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*Research Article*

## STUDY OF CONTRIBUTING FACTORS OF PLACENTA PREVIA IN PREGNANT WOMEN AT TERTIARY CARE HOSPITAL

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**Abstract:**

**Objective:**

- 1 To determine the frequency of contributing factors (multiparity and previous caesarean section) of placenta previa in pregnant women.
- 2 To determine outcome in females presenting with placenta previa in a tertiary care hospital.

**Material and methods:** This descriptive case series study was conducted at Department of Obstetrics & Gynaecology, Bahawal Victoria Hospital, Bahawalpur from October 2018 to April 2019 over the period of 6 months.

**Results:** Mean age of patient was 27.32±3.23 years. Previous caesarean section was a contributing factor in 47(39.16%) women out of 120. Multiparity was found in 69 (57.5%) women.

Postpartum hemorrhage occurred in 18 (15%) and hysterectomy was done in 4 (3.33%) women.

**Conclusion:** Multiparity and previous caesarean section is significant contributing factors for development of placenta Previa and postpartum hemorrhage and subsequent hysterectomy are the serious outcome. Efforts must be made to avoid unnecessary caesarean section and advise the patient about family planning.

**Key words:** Placenta previa, Caesarean section and Postpartum hemorrhage.

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**INTRODUCTION:**

Placenta Previa is defined as abnormal insertion of placenta partially or completely in lower uterine segment. The incidence of placenta previa diagnosed during the pregnancy is 0.5 to 0.7 %.<sup>1-2</sup> Placenta previa is associated with poor maternal and fetal outcome because it provides essential connection between the mother and developing fetus.<sup>3-4</sup>

The neonatal mortality associated with placenta previa is above 10 percent<sup>4</sup>. There is an increase in the incidence of neonatal complications like, preterm birth<sup>32-50%</sup><sup>2,4</sup>, low birth weight<sup>27-33.3%</sup><sup>2,4</sup> major congenital anomalies 1.4% like respiratory distress syndrome and anemia associated with placenta previa. The prenatal mortality rate associated with placenta previa is above 10%.<sup>4</sup>

Ante-partum hemorrhage complicates 2-5% of all pregnancies which has various causes, up to one third are due to placenta previa. It has been previously thought that placenta previa is associated with intrauterine growth restriction but more recent studies do not support this thought. The reduction in fetal growth rate may be due to ante-partum hemorrhage.<sup>5</sup>

A major cause of obstetric morbidity and mortality is Placenta previa throughout the world. Maternal mortality rate associated with placenta previa is 0.7%.<sup>9</sup> Complete or partial placenta previa have higher morbidity as compared to low lying or marginal placenta previa. Multiparity 61.4 %<sup>4</sup> to 66.7%<sup>2</sup>, increasing number of abortions 28.6%<sup>2</sup>, history of smoking 7.06%<sup>6</sup> and history of previous cesarean section 22.8% to 64%<sup>3</sup> and previous curettage 15.2%<sup>6</sup> are important risk factors for the development of placenta previa.

The investigation of choice for evaluation of Placenta previa is ultrasonography. When it detects placenta previa in asymptomatic non bleeding cases it is highly sensitive diagnostic tool. It may be life-saving both for mother and the fetus. The most accurate method for localizing and diagnosing for Placenta Previa is transvaginal sonography (TVS) because it can utilize higher frequencies of ultrasound and provide better resolution of the inferior margin of the placenta. Hence depending on availability TVS must be used to investigate the placental location at any time during the pregnancy when placenta is thought to be low-lying.<sup>7</sup>

As the rate of caesarean section delivery rate has increased throughout the world, pregnancy after cesarean section is associated with increased risk of placenta previa.<sup>8</sup>

As there are significant differences in contributing factors (multiparity and cesarean section) and outcome (postpartum hemorrhage and subsequent hysterectomy rate) of placenta previa in local and international studies, we have plan this study to resolve these controversies and such extensive study has never been done in our population.

**OPERATIONAL DEFINITIONS****PLACENTA PREVIA**

Placenta previa is insertion of placenta in lower uterine segment diagnosed on ultrasonography. Grade I placental edge is away from internal os. Grade II placenta is located at margin of internal os. Grade III placenta partially covers the internal os. Grade IV placenta completely covers the internal os. Any grade was considered as placenta previa.

**CAESAREAN SECTION**

It is a surgical operation in which incision is given through mother,s abdomen and uterus to deliver baby. It will be confirmed by taking history and examining the previous surgical scar.

**MULTIPARITY**

It is a condition of having more than one child to a mother.

**POSTPARTUM HAEMORRHAGE**

It is amount of blood loss  $\geq 1000$  ml occurring from genital tract from time of delivery till first 24 hours. Amount of blood loss that will be measured (in ml) from delivery of fetus to 24 hours after delivery, by collection of immediate blood loss in kidney tray having capacity of 500ml and later on using 3x11x1 inches sized pads. Completely saturated pad holds 80ml of blood and 50% saturated pad holds 25ml blood.

**HYSTERECTOMY**

It is surgical removal of uterus as a last resort in case of excessive hemorrhage ( $\geq 2500$ ml of blood) in case of failed medical management.

**MATERIALS AND METHODS:**

This descriptive case series study was conducted at Department of Obstetrics & Gynaecology, Bahawal Victoria Hospital, Bahawalpur from October 2018 to April 2019 over the period of 6 months. Total pregnant 120 women were selected for this study.

**INCLUSION CRITERIA:**

- 1 Pregnant ladies with any grade of placenta previa diagnosed on ultrasonography with finding of insertion of placenta in lower uterine segment.
- 2 Age between 16-40 years.
- 3 Gestational age 37-42 weeks confirming on ultrasonography.

**EXCLUSION CRITERIA**

- 1 Placental abruption was diagnosed by tender, hard, large uterus and clot at vagina on clinical examination and periplacental hemorrhage on ultrasonography.
- 2 Medical disorder like chronic hypertension diagnosed on sphygmomanometer having blood pressure >140/90 on two occasions.

**DATA COLLECTION PROCEDURE**

The study was approved from hospital ethical committee. Pregnant ladies fulfilling the inclusion criteria were admitted in Obstetric & Gynecology ward were included in study. The procedure was explained to each case and written informed consent was obtained. Brief history was taken for multiparity and previous caesarean section.

The outcome was seen by measurement of blood loss started from delivery of fetus. The immediate blood loss (in ml) was measured in kidney tray and one kidney tray was equal to capacity of 500ml. The patients were given 3×11×1 inches sized standard pads. The pads which appeared 50% saturated, were containing 25ml blood and perineum pads completely saturated were holding approximately 80ml of blood. A blood loss of ≥1000 ml was termed as postpartum hemorrhage. Hysterectomy was performed in case of blood loss of ≥2500 ml. All information were calculated and recorded on preformed Performa.

Data was analyzed by SPSS version 10. Mean and standard deviation were calculated for quantitative variables like age. Frequencies and percentages were calculated for qualitative variables like multiparity, previous caesarean section, postpartum hemorrhage and hysterectomy. Effect modifier were controlled by stratification of data with reference to age, parity, number of previous caesarean sections and grade of placenta previa. Post-stratification Chi-square test was applied to see the effect and p-value <0.05 was taken as significant.

**RESULTS:**

In this present study 120 women with placenta Previa were included. Placenta Previa was diagnosed on Transvaginal ultrasonography. Mean

age of women was  $27.32 \pm 3.23$  years. Stratification with respect to age of PPH was done and 3 age groups were made. Age group 20-25 years, age group 26-30 years and age group above 30 years. Out of 42 (35%) patients of age group 20-25 years, PPH was observed in 5 (11.90%) patients. Out of 56 (46.67%) patients of age group 26-30 years, PPH was noted in 9 (16.07%) patients. Out of 22 (18.33%) patients of age group above 30 years, PPH was noted in 4 (18.18%) patients. Statistically insignificant ( $P = 0.7634$ ) association between age and PPH was noted.

69 (57.5%) patients were multiparas and PPH was seen in 8 (11.59%) patients. Total 51 (42.5%) patients were not multiparas and PPH was observed in 10 (19.61%) patients. Association of multiparity with PPH was statistically insignificant with P value 0.512.

Total 47 (39.17%) patients with previous c-section, PPH was noted in 10 (21.28%) patients. Seventy three (60.83%) patients who have no history of previous C-section, PPH was noted in 8 (10.96%) patients. Insignificant ( $P = 0.199$ ) association between previous C-section and PPH was noted.

PPH was noted in 1 (9.09%) patients, 3 (15.79%) patients, 2 (22.22%) patients, 4 (50%) patients having previous history of 1, 2, 3 and 4 C-sections respectively and insignificant ( $P = 0.1537$ ) association of No. of previous C-section with PPH was observed.

PPH was not noted in any case of Grade I placenta previa but PPH was seen in 2 (5.71%), 7 (31.82%) and 9 (60%) cases of Grade II, III and IV placenta previa respectively. Highly significant ( $P = 0.0001$ ) association of grade of placenta previa with PPH was noted.

Insignificant association of Hysterectomy with age ( $P = 0.4516$ ), multiparity ( $P = 0.8415$ ), previous history of C-section ( $P = 1.00$ ) was noted. But statistically significant association of PPH with grades of placenta previa and No. of previous C-section was noted with p value 0.0012 and 0.0171. (Table 2)

Table 1: Association of PPH with different variables

Stratification with respect to age of PPH				
Age Group	PPH		Total	P. Value
	Yes (%)	No (%)		
20-25	5 (11.90)	37 (88.09)	42 (35)	0.7634
26-30	9 (16.07)	47 (83.93)	56 (46.67)	
Above 30	4 (18.18)	18 (81.82)	22 (18.33)	
<b>Total</b>	<b>18 (15)</b>	<b>102 (85)</b>	120	
Multiparity	PPH		Total	P. Value
	Yes (%)	No (%)		
Yes	8 (11.59)	61 (88.41)	69 (57.5)	0.512
No	10 (19.61)	41 (80.39)	51 (42.5)	
<b>Total</b>	<b>18 (15)</b>	<b>102 (85)</b>	120	
Previous section	PPH		Total	P. Value
	Yes (%)	No (%)		
Yes	10 (21.28)	37 (78.72)	47 (39.17)	0.199
No	8 (10.96)	65 (89.04)	73 (60.83)	
<b>Total</b>	<b>18 (15)</b>	<b>102 (85)</b>	120	
NO OF PREVIOUS C-SECTION	PPH		Total	P. Value
	Yes (%)	No (%)		
1	1 (9.09)	10 (90.91)	<b>11 (23.40)</b>	0.1537
2	3 (15.79)	16 (84.21)	<b>19 (40.43)</b>	
3	2 (22.22)	7 (77.78)	<b>9 (19.15)</b>	
4	4 (50)	4 (50)	<b>8 (17.02)</b>	
<b>Total</b>	10 (21.28)	37 (78.72)	<b>47</b>	
Grade of placenta previa	PPH		Total	P. Value
	Yes (%)	No (%)		
I	0	48 (100)	48 (40)	0.0001
II	2 (5.71)	33 (94.29)	35 (29.17)	
III	7 (31.82)	15 (68.18)	22 (18.33)	
IV	9 (60)	6 (40)	15 (12.5)	
<b>Total</b>	<b>18 (15)</b>	<b>102 (85)</b>	120	

Table 2: Association of hysterectomy with different variables.

Stratification with respect to age of Hysterectomy				
Age Group	Hysterectomy		Total	P. Value
	Yes (%)	No (%)		
20-25	1 (2.38)	41 (97.62)	42 (35)	0.4516
26-30	3 (5.36)	53 (94.64)	56 (46.67)	
Above 30	0	22 (100)	22 (18.33)	
<b>Total</b>	<b>4 (3.33)</b>	<b>116 (96.67)</b>	<b>120</b>	
Multiparity	Hysterectomy		Total	P. Value
	Yes (%)	No (%)		
Yes	2 (2.90)	67 (97.10)	69 (57.5)	0.8415
No	2 (3.92)	49 (96.08)	51 (42.5)	
<b>Total</b>	<b>4 (3.33)</b>	<b>116 (96.67)</b>	<b>120</b>	
Previous section	Hysterectomy		Total	P. Value
	Yes (%)	No (%)		
Yes	2 (4.26)	45 (95.74)	47 (39.17)	1.00
No	2 (2.74)	71 (97.26)	73 (60.83)	
<b>Total</b>	<b>4 (3.33)</b>	<b>116 (96.67)</b>	<b>120</b>	
Grade of placenta previa	Hysterectomy		Total	P. Value
	Yes (%)	No (%)		
I	0	48 (100)	48 (40)	0.0012
II	0	35 (100)	35 (29.17)	
III	1 (4.55)	21 (95.45)	22 (18.33)	
IV	3 (20)	12 (80)	15 (12.5)	
<b>Total</b>	<b>4 (3.33)</b>	<b>116 (96.67)</b>	<b>120</b>	
NO OF PREVIOUS C-SECTION	HYSTERECTOMY		Total	P. Value
	Yes (%)	No (%)		
1	0	11 (100)	11 (23.40)	0.0171
2	0	19 (100)	19 (40.43)	
3	0	9 (100)	9 (19.15)	
4	2 (25)	6 (75)	8 (17.02)	
<b>Total</b>	<b>2 (4.26)</b>	<b>45 (98.74)</b>	<b>47</b>	

### DISCUSSION:

Our study aimed to determine the contributing factors and outcome of placenta previa in pregnant ladies between 37-42 weeks of pregnancy. In which the incidence of placenta previa in women with history of previous caesarean section and multiparity was 39.16% and 57.5% respectively. Postpartum hemorrhage occurred in 15% and hysterectomy was done in 3.33% of women.

Naheed et al In their study Risk factors associated with major placenta previa found that the prevalence of placenta previa was 0.7%. They found that the risk factors and their percentage associated with placenta previa as follows multi-parity 62.01%, previous caesarean section 41.37%, previous abortion 34.4% multiple pregnancy 3.4%. As for as relation of placenta previa with age 43% of women were above 35 years of age<sup>1</sup>.

In a retrospective Cohort study at Fatima Memorial Hospital Lahore, Majority of patients were between 26-30 years of age. In this study previous caesarean section accounts for 64.2% & previous vaginal delivery accounts for 35.7% previous History of placenta previa was found to be a risk factor for future placenta previa in up to 55.35% of patient<sup>3</sup>. In a cross sectional observational study, Farhana Kalam and others found that previous caesarean section is a risk factors for future development of placenta previa in 22% of patient the postpartum hemorrhage occurred in 38% of patients<sup>5</sup>. Gayatri et al, in a prospective study found that the overall incidence of placenta previa is 0.6%, in scarred uterus 1.2% and in unscarred uterus 0.97%.<sup>9</sup> The incidence increased with increasing number of parity, Age & previous scar. Postpartum hemorrhage rate in scarred & un-scarred uterus is

47.05% & 71.6 respectively. In this study caesarean hysterectomy was done in 8.8% of patients with scarred uterus. But in un-scarred uterus not a single hysterectomy done.

In another study, Goel A, found that risk of placenta previa increases with increasing number of placenta previa. The incidence of placenta previa in patients with history of previous one, two & three previous section was 1.41%, 5.08% & 50% respectively.<sup>7</sup> Shakira Parveen in her study evaluated maternal and neonatal adverse outcome at repeat vaginal delivery. It was found woman with previous caesarean section were at high risk of placenta praevia: odds ratio 2.5 (95% CI = 0.68-9.6).<sup>10</sup> Hung et al found that the prevalence of placenta previa is (1.2%) among the 37,702 pregnancies analyzed in an Asian population.<sup>11</sup>

Sato et al in a study Anesthesia for caesarian section found that the incidence of placenta previa was 12.5%.<sup>12</sup> Ananth et al, performed a meta-analysis on association of placenta previa with history of cesarean delivery and abortion. The study included a total of 3.7 million pregnant women, of whom 13,992 patients were diagnosed with placenta previa. The reported incidence of placenta previa ranged between 0.28% and 2.0% or approximately 1 in 200 deliveries.<sup>13</sup>

The women with previous history of cesarean delivery were 2.6 times at greater risk for development of placenta previa in a subsequent pregnancy. The results varied by study design. With case-control studies showing a stronger relative risk (relative risk 3.8, 95% confidence interval 2.3 to 6.4) than cohort studies did (relative risk 2.4, 95% confidence interval 2.1 to 2.8).

Deborah Lyon et al, have reported the incidence of placenta previa was 0.3-0.5% of all pregnancies. The risk increased 1.5 to 5 fold with a history of previous caesarean delivery. At age 20-29 years the incidence was 0.33%.<sup>14</sup> In a study, Alchalabi HA found that the placenta previa due to previous caesarean section increased the risk of hysterectomy up to 14folds as compared to placenta previa not due to previous caesarean section.<sup>15</sup> Kennare et al, in a population based retrospective study found that the cesarean section increased the risks of placenta previa (OR 1.66, 95% CI 1.630-2.11).<sup>16</sup>

Mona Lydon-Rochelle et al, in a retrospective to assess the association between first-birth cesarean delivery and second – birth placental abruption and previa. The placenta previa was found 5.2 per 1000 singleton deliveries at second births. There was increased risk of placenta previa (OR 1.4, 95% CI 1.1, 1.6) at second births in women with previous history caesarean section as compared with women

with previous history of vaginal deliveries.<sup>17</sup> In a study Ww K and Leung WC found that the incidence of placenta previa in women with history of previous cesarean section was 1.31% as compared with women with unscarred uterus 0.75%.<sup>18</sup> Qublan HS in a retrospective study analysis of 2276 caesarean section found that increasing number of previous caesarean delivery was associated with increase placenta previa.<sup>19</sup>

Naqvi K Z and Thontia S, in a retrospective study found that one woman out of 1493 deliveries under gone peripartum hysterectomy. The frequency of peripartum hysterectomy was 6/1000.<sup>21</sup> In the study conducted by Odibo AO et al, found that the frequency of placenta previa was (15 per 1000 births) in women with previous caesarean section.<sup>21</sup>

### CONCLUSION:

This study concludes that risk of future development of placenta previa increases with increasing number of previous caesarean section and multi-parity. Placenta previa also affects the maternal outcomes of pregnancy. It increases the risk of post- partum hemorrhage & subsequent hysterectomy. So, the efforts must be made to reduce the rate of caesarean section, avoid smoking & educate the people about importance of antenatal examination and for family planning to reduce the risk of placenta previa and its complications.

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