

Late Pregnancy Outcomes in Women with Vaginal Bleeding in Their First Trimester

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Abstract

Purpose First trimester vaginal bleeding (FTVB) does not usually terminate the pregnancy. However, its outcome is a matter of debate. This study sought to assess the outcomes of pregnancies, complicated by FTVB.

Methods In this cohort study, 236 gravida 1 and 2 FTVB patients with delivery after 28 weeks of gestational age, admitted to Imam Hossein Hospital during 2009–2010, were evaluated. The control group consisted of 944 gravida 1 and 2 women without any history of vaginal bleeding. Late pregnancy outcomes such as gestational hypertension, preeclampsia, placental abruption, preterm delivery, and premature rupture of membranes in the mothers and low birth weight (LBW), intrauterine growth restriction (IUGR), Apgar score at 5 min <7, and NICU admission in the infants were evaluated. Logistic regression was used for estimation of odds ratios (OR) and 95 % confidence interval.

Results Compared to controls, the FTVB cases had more premature rupture of membranes (OR = 10), gestational hypertension (OR = 5.3), and placental abruption (OR = 4.7), while their infants had higher odds of LBW, IUGR, Apgar score at 5 min <7, and admission to NICU too.

The incidence of premature rupture of membranes was 3.6 % in the controls and 27.1 % in the cases (RR = 10, $P < 0.001$). The incidence of gestational hypertension and LBW was 1.5 and 7.2 % ($P < 0.001$) in the controls and 6.6 and 12.3 % ($P < 0.001$) in the cases. The other outcomes were similar in both groups.

Conclusion FTVB may play a role in the development of late pregnancy outcomes in mothers and infants. Thus, it is recommended to evaluate some interventions on FTVB cases to prevent complications.

Keywords Vaginal bleeding · Pregnancy outcome

Introduction

Late pregnancy outcomes in mothers and infants are among the main concerns of gynecologists and obstetricians [1–3]. The incidence of some complications like premature rupture of membranes [1–6] and low birth weight in some studies has been reported as high as 5–10 % [1–4, 6]. At present, factors such as history of preterm delivery, maternal systemic diseases, some vaginal infections, trauma, fetal anomalies, etc., are believed to play a role in development of late pregnancy complications in both the mother and infant [1, 2]. These complications can cause mortality and morbidity in the mother and infant [1–3]. Vaginal bleeding in the first trimester of pregnancy also plays a role in occurrence of late pregnancy complications [4–7]. Although a consensus has been reached on this subject, there is still controversy about the incidence of

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different complications. Some studies have reported a lower incidence rate for preterm delivery and low birth weight, while some others have mentioned higher values [6–9]. Considering the lack of information on this subject and also the significance of late pregnancy outcomes, the present study was conducted on pregnant women with a history of vaginal bleeding in the first trimester of their pregnancy and control subjects with no vaginal bleeding presenting to Imam Hossein Hospital during 2009–2011. The cases and controls were matched and the incidence of late pregnancy complications was evaluated in both the mothers and infants.

Materials and Methods

This cohort study was conducted on pregnant women with a history of vaginal bleeding in the first trimester of their pregnancy and matched controls with no vaginal bleeding.

Gravida 1 and 2 pregnant women with single normal pregnancy who consented to participate in the study were enrolled. Ultrasound demonstrated an intrauterine pregnancy and normal fetal heart rate. Those who suffered complete or partial miscarriage, had molar pregnancy, fetal anomaly, or for some reason had terminated their pregnancy earlier than 28 weeks of gestational age were excluded from the study. The cases and controls were matched in terms of age, parity, level of education, smoking status, BMI lower or higher than 26, and working during pregnancy.

The sample size was estimated based on the incidence of preterm delivery and premature rupture of membranes with CI 95 % and a power of 90 %. The minimum number of cases was calculated as 230 subjects and both groups were followed till delivery. Late pregnancy complications were evaluated in two categories of maternal complications and fetal complications. Maternal complications included premature rupture of membranes, preterm delivery, gestational hypertension, preeclampsia, placenta previa, placental abruption, and Cesarean section delivery. Fetal complications included low birth weight, intrauterine growth restriction, Apgar score at 5 min <7, and NICU admission.

First, a statistical test was used to insure that the two groups of cases and controls match. In the next step, the incidence of maternal and fetal complications was evaluated with Chi square test. If the difference was statistically significant, R–R was calculated and its actual rate was estimated in the community with 95 % CI.

Results

This study was conducted on 236 pregnant women with vaginal bleeding in the first trimester of their pregnancy

and 944 controls who met the inclusion criteria. The cases and controls were matched in terms of socioeconomic status (admitting to the same hospital) and time of admission. The frequency distribution of related factors in patients with vaginal bleeding and controls is presented in Table 1. The two groups were matched in terms of age, parity, level of education, history of previous miscarriage, smoking during pregnancy, BMI before pregnancy, and working during pregnancy. No statistically significant difference was detected in this respect between the cases and controls.

Table 2 summarizes the frequency distribution of late pregnancy outcomes in pregnant women with a history of vaginal bleeding in the first trimester of their pregnancy. Among the controls, 34 subjects (3.6 %) experienced premature rupture of membranes, while this rate was 64 subjects (27.1 %) among our case group ($P < 0.001$). It means that if vaginal bleeding occurs in the first trimester of pregnancy, the risk of premature rupture of membranes increases tenfold and its actual rate with 95 % CI will be 6.4–15.6 %. Also, 14 subjects (1.5 %) in the control group had gestational hypertension compared to 17 subjects (7.2 %) in the case group ($P < 0.001$ and OR = 5.2).

Placental abruption occurred in seven controls (0.7 %) and eight subjects (3.4 %) ($P < 0.004$), which indicates that the OR for occurrence of this condition among the case group was 4.7 times the control group. The prevalence of preterm delivery was 16.9 % in the controls and 18.6 % in the cases ($P < 0.5$). The incidence of preeclampsia was 4.4 % among the controls and 7.2 % among the cases. The prevalence of placenta previa was 0.5 % and 1.7 % among the controls and cases, respectively. The prevalence of C-section delivery was 53.2 % in the control and 51.13 % in the case group. The difference in preterm delivery, preeclampsia, placenta previa, and C-section delivery between the two groups was not statistically significant ($P < 0.9$).

The frequency distribution of complications that occurred in the infants of women with a history of vaginal bleeding in the first trimester of their pregnancy is presented in Table 3. Low birth weight of the infant was reported in 62 controls (6.6 %) and 29 cases (12.03 %) ($P < 0.003$). If a woman suffers from vaginal bleeding in the first trimester of her pregnancy, her infant will have two times the risk of low birth weight (OR = 2) and with 95 % CI, the OR of low birth weight will increase from 1.3–3.2. The incidence of intrauterine growth restriction (IUGR) was 2.3 and 6.4 % in the control and case groups, respectively ($P < 0.003$). The OR of IUGR increases 2.8-fold in cases with positive history of vaginal bleeding in the first trimester of pregnancy. The prevalence of Apgar score at 5 min <7 was 5 and 17.4 % in the control and case groups, respectively ($P < 0.001$). The frequency of NICU admissions was 4.2 % among the controls versus 18.2 %

Table 1 Frequency distribution of related factors in pregnant women with a history of bleeding in the first trimester of their pregnancy

Bleeding in 1st trimester	Related factors											
	Age	Parity	Academic education		History of previous miscarriage		Smoking		BMI		Working during pregnancy	
	0	1	>12	No <12	No	Yes	No	Yes	<26	≥26	No	Yes
Controls (N = 944)	29 (16–42)	537 (57)	722 (76.5)	222 (23.5)	852 (90)	92 (10)	927 (98)	17 (2)	789 (83.5)	155 (16.5)	794 (84)	150 (16)
Cases (N = 236)	29 (18–38)	151 (64)	172 (73)	64 (27)	198 (84)	38 (16)	228 (97)	8 (3)	202 (86)	34 (14)	204 (86.5)	32 (13.5)

among the cases ($P < 0.001$), which means that the OR of NICU admission increases by five times in the infants of mothers with a history of vaginal bleeding in the first trimester of their pregnancy.

Discussion and Conclusion

This study revealed that vaginal bleeding in the first trimester of pregnancy is associated with an increased risk of premature rupture of membranes, gestational hypertension, and placental abruption in mothers and low birth weight, intrauterine growth restriction, Apgar score at 5 min <7 , and NICU admission in infants. However, it had no statistically significant influence on other maternal or fetal complications.

In a study by Hossain on 2,678 deliveries in 2007, premature rupture of membranes was not reported, but there was an increased risk of preterm delivery among women with a history of vaginal bleeding in the first trimester of their pregnancy. However, it should be noted that in his study, all pregnant women were evaluated and matching was not performed [3]. In a study by Yang et al., the risk of premature rupture of membranes in pregnant women with a history of bleeding in the first trimester of their pregnancy was similar to that of our study. The only difference is the fact that Yang evaluated patients with a history of vaginal bleeding in the first and second trimesters of their pregnancy, while we only evaluated those who had bleeding within their first trimester [5]. However, in Williams' [6] study, no association was detected between premature rupture of membranes and vaginal bleeding in the first trimester, whereas these women had twice the risk of preterm delivery. In contrast to his study, in the present study, although the incidence of preterm delivery among the cases was higher than the controls, this increase was not statistically significant.

Asim et al. [9], in their study on 59 pregnant women with vaginal bleeding and sub-chorionic hematomas, reported an increased risk of preterm delivery. Also, Yang et al. [5], in their study on 56 women with vaginal bleeding in the first and second trimesters of their pregnancy, reported a doubled risk of preterm delivery in these subjects regardless of the volume or number of bleedings. Bleeding may result in preterm delivery by destruction of the chorioamniotic space and development of chronic inflammation. Sub-chorionic hematomas can cause uterus contractions.

In our study, the risk of placental abruption was higher among women with a history of early pregnancy vaginal bleeding, which is in accordance with the findings of Weiss et al., [8] and Ananth et al., [10]. However, such

Table 2 Frequency distribution of late pregnancy outcomes in women with a history of vaginal bleeding in the first trimester of their pregnancy

	Controls	Cases	<i>P</i> value	OR (95 % CI)
Premature rupture of membranes	34 (3.6)	64 (27.1)	>0.001	10 (6.4–15.6)
Gestational hypertension	14 (1.5)	17 (7.2)	>0.001	5.2 (2.5–10.6)
Placental abruption	7 (0.7)	8 (3.4)	>0.004	4.7 (1.7–13.1)
Preeclampsia	42 (4.4)	17 (7.2)	0.9	1.7 (0.9–3)
Placenta previa	5 (0.5)	4 (1.7)	0.85	3.2 (0.9–12.1)
Cesarean section	502 (53.2)	121 (51.3)	0.6	1.1 (0.8–1.4)

Table 3 Frequency distribution of complications in the infants of mothers with a history of vaginal bleeding in the first trimester of their pregnancy

	Controls (944)	Cases (236)	<i>P</i> value	OR (95 % CI)	AOR (95 % CI)
Low birth weight	62 (6.6)	29 (12.3)	>0.003	2 (1.3–3.2)	2 (1.2–3.2)
IUGR	22 (2.3)	15 (6.4)	>0.002	2.8 (1.5–5.6)	2.7 (1.4–5.6)
Apgar score at 5 min <7	47 (5)	41 (17.4)	>0.001	4 (2.6–6.3)	4.1 (2.6–6.4)
NICU admission	40 (4.2)	43 (18.2)	>0.001	5 (3.2–8)	5.1 (3.2–8)

correlation was not detected in Wijesiriwardana and Johns' studies [7, 11].

We did not find an association between preeclampsia and early pregnancy vaginal bleeding, which is in contrast to the study by Weiss et al., who detected such correlation [8].

In our study, the prevalence of gestational hypertension was higher in women with a history of vaginal bleeding in the first trimester of their pregnancy. This finding was in agreement with the study of Johns [10], but in contrast to Wijesiriwardana's [7].

In the present study, the rate of C-section delivery was higher in the control group, but this difference was not statistically significant. This finding is in contrast to the studies by Weiss et al., [8] and Wijesiriwardana et al. [7], which demonstrated higher prevalence of C-section delivery among women with a history of bleeding in the first trimester of their pregnancy.

We also found a higher incidence of placenta previa in our case group, which was not statistically significant. Dongol et al. [12] reported a clearly elevated risk of placenta previa in women with a history of early pregnancy vaginal bleeding. However, such an increased risk was not reported in Hossain's study [3].

Intrauterine growth restriction and low birth weight were among the conditions observed in infants of women with early pregnancy vaginal bleeding in our study. Similar findings were reported by Dongol et al., [10–12] and Asim et al. [9]. However, Wijesiriwardana failed to find a significant association between vaginal bleeding in the first trimester of pregnancy and intrauterine growth restriction [7]. It seems that intrauterine growth restriction may be due to some degree of placental insufficiency secondary to scarring of the bleeding site.

One of the limitations of this study was the fact that the severity and volume of vaginal bleedings were not measurable and we had to accept the patients' accounts of it. Thus, this study could not cast a judgment regarding the relationship of severity of vaginal bleeding and late pregnancy outcomes. On the other hand, women with small amounts of vaginal bleeding who did not mention it may have been excluded from the study. Another limitation was the difficult follow-up of patients. Despite our advice regarding continuing pregnancy care in this medical center, many patients chose other centers for their follow-up or delivery, and therefore we had to exclude them from the study. However, we tried our best to match the cases and controls through correct estimation of the required sample size (both cases and controls) and setting precise inclusion and exclusion criteria. It is noteworthy that we did not have any bias in this study and appropriate statistical tests were applied.

In conclusion, it seems that vaginal bleeding in the first trimester of pregnancy increases the risk of some complications, i.e., premature rupture of membranes, gestational hypertension, and placental abruption in mothers and low birth weight, IUGR, low Apgar score, and NICU admission in infants. Considering the fact that our study has the most accurate analytical design, we recommend conduction of an experimental study in this regard to decrease late pregnancy outcomes in women with a history of vaginal bleeding.

Women with vaginal bleeding in the first trimester of their pregnancy have a higher risk of unwanted pregnancy outcomes and therefore require better care and consultation and they have to be referred to more equipped medical centers to reduce the risk of these complications. Also, this is a warning sign for health care professionals to consider

such cases as high-risk pregnancies and treat them accordingly.

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