ORIGINAL ARTICLE

Risk factors of placental abruption

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Background: Placental abruption is one of the most common causes of bleeding during pregnancy. Multiple factors are known to be associated with increase of risk of placental abruption such as alcohol, cocaine use and cigarette smoking. The objective of this study was to identify risk factors for placental abruption in an Iranian women population. **Materials and Methods:** In a retrospective case – control study birth records included 78 cases with placental abruption and 780 randomly selected controls were investigated. Statistical analysis for comparing the studied risk factors between groups was performed using Pearson's Chi-square test along with presenting relevant odds ratio (OR). **Results:** From 7301 deliveries included in the study, 78 (1%) was complicated placental abruption. Women aged 35 or more likely for experiencing (OR = 3.650, 95% confidence interval [CL] = 1.57-6.83) and those who had a previous cesarean section (OR = 2.65, 95% CL = 3.91- 33.41) were in higher risk for placental abruption ([50 cases] 64% vs. [28 cases] 36% $P < 0.01$). **Conclusion:** The results indicate that among the placental abruption is one of the most common causes of bleeding during the pregnancy and one of the major obstetrical emergency.

Key words: Iran, placental abruption, pregnancy, risk factors

INTRODUCTION

Placental abruption is the most common cause of late pregnancy bleeding.[1] In humans, it refers to the abnormal separation after 20 weeks of gestation and prior to birth.[2] Placental abruption usually presents as combination of vaginal bleeding, uterine contractions, and pain.[3] The perinatal mortality rate varies between 20 and 67%, depending on gestational age, fetal weight, and the degree of abruption.[4] About half of perinatal deaths due to placental abruption occur in, which also makes this disorder a major contributor to stillbirth.[5] The etiology of placental abruption is unknown, but it occurs more for equinity among smokers, in hypertensive pregnancies, in pregnancies with intra uterine growth restriction (IUGR), in instances of trauma, with advancing maternal age, with male fetuses, and in women with a previous placental abruption.[6] Multiple factors are Known to be associated with increased risk of placental abruption as alcohol and cocaine use and cigarette smoking, but there are fewer studies about the importance of opioid abuse in placental abruption.[7]

Recently, Placental abruption has been reported to be more prevalent in thrombophilic pregnancies and in women with a familial history of venous thromboembolism. Most risk factors for placental abruption are also related to increased risk of venous Thromboembolism Lindquist.[2]

Abruption is often discovered when bright red or dark clotted blood is discharged from the vagina. However, bleeding from the vagina is not always the case.[8] Placental abruption, defined as complete or partial detachment of the placenta before delivery, is one of the most detachment of the placenta before delivery, is one of the most devastating pregnancy complications. Bleeding and pain consist the classical symptoms of placental abruption but the clinical picture varies from asymptomatic, in which the diagnosis is made by inspection of the placenta at delivery, to massive abruption leading to fetal death and severe maternal morbidity.[9]

Antepartum hemorrhage (APH) is a grave obstetrical emergency. Maternal and perinatal complications in APH are anemia, malpresentations, post-partum hemorrhage, shock, low birth weight, intrauterine death, and birth asphyxia.[10] One study showed that the economic and social status among the risk factors for placental abruption are related.[11] And also shown that placental abruption was significantly more common in the Bedouin population. Both populations demonstrated the same annual and seasonal patterns, with higher incidence in spring and autumn.

Due to the risk factors of preterm placenta can be attributed to the differences in the socio-cultural and economic backgrounds as well as health system efficacy

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in order to conducting the effective preventive treatments in this area; investigation of potential determinants of preterm placenta's risk factors will be necessary. Therefore, the aim of this study was to determine the risk factors for placental abruption in an Iranian women population.

MATERIALS AND METHODS

Study setting, subjects, and studied variables

This article is derived from a thesis No. 4311 that Zanjan University of Medical Sciences has been approved.

A local population-based case-control study was performed among all women (7301 women) who delivered between 2009 and 2012 at Wali Assr hospital in Zanjan, Iran, 78 placental abruption was observed and 780 women was chosen as the controls Cases and controls groups were age, sex, education, and socio-economic status matched.

- Pregnant women who had medical records and consent to be included to the research. All patients presenting with APH due to abruption placenta at any gestational age after 28 weeks to term were included in the study. Signs or symptoms of placental abruption, including: Vaginal bleeding, Abdominal pain, Severe back pain, Rapid uterine contractions–more than one contraction every 3 min.

Women having bleeding due to causes other than abruption were excluded

Also, the women with out medical records and informed consent were excluded.

The collected data from medical records included: Maternal age, previous cesarean section, parity, gestational age, pregnancy induced hypertension, previous placental abruption, previous premature rupture of membranes (PROM), and previous abortion. The following birth out comes were also records. Still birth, agar scores at 5 min after birth, birth weight lesser than 2500 g and neonatal intensive care unit (NICU) admission and IUGR.

Statistical analysis

Statistical analyses were performed with the SPSS package (SPSS Inc., Chicago IL (version 11.5)). To test the univariate relationship between variables for categorical variables, the Chi-square test or Fisher's exact (as appropriate) tests were used. Odds ratio (OR) and 95% confidence interval (CI 95%) were calculated.

RESULTS

A total of 7301 deliveries were occurred at our Hospital during the study period in which, 78 cases (1%) had placental abruption. We evaluated potential risk factors for placental abruption development using univariate method (i.e., Chi-square test) [Table 1]. The distribution of placental abruption in women older than 35 years was greater than those who were younger (39% vs. 21%, respectively, OR = 3.69, $P < 0.001$). The odds of being placental abruption for women experienced cesarean sections was significantly higher than counterpart ones (OR = 2.65, $P < 0.001$). Women with placental abruption were more likely to be of higher parity (OR=, $P<0.05$). The multiparous women was more significantly likely for being placental abruption than Nulliparous (64.5% vs. 49%, OR = 1.35, $P < 0.05$). The rate of preterm labors was significantly higher in women with placental abruption than in the control group (16% vs. 5%, $P < 0.001$). Women in placental abruption group had the evidence of previous placental abruption and there wash statistically significant difference between of the placental abruption group in comparison with control group (12% vs. 1%, respectively, $P < 0.0001$) previous PROM was positively associated with placental abruption (OR = 2.42, $P < 0.01$). The proportion of previous spontaneous/induced abortions was also significantly higher in the group of women with placental abruption (29% vs. 5%, OR = 2.71, $P < 0.01$).

Table 2 shows the comparative status of neonatal complication of two studied groups. The rate of stillbirth mortality in experimental group is 19% (15 cases) (OR = 2.67, $P < 0.01$). Infants of mothers with placental abruptions had significantly lower 5th-min Apgar scores than their controls (OR = 4.71, CI = 2.74-17.97, $P < 0.0001$). However, infants of mothers with placental abruption had significantly lower birth weight than infants of the mothers in control group (34% vs. 6%, $P < 0.0001$). Infants of mothers with placental abruption had significantly higher NICU admission than infants of the mothers in control group (31% vs. 7%, $P < 0.01$). Infants of mothers with placental abruption had significantly higher IUGR = (15% vs. 4%, $P < 0.01$).

DISCUSSION

The incidence of placental abruption among singlet on pregnancies is usually reported to range from 0.7% to 1% and The overall prevalence of APH among Arab women residing in Qatar was 15.3%with 6.7% among Qatari's and 8.6% among non-Qatari Arab women; the difference in ethnicities was not significant.[12] The study result showed the frequency of placenta abruption and placenta previa were 3.49% and 1.27% respectively.[13] Abbasi RM showed that Total number of cases admitted in labour ward was 2563**.** 48 (1.87%) women had abruption placentae and.[14] Our study showed the prevalence of placental abruption 1%.

The cause of abruption is truly unknown, but there are many conditions highly associated with placental abruption.

Table 1: Clinical characteristics of women with placental abruption and control groups

Risk factor	Cases (*n*=78)		Controls (*n*=780)		OR	95% CI for OR	*P* value
	N	(%)	*n*	(%)			
Age							
<35	48	61	616	79	3.69	1.57-6.83	<0.01
>35	30	39	164	21			
Previous cesarean section							
Yes	41	53	288	37.5	2.65	1.91-3.41	<0.001
No	37	47	492	62.5			
Parity							
Nulliparous	28	36	397	51	1.35	1.1-1.6	<0.05
Multiparous	50	64	383	49			
Gestational age							
<37 weeks	12	16	39	5	3.2	1.6-5.6	<0.001
>37 weeks	66	84	741	95			
Pregnancy induced hypertension							
Yes	9	12	62	8	0.92	0.42-2.26	>0.5
No	69	88	718	82			
Previous placental abruption							
Yes	9	12	8	1	12.07	4.17-32.91	<0.0001
No	59	88	772	99			
Previous PROM							
Yes	18	23	86	11	2.42	1.37-24.29	<0.01
No	60	77	694	89			
Previous abortion							
Yes	23	29	39	5	2.71	1.57-6.83	<0.01
No	55	71	741	95			

PROM=Premature rupture of membranes; OR=Odds ratio; CI=Confidence interval

Table 2: Fetal and neonatal outcomes of patients with placental abruption

Outcomes	Cases (*n*=78)		Controls (*n*=780)		Odds ratio	95% CI	*P* value
	n	%	*n*	%			
Stillbirth							
Yes	15	19	20	3	2.67	3.92-9.97	<0.01
No	63	81	760	97			
APGAR 5 min							
<7	8	11	23	3	4.71	2.74-17.97	<0.0001
>7	70	89	754	97			
Birth weight							
<2500 g	26	34	46	6	10.71	6.54-17.51	<0.0001
>2500 g	52	66	734	94			
NICU admission							
Yes	31	40	54	7	1.92	1.81-5.99	<0.01
No	47	60	796	93			
IUGR							
Yes	12	15	29	4	3.62	1.73-8.97	<0.01
No	66	85	731	96			

APGAR=Appearance pulse grimace (reflex) activity respiration; NICU=Neonatal intensive care unit; IUGR=Intra uterine growth restriction

Conditions that increase the risk of abruption include: Smoking, toxemia, and having either twins or triplets.[15] Other risk factors include: Drug use, particularly tobacco, alcohol, cocaine, and opioid.[7,16]

Maternal age: Pregnant women who are younger than 20 or older than 35 years had greater risk for placental abruption.[7,13-17] Our finding is in agreement with those studies.

Several studies conducted around the world confirmed a 2-5 fold increased risk for placental abruption development in women with a history of previous cesarean section.[7,13-19]

Our study confirmed that the frequency of previous cesarean sections was significantly higher in placental abruption group than in the control group, which corresponded to 1.5 fold higher risk for placental

abruption development, is in agreement with those studies. Furthermore, multi-parity was a risk factor for abruption.[11,20] In this study, multiparous women had a greater risk of placental abruption 1.5 fold than controls, is in agreement with those. Preterm delivery also one of the main problems for placental abruption development.[21] Our study confirmed that the frequency of preterm delivery sections was significantly higher in placental abruption group than in the control group. Women who had an abruption in previous pregnancies are at greater risk. The role of previous placental abruption, which implies genetic base for placental abruption development and Zdoukopoulos showed that multi factorial etiology of abruption and the relatively small numbers of studies and participants, this review provides only the first clues of possible genetic causes.[22]

There are some indications from other studies that previous placental abruption could be a risk factor for its development in current pregnancy.[23]

Our Study confirmed that the frequency of previous placental abruption was significantly higher in placental abruption group than in the control group.

Similarly to some previous studies where an association between PROM and placental abruption was observed.[24] And Markus showed in p-PROM the risk of placental abruption is not higher than in other preterm births; rather the opposite. However, comparing the risks in p-PROM and the total gestational age range, the present study confirmed results reported in previous studies of a higher risk of placental abruption in PROM than in the total birth population.[25]

Our study showed statistically in significant predominance of PROM, is in agreement with those. The mechanism how previous abortions pre-dispose to placental abruption development could be explained with possible endometrial damage during repeated abortions, which impedes successful fund a implantations of placenta.[26] Our findings showed 29% of women had a history of previous abortion had a greater risk for placental abruption, is in agreement with those studies.

Neonatal out comes as a result of APH Included increased risk of Apgar score at 1 min < 7 (P = 0.04) and minor congenital anomaly (P = 0.004).[12]

And Sarwar showed that I obstetric and neonatal care significantly reduced perinatal mortality associated with placental abruption

In our study, 19% (15 Cases) of fetal had still birth and 11% of new born had agar 5 min less than 7 after birth. Signal showed that APH is a grave obstetrical emergency that Leads to low birth weight, intrauterine death, and birth h asphyxia.[11]

Furthermore, 34% (26 cases) of newborn had weight less than 2500 g and 40% (31 cases) of infants were in NICU admission. Placental abruption with these clinical characteristics should be closely monitored and prompt delivery should be carried out at tertiary care centers with adequate maternal-neonatal intensive care facilities. Despite heightened awareness, placental abruption still remains unpredictable and unpreventable. A clinically useful predictive test is needed to detect individuals at risk.[9] Antenatal care plays a significant role in decreasing the incidence of abruption placenta.[14]

CONCLUSION

Placental abruption, a medical and obstetrical emergency, is a serious obstetric condition, especially in our country. Physicians must be aware that patients within case of multiparty, cesarean section, previous abortion, and placental abruption are at increased risk of placental abruption. Early diagnosis, prenatal follow-up, and cesarean section improve the maternal and fetal prognosis.

The findings emphasize that better care could be reduce serious complication of the diseases possible.

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