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Selected Pregnancy Variables in Women with Placenta Previa*

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Abstract: The aim of this study was to investigate risk factors and perinatal outcomes of pregnancies complicated by placenta previa. Birth records of 93 cases with placenta previa and 940 randomly selected controls were reviewed retrospectively. Statistical analysis was performed using Pearson's Chi-Square method. Placenta previa complicated 0.73% (n = 93) of all deliveries included in the study (n = 12834). Multiparity was more common in patients with placenta previa (78.5%, $p<0.001$). Placenta previa occurred in male infants in 62 cases (76.6%). Fetuses with placenta previa had lower fetal weight ; particularly, fetal weight less than 2500 g was a significant (40.9.%, $p<0.0001$). We also found that previous abortion (OR = 0.7; 95% CI = 0.57-0.83), previous placenta previa (OR = 5.17; 95%, CI = 5.61-7.62) and previous cesarean section (OR = 11.5; 95% CI = 3.91-33.41) were risk factors for placenta previa. The newborns that were delivered after placenta previa graded lower Apgar scores less than 7 at 5 min (24.7%, $p<0.0001$). Multiparity, previous placenta previa, previous abortion and previous cesarean section are risk factors for placenta previa.

Key words: Placenta previa, pregnancy, women, risk factors

INTRODUCTION

Placenta previa is a rare form of impaired placentation where placenta lies low in the uterine cavity, covering completely or partially the internal cervical ostium and there by preventing normal vaginal delivery. It is one of the main causes of vaginal bleeding in the third trimester (Frederkisen *et al*., 1999) and a significant cause of maternal (Crane *et al*., 2000; Love and Wallace, 1996). The incidence of placenta previa in pregnant women is approximately 0.3-0.8%, depending upon the population investigated (Sheiner *et al*., 2001; Frederiksen *et al*., 1999). A trend of increasing placenta previa incidence was observed in the past decade mainly because of an increasing cesarean section rate and advancing maternal age at the time of first pregnancy (Iyasu *et al*., 1993). Although the clinical course of placenta previa is highly suggestive, the etiology of this condition still remains obscure. The strongest connection was found between previous history of cesarean section (Abu-Heija *et al*., 1999; Hendricks *et al*., 1999; Gilliam *et al*., 2002), high parity (Zhang and Savitz, 1993) and advanced maternal age (Taipale *et al*., 1998). Moreover, in some cases the results of the studies are contradictory and deserve further evaluation. Other potential risk factors with more confounding effect on the development of placenta previa include history of previous spontaneous or induced abortions (Wen *et al*., 2000), increasing number of previous cesarean sections (Dra_anei, 2002), previous placenta previa (Dashe *et al*., 2002) and child sex at birth (Demissie *et al*., 1999). As results of the studies in risk factors and outcome of placenta previa pregnancies vary around the world (Gilliam *et al*., 2002; Wen *et al*., 2000) we decided to evaluate potential risk factors and perinatal outcome of pregnancies complicated with placenta previa on pregnant women.

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MATERIALS AND METHODS

A population-based study was performed, comparing all deliveries complicated by placenta previa to deliveries without this complication. The study population consisted of all deliveries that occurred between 2001 and 2003 at our hospital in Zanjan, Iran. Data were retrieved from our perinatal database. The data collected included : Maternal age, parity, gestational age, previous cesarean section, pregnancy induced hypertension and birth weight. The following obstetric risk factors parity, maternal age, previous cesarean section, previous abortion and previous placenta previa were analyzed: The following birth outcomes were evaluated: Apgar scores at 5 min less than 7, fetal sex, pathologic presentation, birth weight less than 2500 g and NICU admission. Statistical analyses were performed with the SPSS package (Version 11.5). To test the statistical significance of the categorical variables, the chi-square test or Fisher's exact tests were used. The criterion for selection was $p<0.05$. Odds ratios (OR) and their 95% confidence interval (CI) were calculated from the regression coefficient.

RESULTS

Out of a total of 12834 deliveries at our Hospital during the study period, 93 were cases of placenta previa. The calculated incidence of placenta previa was 0.73% in our population of pregnant women. We analyzed potential risk factors for placenta previa development in the study population and controls (Table 1). The median age of pregnant women with placenta previa was significantly higher in women with placenta previa than in controls (27 vs 23, $p<0.01$). The distribution according to age groups revealed a significantly higher frequency of women older than 35 years in the placenta previa group than in the control group (25 vs 15%, respectively). Women with placenta previa were

Table 1: Maternal, pregnancy and delivery characteristics of women with and without placenta previa

	Cases N = 93		Controls N = 940				
Risk factors	n	n (%)	n	n (%)	Odds ratio	95%CI	p-value
Maternal age							
<35 years	70	75.0	799	85.0			
>35 years	23	25.0	141	15.0	0.69	0.57-0.83	p<0.001
Parity							
Nulliparous	20	21.5	480	51.0			
Multiparous	73	78.5	460	49.0	0.71	0.67-0.89	p<0.001
Previous cesarean section							
Yes	34	37.5	123	13.1			
No	59	63.5	817	87.9	11.5	3.91-33.41	p<0.0001
Pregnancy induced hypertension							
Yes	14	15.0	85	9.0			
No	79	85.0	855	91.0	0.72	0.68-0.92	p<0.0001
Gestational age							
<37 weeks	39	41.9	50	5.4			
>37 weeks	54	58.1	890	94.6	12.58	7.79-21.22	p<0.0001
Previous abortion							
Yes	28	30.1	47	5.0			
No	65	69.9	893	95.0	0.70	0.57-0.83	p<0.001
Placenta abruption							
Yes	33	35.5	47	5.0			
No	60	65.5	893	95.0	12.07	4.17-32.91	p<0.001
Previous placenta previa							
Yes	2	2.2	4	0.4			
No	91	97.8	936	99.6	5.17	5.61-7.62	p<0.0001

Table 2: Neonatal complications of placenta previa

	Cases N = 93		Controls N = 940				
Complication	n	n (%)	n	n (%)	Odds ratio	95%CI	p-value
Apgar score 5 min							
<7	23	24.7	25	2.6			
>7	70	75.3	915	97.4	0.71	0.74-0.97	p<0.0001
NICU admission							
Yes	29	30.9	67	7.1			
No	64	69.1	863	92.9	0.70	0.57-0.83	p<0.001
Birth weight							
<2500 g	38	40.9	57	6.1			
>2500 g	55	59.1	883	93.9	10.71	6.54-17.51	p<0.0001
Newborn sex							
Male	62	76.6	481	51.2			
Female	31	33.4	459	48.8	2.08	1.07-4.06	p<0.0001
Presentation							
Normal	47	50.5	85	9.0			
Abnormal	46	49.5	855	81.0	3.05	6.52-14.21	p<0.0001

more likely to be of higher parity (Table 1). The frequency of multiparous women was significantly higher in the group of women with placenta previa (78.5 vs 49%, p<0.001). Women with previous cesarean section had a 2.5 fold higher risk for placenta previa development (Table 1). Among women with placenta previa, there was a significantly higher frequency of those with previous cesarean sections. The number of previous spontaneous/induced abortions was also significantly higher in the group of women with placenta previa (30.1 vs 5%, p<0.0001). The rate of pathological fetal presentations was significantly higher in women with placenta previa than in the control group (50.5 vs 9%, p<0.0001) women in placenta previa group had the evidence of previous placenta previa and statistically significant predominance of male newborns was noticed in the placenta previa group in comparison with control group (76.6 vs 51.2%, respectively). The risk of having preterm delivery was almost 8 fold higher in the placenta previa group (41.9 vs 5.4%, p<0.0001). The maternal, pregnancy and delivery characteristics showed in Table 1. Infants of mothers with placenta previa had significantly lower 5th min apgar scores than their controls (OR = 0.71, CI = 0.74-0.97, p<0.0001). However infants of mothers with placenta previa had significantly lower birth weight than infants of the mothers in control group (40.9 Vs 6.1%, p<0.0001). Infants of mothers with placenta previa had significantly higher NICU admission than infants of the mothers in control group (30.9 Vs 7.1%, p<0.001) (Table 2).

DISCUSSION

Placenta previa complicated 0.4% of all deliveries, which was within the range of 0.3-0.8% observed in other studies (Love and Wallace, 1996; Frederiksen *et al*., 1999; Parazzini *et al*., 1994). Present study showed the incidence of placenta previa (0.73%) is in agreement with those studies. Several studies conducted around the world confirmed a 2-5 fold increased risk for placenta previa development in women with history of previous cesarean section (Frederiksen *et al*., 1999; Demissie *et al*., 1999). Present study confirmed that the frequency of previous cesarean sections was significantly higher in placenta previa group than in the control group, which corresponded to 2.5 fold higher risk for placenta previa development, is in agreement with those studies. The role of previous abortions, either spontaneous or induced, was proved to be important for placenta previa development in our population of pregnant women. The percentage of previous abortions was significantly higher among women with placenta previa (Taipale *et al*., 1998; Rasmussen *et al*., 2000). The mechanism how previous abortions predispose to placenta previa development could be explained with possible endometrial damage during repeated abortions, which impedes successful fundal implantation of

placenta. Present findings is in agreement with those studies. Contrary to some previous studies where an association between male sex of the newborn and placenta previa was observed (Dashe *et al*., 2002). Present study showed statistically in significant predominance of male newborns, is in agreement with those. The role of previous placenta previa, which implies genetic base for placenta previa development, was important in this study. Tow women with placenta previa had a history of placenta previa. However, there are some indications from other studies that previous placenta previa could be a risk factor for its development in current pregnancy. Gorodeski and Bahari (1987) found recurrence risk for placenta previa to be 6 times higher than in general population of pregnant women, our findings is in agreement with those. Obstetric and neonatal care significantly reduced perinatal mortality associated with placenta previa. However, preterm delivery still remains one of the main problems (Sheiner *et al*., 2001; Usta *et al*., 2005). In this study, 41.9% of women with placenta previa delivered prematurely and 19.2% of new orn had neonatal mortality. Present study is in agreement with it.

CONCLUSION

The results of present study indicate that knowing obstetric factors predisposing women for placenta previa development is important for choosing adequate preventive measures for these women. Physician should suspect placenta previa especially if woman is over 35 years of age, has had 3 or more previous pregnancies, parity of 2 and more and raising number of previous abortions and cesarean sections. These women should receive counseling as soon as pregnancy is confirmed. This is specially important in non-compliant women with possible poor antenatal care. Careful monitoring of these high-risk pregnancies is almost importance, especially regarding careful ultrasonographic examination with exact placental location during the second trimester of pregnancy. Early recognition and proper monitoring of placenta previa could minimize the possibility of poor outcome in sudden massive vaginal bleeding.

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