

RISK FACTORS OF PLACENTA PREVIA AMONG RURAL INDIAN WOMENSantu Maiti¹, Priyankar Kanrar², Chaitali Karmakar³, Samrat Chakrabarti⁴, Amit Mandal⁵**HOW TO CITE THIS ARTICLE:**

Santu Maiti, Priyankar Kanrar, Chaitali Karmakar, Samrat Chakrabarti, Amit Mandal. "Risk Factors of Placenta Previa among Rural Indian Women". Journal of Evolution of Medical and Dental Sciences 2014; Vol.3, Issue 65, November 27; Page: 14163-14168, DOI:10.14260/jemds/2014/3896

ABSTRACT: OBJECTIVE: The present study was to find out risk factors of placenta previa among rural Indian women. **METHODS:** This was a retrospective observational study conducted over two years. 220 women with placenta previa were taken as cases and 440 women without placenta previa were taken as control. **RESULTS:** Advanced maternal age (OR 2.7; 95% CI: 1.84-3.97), increased parity (OR 1.58; 95% CI: 1.13-2.22), previous abortions (OR 2.25; 95% CI: 1.5-3.35), previous uterine surgery (OR 5.91; 95% CI: 3.56-9.87), uterine anomalies (OR 4.64; 95% CI: 1.41-15.27) and tobacco chewing (OR 3.58; 95% CI: 1.04-12.37) are the potential risk factors. No significant associations have been found with socio economic status, religion, previous history of placenta previa, infertility treatment and sex of the newborn. **CONCLUSION:** Placenta previa have some identifiable risk factors. Tobacco chewing is a novel potential risk factor.

KEYWORDS Placenta previa-Risk factors-India-Tobacco.

INTRODUCTION: Placenta previa is defined as a condition where placenta is inserted completely or partially in the lower uterine segment.⁽¹⁾ Lesser differential growth in lower segment caused by abnormal vascularization of endometrium due to scarring or atrophy from pervious trauma has been hypothesized as etiology,⁽²⁾ but exact cause is still not known. It is an important cause of antepartum bleeding, mostly in the second or third trimester. It results in significant maternal and perinatal morbidity.⁽³⁾⁽⁴⁾ The incidence varies worldwide higher rate have been found among Asian ethnicity.⁽⁵⁾

A number of risk factors have been consistently found including advanced maternal age, multiparity, previous abortions especially habitual and induced abortions, previous cesarean section and uterine anomalies by others.⁽⁶⁾⁻⁽¹⁰⁾

Additionally increased associations of smoking and cocaine use during pregnancy, male fetuses and Jewish ethnicity have mention also mentioned by some previous researchers.^{(6),(11)-(13)} The strength of association of these potential risk factors have varied through the studies and possibility of confounding factors have not been ruled out properly in all previous studies. Moreover there is paucity of data from Indian studies. Keeping all these in background this study was conducted to investigate potential risk factors of placenta previa among rural Indian women.

MATERIALS AND METHODS: This retrospective case control study was conducted over a time period of two years in a tertiary medical hospital in India that provides health care to a large number population mainly coming from rural area. Total two hundred and twenty women with singleton pregnancy along with placenta previa were included in the study group as cases after excluding incomplete records. Placenta previa was defined as placenta covering or reaching within 2 cm of internal os detected by last trans-abdominal ultrasonography before delivery (At least after 28 weeks gestation) or by clinical examination during caesarean delivery or after vaginal delivery. Four hundred and forty randomly sampled women with singleton pregnancy delivered vaginally or by

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caesarean delivery during the above period were included in the control group. For each case two controls were chosen. Data were collected regarding age, socio-economic status, religion, addiction, past histories (number of previous pregnancy, previous abortions and previous history of caesarean delivery or any other uterine operation, history of abortions, previous history of placenta previa and history of infertility treatment), presence of uterine malformation and sex of the baby. Statistical analysis was done by SPSS (Version 18). Data were collected as nominal variable. Test of independence were assessed by Pearson's chi-square test and level of significance was assigned as $P < 0.05$. Crude odd ratios (OR) with their 95% confidence intervals (CI) were used to determine strength of associations of various risk factors.

RESULTS: Among total 660 women included in this study, 220 women were taken as cases with placenta previa and rest were controls. The potential socio-demographic risk factors were investigated by comparing between two groups (Table 1). About one third (32.28%; 71/220) of the mothers with placenta previa were aged more than 30 years. Advanced maternal age (>30 years) was found to be significantly associated with placenta previa (OR 2.7; 95% CI: 1.84-3.97).

Though relatively more women (67.28%; 148/220) with placenta previa were from lower socio-economic status compared to control group (60.28%; 265/440) the difference between two groups was not statistically significant ($p > 0.05$). Most of the women in both groups were Hindu by religion. There was no statistical difference in two groups in terms of religion ($p > 0.05$). No mothers in any group were smoker or used cocaine, but seven (3.18%; 7/220) mothers in the study group had addiction of chewing tobacco compared to four (0.92%; 4/440) in the control group (OR 3.58; 85% CI: 1.04-12.37).

Parameters	Number of women (%)		P value	Crude odd ratio (95%CI)
	Cases (n=220)	Controls (n=440)		
Age				
<30 years	149 (67.72)	375 (85.23)	<0.001	2.7 (1.84-3.97)
≥30 years	71(32.28)	65(14.77)		
Socioeconomic status				
Lower	148 (67.28)	265 (60.28)	0.069	1.37 (0.97-1.93)
Middle	72(32.72)	175 (39.72)		
Religion				
Hindu	136 (61.81)	281 (63.86)	0.607	0.91 (0.65-1.28)
Muslim	84(38.19)	159 (36.14)		
Addiction of tobacco				
Yes	7 (3.18)	4 (0.92)	0.031	3.58 (1.04-12.37)
No	213 (96.82)	436 (99.08)		

Table 1: Potential socio-demographic risk factors of placenta previa

We further assessed obstetric risk factors of placenta previa (Table 2). About two third (66.36%; 146/220) of women among the study group were multiparous compared to 55.45% (244/440) women in the control group. There was significant association of increased parity with

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placenta previa (OR 1.58; 95% CI: 1.13-2.22). 27.27% (61/220) women with placenta previa had previous abortions in contrast with only 14.54% (64/440) in the control group (OR 2.25; 95% CI: 1.5-3.35). Previous history of uterine surgery was found to be strongly associated with women having placenta (OR 5.91; 95% CI: 3.56-9.87).

Three cases had previous hysterotomy and two cases had previous myomectomy in the placenta previa group. Rest (51 cases) had previous history of cesarean delivery. No history of hysterotomy or myomectomy was found in the control group. Nine mothers among cases had uterine anomalies (four bicornuate uteri, three arcuate uteri and two septate uteri) compared to four mothers (Two bicornuate uteri and two arcuate uteri) in the control group. No significant association have been found with previous history of placenta previa ($P>0.05$) or previous history of infertility treatment ($P>0.05$). Uterine anomalies were also found to be more likely among cases (OR 4.64; 95% CI: 1.41-15.27). 116 (52.72%; 116/220) mothers with placenta previa had male baby compared to 243 (55.22; 243/440) mothers in the control group. There was no significant difference in the two groups in terms of sex of the newborn ($P>0.05$).

Parameters	Number of women (%)		P value	Crude odd ratio (95%CI)
	Cases (n=220)	Controls (n=440)		
Multiparity				
Yes	146 (66.36)	244 (55.45)	<0.01	1.58 (1.13-2.22)
No	74(33.64)	196 (45.55)		
Abortion				
Yes	61(27.72)	64 (29.09)	<0.001	2.25 (1.51-3.35)
No	159(72.28)	376 (70.91)		
Uterine surgery				
Yes	56(25.45)	24 (5.45)	<0.001	5.91 (3.56-9.87)
No	164(74.55)	416(94.55)		
Previous placenta previa				
Yes	1 (0.45)	3 (0.68)	0.724	0.66 (0.07-6.43)
No	219 (99.55)	437 (99.32)		
Infertility Treatment				
Yes	2 (0.9)	2 (0.45)	0.478	2.01 (0.28-14.36)
No	218 (99.1)	438(99.55)		
Uterine Anomaly				
Yes	9 (4.09)	4 (0.9)	<0.01	4.64 (1.41-15.27)
No	211(95.91)	436 (91.9)		
Newborn Sex				
Male	116 (52.72)	243 (55.23)	0.608	0.91 (0.65-1.25)
Female	104 (47.28)	197 (44.77)		

Table2: Potential obstetric risk factors of placenta previa

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DISCUSSION: In present study we investigated regarding the risk factors of placenta previa. Among socio demographic factors advanced maternal age of >30 years was found to be clearly associated with placenta previa. Similar results were found by Tuzović et al.⁽⁸⁾ Sclerotic changes in the intramyometrial arteries with increasing age may contribute to placenta previa by reducing blood supply in the placenta. Moreover Hasegawa et al.⁽¹⁴⁾ have mentioned that advanced maternal age is an independent risk factor of massive hemorrhage during cesarean section in women with placenta previa.

No significant associations of placenta previa with socio-economic status or religion have been found in this study. Usta et al.⁽¹⁵⁾ have demonstrated parallel results. Multiparity has been mentioned as a risk factor by previous studies.^{(8),(16)} We have also found one and half fold increased risk with multiparity. In addition our study has also demonstrated that previous history of abortions was associated with placenta previa. Johnson et al.⁽¹⁷⁾ and Hendricks et al.⁽¹⁸⁾ we also found similar results. Positive associations of previous cesarean section with placenta previa have well mentioned in previous studies.⁽¹⁸⁾⁻⁽²¹⁾

Though it has no positive association with massive hemorrhage during next cesarean but have increased risk of placental adherence. ⁽¹⁴⁾ In our study along with previous cesarean we have also included previous history of other uterine surgeries like hysterotomy and myomectomy as potential risk factor and we have been found to have more than fivefold increased risk of placenta previa with this risk factor. No other study previously have investigated scarred uterus with hysterotomy or myomectomy as risk factor. Interestingly Hossain et al.⁽²²⁾ have not found any increased prevalence of placenta previa among women with prior cesarean delivery.

Independent association of infertility treatment has been mentioned by two studies,⁽⁶⁾⁽²³⁾ but we found opposite results. Previous history of placenta previa also was not found to be a risk factor in our study. In addition there was no significant association of sex of newborn with placenta previa in our study. Tuzović et al.⁽⁸⁾ also have parallel result. Interestingly when others⁽¹³⁾⁽²⁴⁾ have demonstrated positive association of smoking or cocaine use as risk factor, we have found positive association of tobacco chewing with placenta previa.

Our study have confirmed some of the potential risk factors mentioned in earlier studies like advanced maternal age, multiparity, previous abortion, cesarean section and uterine anomalies.

Chewing tobacco has been found as a new potential risk factor. Proper identification and management of women with potential risk factors may decrease maternal and perinatal morbidity and mortality. Our study being a hospital based case control retrospective study has some limitations. Further population based studies from India are needed to get clearer picture of this potential life threatening clinical condition.

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Date of Submission: 12/11/2014.
Date of Peer Review: 13/11/2014.
Date of Acceptance: 21/11/2014.
Date of Publishing: 25/11/2014.