

## RISK FACTORS ASSOCIATED WITH PLACENTA PREVIA

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### ABSTRACT

**Background:** Placenta previa is the cause of one-third of cases of vaginal bleeding in the second and third trimesters with relative risk of some morbidities in women and neonates. **Objective:** Our purpose was to define the clinical risk factors associated with placenta previa. **Materials and Methods:** This is Prospective Case-Control study conducted in the Department of Obstetrics and Gynaecology in Tishreen University Hospital – Lattakia- Syria from January 2019 to January 2020. All pregnant women with gestational age >28 weeks were included in the study. **Results:** A total of 95 cases of placenta previa were included in the study and compared with 95 healthy pregnant women. Mean maternal age was 32.5 ±3.9 years in the group of cases versus 29.2 ±4.1 in control group, p:0.001. Major risk factors for occurrence of placenta previa were: advanced maternal age (OR:1.7 [0.8-3.6], p:0.03), multiparous (OR:3 [0.7-6.1], p:0.001), previous abortions with curettage (OR: 3.2 [1.2- 6.5], p:0.01), previous cesarean section (OR:5 [2.1-11.6], p:0.002), and pathologic presentation (OR:3.5 [1.3-7.9], p:0.003). **Conclusion:** Identifying the risk factors associated with placenta previa is essential to reduce the potential serious complications and guiding management.

**KEYWORDS:** Placenta previa, risk factors, morbidities, advanced maternal age.

### INTRODUCTION

Placenta previa is a severe obstetric complication of pregnancy that occurs when the placenta attaches to the lower uterine segment and partially or completely covers the internal cervix.<sup>[1,2]</sup> The prevalence of placenta previa is approximately 4 per 1000 births but varies worldwide and has increased in parallel with changing trends in risk factors.<sup>[3]</sup> Risk factors are many and include prior cesarean delivery, with the risk of previa increasing with increasing number of prior cesareans.<sup>[4]</sup> Advanced maternal age, multiparity, multiple gestation, cigarette smoking, prior placenta previa and otherwise unexplained elevated alpha fetoprotein have also been identified as risk factors.<sup>[5]</sup> Placenta previa is associated with high maternal and neonatal adverse outcomes including severe bleeding and preterm birth, as well as the need for cesarean delivery. Severe bleeding in placenta previa is associated with severe maternal morbidity and sometimes mortality.<sup>[6]</sup> Identification of the risk factors might be utilized in influencing clinical practice. The aim of the current study was to evaluate possible risk factors for placenta previa.

### MATERIALS AND METHODS

#### Study design and data collection

We studied all pregnant women with gestational age >28 weeks established by transabdominal ultrasonographic imaging or of the last menstrual period who admitted to the Department of Obstetrics and Gynaecology from January 2019 to January 2020 in Tishreen University Hospital –Lattakia-Syria. Subjects were classified into two groups: Group of cases included pregnant with the diagnosis of placenta previa, and control group included healthy pregnant women. The demographic information included age and co-morbidities were recorded. Data on potential risk factors for development placenta previa were extracted from medical records and compared with a control group. Exclusion criteria were adherent placenta, placenta abruption and incomplete data.

#### Definitions

**Advanced maternal age (AMA):** defined as childbearing in a woman over 35 years of age, is associated with several adverse maternal and fetal outcomes.<sup>[7]</sup>

**Statistical Analysis**

Statistical analysis was performed by using IBM SPSS version 20. Basic Descriptive statistics included means, standard deviations (SD) Frequency and percentages.

Differences of distribution examined by using chi-square test or Fisher exact test if it need. Risk factors were evaluated in univariate analysis, and in multivariate analysis by a multiple logistic stepwise regression procedure. Variables with p less than 0.05 were included in the model. Odd ratios were estimated from b coefficients obtained, with respective 95% confidence intervals (CI 95%). Statistical significance was accepted at a P value of <0.05.

**RESULTS**

A total of 190 pregnant women who were admitted to the Department of Obstetrics and Gynecology from January 2019 to January 2020, 95 were cases of placenta previa.

The mean age was 31.4±4.4(range,22-42years), baseline characteristics of the patients are as given in table(1).

As shown below, the mean age of the placenta previa group was determined as 32.5 ±3.9 years versus 29.2 ±4.1 years in control group, p:0.001. There were high frequency of women older than 30 years in placenta previa group than in control group (82% vs. 62%, p:0.03). The following variables were more frequently in placenta previa group : multiparous (67.4% vs. 40%, p:0.001), presence of previous abortions with curettage(29.5% vs. 11.6%,p:0.01), previous cesarean section(31.6% vs. 8.4%,p:0.002), Breech presentation (18.9% vs. 8.4%) and transverse presentation(12.6% vs. 3.2%), p:0.003. There were no significant differences between two groups regard to hypertension, diabetes mellitus, smoking, previous placenta previa, uterine abnormalities, and newborn's sex(p>0.05).

**Table 1: Demographic characteristics of the study population by comparison of the two group.**

Variables	Placenta previa N=(95)	Controls N=(95)	P-value
<b>Age (years)</b>	32.5 ±3.9	29.2 ±4.1	0.001
<b>Maternal age group(years)</b>			
<25	3(3.2%)	8(8.4%)	0.03
25-30	14(14.7%)	28(29.5%)	
30-35	56(58.9%)	45(47.4%)	
35-40	17(17.9%)	12(12.6%)	
≥40	5(5.3%)	2(2.1%)	
<b>Co-morbidities</b>	8(8.4%)	7(7.4%)	0.06
• <b>Hypertension</b>	65(68.4%)	78(82.1%)	
Present Absent Unknown	22(23.2%)	10(10.5%)	
• <b>Diabetes mellitus</b>			0.3
Present	12(12.6%)	6(6.3%)	
Absent	69(72.6%)	74(77.9%)	
Unknown	14(14.7%)	15(15.8%)	
<b>Smoking Present</b>	17(17.9%)	16(16.8%)	0.4
Absent	56(58.9%)	63(66.3%)	
Unknown	22(23.2%)	16(16.8%)	
<b>Obstetric history</b>			0.001
• Nulliparous	10(10.5%)	16(16.8%)	
• <b>Parous</b>			
1-4	21(22.1%)	41(43.2%)	
Multiparous	64(67.4%)	38(40%)	
<b>Previous abortions Absent</b>	59(62.1%)	74(77.9%)	0.01
<b>Present</b>			
• With curettage	28(29.5%)	11(11.6%)	
• Without curettage	8(8.4%)	10(10.5%)	
<b>Previous placenta previa</b>	4(4.2%)	3(3.2%)	0.7
Present Absent	91(95.8%)	92(96.8%)	
<b>Uterine abnormalities</b>	5(5.3%)	1(1.1%)	0.1
Present Absent	90(94.7%)	94(98.9%)	
<b>Previous cesarean section</b>	30(31.6%)	8(8.4%)	0.002
Present Absent	65(68.4%)	87(91.6%)	
<b>Newborn's sex</b>	58(61.1%)	49(51.6%)	0.1
Male Female	37(38.9%)	46(48.4%)	
<b>Type of pregnancy</b>	93(97.9%)	94(98.9%)	0.5
Singleton Multiple	2(2.1%)	1(1.1%)	

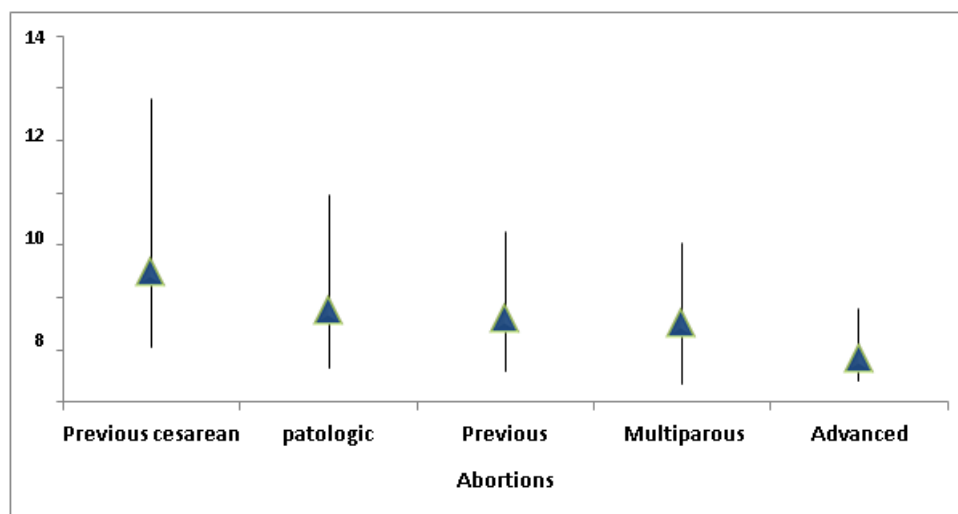
Type of presentation			
Cephalic	65(68.4%)	84(88.4%)	
Breech	18(18.9%)	8(8.4%)	0.003
transverse	12(12.6%)	3(3.2%)	

Significant independent risk factors for developing placenta previa were: advancedmaternal age, multiparous, previous abortions with curettage, previous cesarean section, and pathologic presentation, Table(2).

**Table 2: Risk factors for developing Placenta previa in the study population bymultivariate logistic regression.**

Factor	OR(95% CI)	p-value
Advanced maternal age	1.7[0.8-3.6]	0.03
Multiparous	3[0.7-6.1]	0.001
Previous abortions with curettage	3.2[1.2-6.5]	0.01
Previous cesarean section	5[2.1-11.6]	0.002
Pathologic presentation	3.5[1.3-7.9]	0.003

The risk factors are represented in the figure (1)



**Figure (1): Risk factors for developing placenta previa in the study population.**

**DISCUSSION**

This study demonstrated the predictive risk factors for placenta previa. Advanced maternal age was a risk factor for placenta previa, and women older than 35 years had 2-fold higher risk for placenta previa development. It has been suggested that atherosclerotic changes occurring in the uterine blood vessels at older ages, impaired blood supply and placental hypertrophy secondary to impaired vascularization are the mechanisms responsible for impaired normal development of placenta.<sup>[8]</sup> Similar to our findings, Tuzovic *et al* (2003).<sup>[9]</sup> and David *et al*(1993).<sup>[10]</sup> demonstrated that advanced maternal age increased likelihood of placenta previa 2.5, 3 fold respectively.

Previous history of cesarean section was found to be associated significantly with increased the risk of placenta previa 5- fold. It has been suggested that previous cesarean section scar is known to cause pathological changes in endometrial tissue.<sup>[11]</sup> In comparison to other studies, Tuzovic *et al* (2003).<sup>[9]</sup> found that women with a previous history of cesarean section had 2-fold higher risk for placenta previa. Gilliam *et al* (2002).<sup>[12]</sup> demonstrated a significant association of

cesarean section with placenta previa in which the risk increased 8.7-fold.

The history of multiparous increased the risk of placenta 3- fold. It might be explained by atrophic endometrium changes after frequent births and short intervals between births.<sup>[11]</sup> Tuzovic *et al* (2003).<sup>[9]</sup> found that gravidity of 3 and more increased the risk of placenta placenta 4-fold. Abu heija *et al* (1999).<sup>[13]</sup> also found that risk of placenta previa increased significantly after gravidity of 5 and more.

Previous abortions with curettage increased the risk of placenta previa 3.2-fold. Uterine curettage forms a basis for the development of placenta previa by damaging the uterine cavity. Similar to our findings, Tuzovic *et al* (2003).<sup>[9]</sup> and Zhang *et al*(1993).<sup>[14]</sup> demonstrated that previous abortions increased likelihood of placenta previa 2.8 , 3.7 fold respectively.

Pathologic presentation was increased the risk 3.5 fold. Tuzovic *et al* (2003).<sup>[9]</sup> demonstrated that pathologic presentation increased likelihood of placenta previa 6-fold.

Contrary to some previous studies, There were no significant difference between two groups regard to hypertension, diabetes mellitus, smoking, previous placenta previa, uterine abnormalities, and newborn's sex ( $p>0.05$ ) in the current study.

Hung *et al* (2007).<sup>[15]</sup> found that smoking increased the risk of placenta previa 3.3- fold. It can be explained by the vasoactive properties of nicotine and chronic hypoxia associated with carbon monoxide.

Demissie *et al*(1999)<sup>[16]</sup> demonstrated predominance of male sex at birth in women with placenta previa, and the underlying causes have not been clarified.

Raisanen *et al*(2014)<sup>[17]</sup> demonstrated that presence of diabetes mellitus increased the risk of placenta previa ( $p<0.05$ ).

Tuzovic *et al* (2003)<sup>[9]</sup> showed that presence of various uterine abnormalities increased the risk of placenta previa 8-fold.

Latif *et al*(2015).<sup>[18]</sup> found that presence of previous placenta previa increased the risk of placenta previa 19-fold.

## CONCLUSION

Identification of risk factors associated with placenta previa may assist in recognizing patients that may predisposed to placenta previa to initiate preventive measures and improving prognosis.

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