

A Study to Access the Association between Prior Caesarean Delivery and Subsequent Development of Placenta Previa and Adherent PlacentaRanu Singh Kushwaha¹, Khushboo Yasmin², Dipti Roy³¹Senior Resident, Department of Obstetrics and Gynaecology, Nalanda Medical College and Hospital, Bihar, India²Senior Resident, Department of Obstetrics and Gynaecology, Nalanda Medical College and Hospital, Bihar, India³Professor, Department of Obstetrics and Gynaecology, Nalanda medical College and Hospital, Bihar, India

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Conflict of interest: Nil

Abstract**Aim:** The aim of the present study was to find the association between prior caesarean delivery and subsequent development of placenta previa and adherent placenta.**Methods:** A descriptive study was conducted on 500 antenatal women with post cesarean pregnancy at department of Obstetrics and Gynaecology for a period of 1 year**Results:** Placenta previa was found in 3% that is 15 of the study group compare to 2%, that is 10 of the comparison group. It was statistically significant with 2 times risk. According to type of placenta previa type 4 or central previa was the most common type. Altogether anterior previa occurred at a frequency of 44% compared to posterior previa which was 27%. Central previa occurred in 29.4%. Total major previa were 56% and minor previa was 44% in the study group. Placental adherence was found only in previous caesarean group which constituted 0.4% of previous CS group. Majority comes in the para 1 group. In those with placenta previa, multipara (\geq para 2) was more (33.3%) compared to those without previa (14.44%) and is statistically significant. Previous history of placenta previa was present in 13.33% of patients with previa where as it was not present in those without previa. In both groups majority did not have a history of abortion. Multiple sections were more in previa group (26.67%) compared to 8.66% in those without previa which was statistically significant with a p value of 0.004. History of wound infection is more (26.67%) in those with placenta previa compared to 6.18% in those without previa which was statistically significant. Inter pregnancy interval of less than 2 years were more (33.33%) in those with placenta previa compared 15.46% of those without previa and is statistically significant.**Conclusion:** We concluded that pregnant women with previous caesarean delivery must be regarded as high risk for placenta previa and must be monitored carefully.**Keywords:** Placenta previa, Previous caesarean section, Risk factors

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Introduction

The rate of caesarean section (CS) is increasing in most countries. However, the long-term maternal morbidity and the obstetric future of women who have had previous caesarean birth needs further evaluation. Bender [1] first suggested that a uterine scar could predispose the mother to the development of placenta praevia in subsequent pregnancies. Recent studies by Clark et al [2] and Rose and Chapman [3] have confirmed the significant relationship between placenta praevia and previous CS. Placenta praevia is strongly associated with placenta accreta. [4] The incidence of placenta accrete is as high as 67% in patients with placenta praevia and multiple previous CS. [2] This

association of previous CS, placenta praevia and placenta accrete is becoming increasingly acknowledged and is causing concern since it carries a significant risk of caesarean hysterectomy with its incumbent morbidity and mortality.

Worldwide, the rate of primary and overall caesarean sections (CS) has been steadily and significantly rising. This increase has been attributed to multiple factors including increased maternal requests and obstetricians' preference. [5,6] This rise is despite its associated morbidities and the increased incidence of PP in future pregnancies. [7-9] Placenta previa is associated with the increased risk of maternal and perinatal morbidity and mortality. [10,11] This risk

is more pronounced in the case of morbidly adherent placenta previa (MAPP) accreta, increta, and percreta. While the maternal risk related to morbidly adherent placenta previa is well established [10-13], few studies have explored the outcome of non-adherent placenta previa in patients with previous one or more lower uterine segment cesarean section (LUSCS).

Freidricksen and co-workers (1999) reported a 25% hysterectomy rate in women undergoing repeat caesarean for a previa compared with only 6% in those undergoing primary caesarean for placenta previa. [14] Earlier studies have also shown that lower anterior uterine segment implantations occur with sufficient frequency in patients who had undergone caesarean previously, to warrant ultrasonic placentography prior to surgical re-entry of lower uterine segment. [15,16]

The aim of the present study was to find the association between prior caesarean delivery and subsequent development of placenta previa and adherent placenta.

Materials and methods

Table 1: Prevalence of placenta previa in previous CS and previous normal delivery

Placenta previa	Previous CS		Previous normal delivery	
	No.	Percentage	No.	Percentage
Yes	15	3	10	2
No	485	97	490	98
p value=0.07				

Placenta previa was found in 3% that is 15 of the study group compare to 2%, that is 10 of the comparison group. It was statistically significant with 2 times risk.

Table 2: Distribution of types of placenta previa in cases of prior caesarean delivery

	Type of previa	No.	% of previa
Minor	Type 1 anterior	2	13%
	Type 2 anterior	3	18%
	Type 2 posterior	2	13%
Major	Type 3 anterior	2	12%
	Type 3 posterior	3	17%
	Type 4 central	5	27%

According to type of placenta previa type 4 or central previa was the most common type. Altogether anterior previa occurred at a frequency of 44% compared to posterior previa which was 27%. Central previa occurred in 29.4%. Total major previa were 56% and minor previa was 44% in the study group.

Table 3: Distribution of adherent placenta in previous CS versus previous normal delivery and Distribution according to parity

Adherent placenta	Previous CS		Previous normal delivery	
	No.	Percentage	No.	Percentage
Yes	2	0.4%	0	0%
No	498	99.6%	500	100%
p value = 0.17				
Parity	Previa		Non-previa	
	No.	Percentage	No.	Percentage
PARA 1	10	66.7%	415	85.56%
≥PARA 2	5	33.3%	70	14.44%
p value=0.005				

A descriptive study was conducted on 500 antenatal women with post cesarean pregnancy at department of Obstetrics and Gynaecology, Nalanda Medical College and Hospital, Bihar, India for a period of 1 year.

Inclusion Criteria

- Singleton pregnancies with gestational age >32 weeks.

Exclusion Criteria

- Multigravidas without prior caesarean delivery
- Multiple pregnancies

Statistical Analysis

Data collected were entered in to master sheets and analysed using computer software, SPSS version 16. Data are expressed in its frequency and percentage. To elucidate the associations and comparisons between different parameters chi square test and fishers exact test were used as non-parametric test. For all statistical evaluations, a probability value of <0.05 was considered significant.

Results

Placental adherence was found only in previous caesarean group which constituted 0.4% of previous CS group. Majority comes in the para 1 group. In those with placenta previa, multipara (\geq para 2) was more (33.3%) compared to those without previa (14.44%) and is statistically significant.

Table 4: History of placenta previa in previous pregnancy and Distribution according to abortions

Previous placenta-previa	Previa		Non-previa	
	No.	Percentage	No.	Percentage
Present	2	13.33%	0	0%
Absent	13	86.67%	485	100%
Fisher exact p value=0.000.				
Abortions	Previa		Non-previa	
	No.	Percentage	No.	Percentage
Yes	5	33.3%	85	17.52%
No	10	66.7%	400	82.48%
p value=0.048				

Previous history of placenta previa was present in 13.33% of patients with previa where as it was not present in those without previa. In both groups majority did not have a history of abortion.

Table 5: Distribution according to number of prior caesarean delivery, according to history of wound infection following previous caesarean delivery and according to inter pregnancy interval (IPI)

No. of prior CS	Previa		Non-previa	
	No.	Percentage	No.	Percentage
2	4	26.67%	42	8.66%
1	11	73.33%	443	91.34%
p value=0.004				
H/O Wound infection	Previa		Non-previa	
	No.	Percentage	No.	Percentage
Yes	4	26.67%	30	6.18%
No	11	73.33%	455	93.82%
p value=0.0007				
Inter pregnancy interval	Previa		Non-previa	
	No.	Percentage	No.	Percentage
<24 months	5	33.3%	75	15.46%
>24 months	10	66.7%	410	84.54%
p value=0.016				

Multiple sections were more in previa group (26.67%) compared to 8.66% in those without previa which was statistically significant with a p value of 0.004. History of wound infection is more (26.67%) in those with placenta previa compared to 6.18% in those without previa which was statistically significant. Inter pregnancy interval of less than 2 years were more (33.33%) in those with placenta previa compared 15.46% of those without previa and is statistically significant.

Discussion

During the past few decades the world wide incidence of caesarean births has increased markedly. World wide variation exists in rates for caesarean delivery; currently range from 10-40% of all deliveries, whereas WHO has suggested that there is no increase in health benefits associated with caesarean rates more than 10-15%. [17] About 1/3rd of the caesarean sections are repeat procedures.

Repeat caesarean sections are associated with increased morbidity, but little has been done to investigate the complications that are specifically associated with repeat caesarean sections. Perhaps the greatest risk to future pregnancies is an increase in disorders caused by abnormal placentation including placenta previa, placenta accreta. [17]

Placenta previa was found in 3% that is 15 of the study group compare to 2%, that is 10 of the comparison group. It was statistically significant with 2 times risk. Study conducted by Nzeh et al, showed similar frequencies with posterior upper segment of 36.2% followed by anterior upper segment and fundal implantations, each had a frequency of 19.1%. [16] Placenta previa was 5.3% in those with previous caesarean section. In a similar study by Filipov E et al, placenta previa was found in 3.9% in patients with previous caesarean sections compared to 0.45% in those without previous caesarean section. [18] According to type of

placenta previa type 4 or central previa was the most common type. Altogether anterior previa occurred at a frequency of 44% compared to posterior previa which was 27%. Central previa occurred in 29.4%. Total major previa were 56% and minor previa was 44% in the study group. Placental adherence was found only in previous caesarean group which constituted 0.4% of previous CS group. Majority comes in the para 1 group. In those with placenta previa, multipara (\geq para 2) was more (33.3%) compared to those without previa (14.44%) and is statistically significant. Previous history of placenta previa was present in 13.33% of patients with previa where as it was not present in those without previa.

In both groups majority did not have a history of abortion. Multiple sections were more in previa group (26.67%) compared to 8.66% in those without previa which was statistically significant with a p value of 0.004. This is similar to that proposed by Clark et al, that single caesarean delivery increases the risk by 0.65%, 2 increases the risk by 1.5%, 3 or more by 2.2%. Similar results have been found by Ananth et al [19], whose meta-analysis showed a dose-response pattern for the risk of previa on the basis of number of prior caesarean deliveries. History of wound infection is more (26.67%) in those with placenta previa compared to 6.18% in those without previa which was statistically significant. Inter pregnancy interval of less than 2 years were more (33.33%) in those with placenta previa compared 15.46% of those without previa and is statistically significant. Similar results have been found by Getahun et al [20], that in women with first caesarean delivery, there is increased risk of placenta previa in pregnancy conceived within 2 years.

Conclusion

In those with previous caesarean section, maternal age more than 30 years, higher parity, previous history of abortion, multiple caesarean sections are the risk factors which contribute to the occurrence of placenta previa, other risk factors observed in this study are history of postoperative wound infection in previous pregnancy and short interpregnancy interval of less than 2 years Thus we concluded that pregnant women with previous caesarean delivery must be regarded as high risk for placenta previa and must be monitored carefully.

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