

Table 3: H/O C-SECTION

History of C- Section			
		Frequency	Percent
	NO	101	28.3
	YES	256	71.7
	Total	357	100.0

The association of placenta Previa with H/O Abortion. Total number of patients were 241 out of 357 have no history of abortion but 116 patients were out of 357 have history of abortion as shown in table no 4

Table 4: H/O ABORTION

History of Abortion			
		Frequency	Percent
	NO	241	67.5
	YES	116	32.5
	Total	357	100.0

Table 5: H/O both C-section and abortion

History of both C-section and abortion		
	Frequency	Percent
286	80.1	
71	19.9	
357	100.0	

The association of placenta Previa both with H/O C-section and abortion. Total number of patients were 266 out of 357 have no both history of C-section and history of abortion but 71 patients were out of 357 have both history of c section and abortion as shown in table no 5.

Table 6: placenta Previa grading

		Frequency	Percent
	0	261	73.1
	1	42	11.8
	2	10	2.8
	3	16	4.5
	4	25	7.0
	5	1	.3
	6	1	.3
	7	1	.3
	Total	357	100.0

The placenta position anterior / posterior, posterior low lying, anterior frequency was 229 out of 357, posterior frequency was122

out of 357 and posterior low lying was 6 out of 357 as shown in table no 7

Table 7: placenta position

Placenta Position Anterior/Posterior		
	Frequency	Percent
Anterior	229	64.1
Posterior	122	34.2
Posterior low lying	6	1.7
Total	357	100.0

The number of gravida and percent of gravida are shown in table no 8.

Table 8: Gravida

		Frequency	Percent
	10	1	.3
	11	1	.3
	12	1	.3
	2	87	24.4
	3	84	23.5
	4	83	23.2
	5	48	13.4
	6	30	8.4
	7	16	4.5
	8	3	.8
	9	3	.8
	Total	357	100.0

The parity frequency and percent values as shown in table no 9 .

Table 9: Parity

Parity			
		Frequency	Percent
	0	1	.3
	1	109	30.5
	2	108	30.3
	3	81	22.7
	4	39	10.9
	5	9	2.5
	6	7	2.0
	7	1	.3
	8	1	.3
	9	1	.3
	Total	357	100.0

The gestational weeks >20 to < 45and placenta positions.

Table 10: Cross tabulation b/w weeks and placenta position

Cross tabulation between Weeks and PLACENTA POSITION ANTERIOR/POSTERIOR as shown in table no 10.				
		Anterior	Posterior	Posterior Low Lying	Total
Weeks	22.00	1	0	0	1
	23.00	0	2	0	2
	24.00	0	2	1	3
	25.00	1	3	1	5
	26.00	2	1	1	4
	27.00	0	3	1	4
	28.00	0	2	0	2
	29.00	0	1	0	1
	30.00	0	2	0	2
	32.00	0	2	0	2
	33.00	1	2	0	3
	34.00	2	7	0	9
	35.00	14	11	0	25
	36.00	57	17	2	76
	37.00	81	33	0	114
	38.00	54	27	0	81
	39.00	9	6	0	15
	40.00	7	1	0	8
Total		229	122	6	357

P VALUE 0.000
Odds ratio 2.76
Confidence interval 1.63---4.76
Data was analyzed by SPSS.

The mean and SD of maternal age of 357 pregnant females were 29.78 and 3.42.Data was classified into 2 groups: < 29 years and >29 years of maternal age. Cross tabulation was developed between age groups and history of C-section, abortion and both. Odds ratio was 2.76 (Confidence Interval= 1.63-4.76) with P value 0.000.It was concluded that females greater than 29 years have more chances of placenta Previa if they had past history of C-section ,abortion or both. However, occurrence of placenta Previa has high with increasing maternal age due to late marriages.

DISCUSSION

Placenta Previa and low position placentas are unsafe conditions for both mother and kid. To diagnose low positioned placentas during pregnancy it is important for mother and fetal health.[4] Gamble factors are increase parity, mother's age greater than 40 years, past placenta Previa, history of uterus infection, D and C after miscarriage or pregnancy loss.[48]

Many techniques are using to check the Placenta Previa through ultrasound after complain of (PV) per vagina bleeding. Many instances of placenta Previa are diagnosed during a 2nd trimester ultrasound exam. Longitudinal ultrasound images best describe the association of the placenta to the inner os. However, ultrasound easily accessible than MRI.[49]

Samika K, et al reported in 2010 progressed mother's age, past miscarriages, D and C and H/O past C-section higher the occurrence of placenta Previa. In current Study shows total number of maternal patients were 357 and all maternal patients' age mean and SD value were 29.78 and 3.42.

In 2016 Dr V N Kurude,et al. In their study period total no. of instances of placenta previa were 61and 0.05% of total cases. Age group 20 to 30 years, 78% female, and multipara are 83% cases They concluded that placenta Previa is associated with high mother's morbidity and side effects of perinatal outcomes.

The sonographic assessment of placenta Previa both with H/O C–section and abortion. Total number of patients were 266 out of 357 has not both history of C-section and history of abortion but 71 were out of 357 has both history of c section and abortion. The sonographic assessment of placenta Previa with history of C-section. Total number of study subject were 101 out of 357 has not history of C-section but 256 study subject were out of 357 have history of c- section. The sonographic assessment of placenta Previa with history of abortion. Total number of patients were 241 out of 357 have not history of abortion but 116 study subject were out of 357 have history of abortion. Total numbers of maternal patients were 357 and all maternal patients' age mean and SD value were 29.78 and 3.42.Data was analyzed into two groups: Mean and SD value below 29 years maternal age were 26.82 and 1.03.Mean and SD value above 29 years maternal age were 31.99 and 2.85.

P VALUE 0.000 Odds ratio 2.757
Confidence interval 1.633---4.759

CONCLUSION

It was clear from the study that placenta Previa is associated with past C-section, abortion and both. Increasing maternal age chances of Placenta Previa increased (P = 0. 000 <0.05).

P Value = 0.000
Odds ratio 2.75
Confidence interval 1.63---4.75

This study concludes that ultrasound is best modality to diagnose placenta Previa.

Recommendation

1. Descriptive cross sectional study with small sample volume. Further longitudinal studies should be done with larger sample sizes.

2. Further studies should be done by comparing results of USG and MRI for accurate assessment of placenta Previa.

Limitation:
1 Small sample size
2 Lack of Gold Standard test

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