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IUGR occurrence in Pregnant Women with First Trimester Vaginal Bleeding

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ABSTRACT— Vaginal bleeding complicates a percentage of all pregnancies. Previous study has connected vaginal bleeding to a twofold increase in risk, with the risk being higher in some, but not all, studies for heavy, recurrent, and late pregnancy bleeding. In both the first and second pregnancies, intrauterine growth restriction (IUGR) is a significant cause of perinatal morbidity and mortality. The goal of this study is to investigate the link between vaginal bleeding and IUGR. This prospective cohort study included 68 case of pregnant female with first trimester vaginal bleeding at Obstetrics& Gynecology Department, Faculty of Medicine, Zagazig University. The duration of the study was from February 2021 to December 2021. At the end of the study 56 cases completed the study. Clinical examination revealed that the fundal height of the uterus was at least 4 weeks lower than the expected height based on gestational age. Vaginal haemorrhage was classified as minor when the lady did not need hospitalisation and significant when she did. There were correlations discovered between vaginal bleeding and delivery outcomes, notably IUGE. There was significant decrease in birth weight and Apgar score with increase severity of vaginal bleeding. There was significant increase in NICU admission and IUGR occurrence with increase severity of vaginal bleeding. There was a significant positive relationship between vaginal haemorrhage, IUGR, and NICU hospitalisation. Vaginal haemorrhage, birth weight, and APGAR score all had a significant adverse connection. There was significant association between vaginal bleeding and IUGR occurrence. There was no significant difference between mild and moderate or moderate and severe vaginal bleeding. First trimester vaginal bleeding is significantly associated with IUGR occurrence and other pregnancy adverse outcomes. Also IUGR occurrence and other pregnancy adverse outcomes prevalence increase with increase severity of bleeding. We found no difference in IUGR occurrence in mild versus moderate or moderate versus severe vaginal bleeding.

KEYWORDS: IUGR, Pregnancy, First trimester, Vaginal bleeding.

1. INTRODUCTION

Vaginal bleeding complicates a percentage of all pregnancies. Previous study has connected vaginal bleeding to a twofold increase in risk, with the risk being higher in some, but not all, studies for heavy, recurrent, and late pregnancy bleeding. Several studies examined heaviness, recurrence, and bleeding trimester, but none examined the effects of bleeding duration and volume. Because almost half of all pregnant bleeding episodes have unknown sources, it is uncertain why vaginal bleeding predicts early birth [1]. Vaginal haemorrhage and thrombin generation set off a proteolytic cascade that has the potential to impair foetal blood flow [2].

In both the first and second pregnancies, intrauterine growth restriction (IUGR) is a significant cause of perinatal morbidity and mortality. It has been shown that IUGR affects around 10-15% of pregnant women. There are no documented preventive or therapeutic strategies at this time [3]. Recent advancements in research have focused on IUGR detection and prediction, especially to optimise delivery time. Understanding the dynamics of normal prenatal development is crucial for determining IUGR pathogenesis [4].

Several criteria and terminologies have been used in the literature to define IUGR, including but not limited to estimated foetal weight of 25%, 15%, 10%, 5%, 3%, 2.5%, and 1% for gestational age. Other IUGR criteria include an estimated weight less than two standard deviations below the mean weight and an abdomen circumference equal to 10% of the gestational age. Both the ACOG and the RCOG have defined IUGR as foetal weight less than the 10th percentile [5].

Among the most common risk factors are maternal causes (hypertension, diabetes, cardiopulmonary disease, anaemia, malnutrition, smoking, drug use), foetal causes (genetic disease including aneuploidy, congenital malformations, foetal infection, multiple pregnancies), and placental causes (placental insufficiency, placental infarction, placental mosaicism) [6].

We found to study correlate between IUGR and vaginal bleeding. In this study we aim to evaluate association between vaginal bleeding and IUGR.

2. Material and methods

This prospective cohort study included 68 case of pregnant female with first trimester vaginal bleeding at Obstetrics& Gynecology Department, Faculty of Medicine, Zagazig University. The duration of the study was from February 2021 to December 2021. At the end of the study 56 cases completed the study.

Inclusion criteria: Pregnancy length and vaginal bleeding during the first trimester The amniotic membrane remained intact throughout the 28-38 week gestation period. At fewer than 20 weeks' gestation, gestational age is calculated based on the specific date of the preceding menstrual cycle, which is validated by ultrasound examination. Sure determines gestational age. Ultrasound verified the previous menstrual cycle. An examination is conducted before 20 weeks of pregnancy. Sure determines gestational age. Ultrasound verified the previous menstrual cycle. An examination is conducted before 20 weeks of pregnancy. The gestational age is at least 4 weeks older than the ultrasound age (measured from the first day of the prior menstrual cycle or the first verified ultrasound).

Exclusion criteria: Fetuses having chromosomal or structural abnormalities. Foetuses show substantial foetal vascular abnormalities at the time of recruitment (brain sparing, absent or reversed flow in uterine artery). The delivery date is still up in the air.

On clinical assessment, the fundal height of the uterus was found to be at least 4 weeks lower than the predicted height based on gestational age. Ultrasonographic confirmational investigations were performed using VOLUSON 730 PRO V to detect Fetal biometric measures. IUGR Fetal abdominal circumference < 5th percentile.

When the woman did not need hospitalisation, the vaginal haemorrhage was classed as mild, and when she did, it was labelled as substantial. Correlations between vaginal bleeding and birth outcomes specially IUGE were determined.

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2.1 Statistical Analysis

IBM SPSS version 22.0 was used to analyses computer-generated data. To express quantitative data, percentages and numbers were employed. Before utilizing the median in nonparametric analysis or the interquartile range in parametric analysis, it was required to perform Kolmogorov-Smirnov tests to ensure that the data were normal. We used the (0.05) significance threshold to establish the significance of the findings. The Chi-Square test is used to compare two or more groups. The Monte Carlo test may be used to adjust for any number of cells with a count less than 5. Fischer Chi-Square adjustment was applied to tables demonstrating non continuous data.

3. Results

Table (1): Maternal basal characteristics

Parameters	Value (N = 56)
Age (years)	30.5± 8.1
Gravidity	3.6± 1.7
Parity	1.8± 1.5
Mode of delivery CS Vaginal delivery	 38 (67.9%) 18 (32.14%)

CS: Cesarean Section

Mean maternal age was 30.5 years with SD of 8.1. Mean gravidity was 3.6 with SD of 1.7 and Parity of 1.8 with SD of 1.5. Normal vaginal delivery was in 18 (32.14% of cases) and cesarean section in 38 (67.9%) of cases Table 1.

Table (2): Severity of vaginal bleeding

Severity	Value (N = 56)
Mild	32 (57.14%)
Moderate	15 (26.79%)
Severe	9 (16.07%)

Mild, moderate and severe vaginal bleeding was seen in 57.14%, 26.79% and 16.07% cases respectively Table 2.

Table (3): Different managements of cases

Management	Value (N = 56)
Conservative treatment	16 (28.57%)
Medical curettage	7 (12.5%)
Uterine curettage	22 (39.29%)
Right salpingectomy	7 (12.5%)
Left salpingectomy	4 (7.14%)

Regarding management, Conservative treatment, Medical curettage, Uterine curettage, Right salpingectomy and Left salpingectomy was in 16, 7, 22, 7 and 4 cases respectively Table 3.

Table (4): IUGR occurrence

Occurrence	Value (N = 56)
Yes	5 (8.93%)
No	51 (91.07%)

IUGR occurred in 5 (8.93 %) cases Table 4.

Table (5): Comparison between cases with mild, moderate and severe vaginal bleeding regarding fetal outcomes.

	Mild Vaginal Bleeding (N = 32)	Moderate Vaginal Bleeding (N = 15)	Severe Vaginal Bleeding (N = 9)	P. Value
Birth weight	3.0294 ± 0.48	2.54 ± 0.57	2.01 ± 0.44	<0.001*
APGAR score	7.9 ± 3.6	6.7 ± 3.3	5.4 ± 2.1	0.022*
NICU Admission	2 (5.9%)	4 (26.7%)	3 (33.3%)	0.04*
IUGR occurrence	0	2 (13.33%)	3 (33.33%)	0.005*

NICU: Neonatal intensive care unit | IUGR: Intra Uterine Growth Retardation

There was significant decrease in birth weight and Apgar score with increase severity of vaginal bleeding. There was significant increase in NICU admission and IUGR occurrence with increase severity of vaginal bleeding Table 5.

Table (6): Correlation between Vaginal bleeding and other parameters

Parameters	Vaginal Bleeding	
	r	P. Value
IUGR	.422**	0.0012
BW	-.750**	<0.001
APGAR	-.703**	<0.001
NICU Admission	.304*	0.0226

r: Pearson Correlation

*: P<0.05 significant | **P<0.001 High significant

There was significant positive correlation between vaginal bleeding and IUGR and NICU admission. There was significant negative correlation between vaginal bleeding and Birth weight and APGAR score Table 6.

Table (7): Roc curve analysis of vaginal bleeding and IUGR occurrence.

	AUC	Sts. Error	Asymptotic 95% CI	P. Value
Mild, Moderate & Severe	**0.867**	**0.06**	**0.75-0.98**	**0.007***
Mild Vs. Moderate	**0.856**	**0.075**	**0.709-1.00**	**0.092**
Moderate Vs. Severe	**0.642**	**0.144**	**0.36-0.924**	**0.337**
Mild Vs. Severe	**0.921**	**0.046**	**0.831-1.00**	**0.016***

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*P<0.05 Significant

There was significant association between vaginal bleeding and IUGR occurrence. There was no significant difference between mild and moderate or moderate and severe vaginal bleeding Table 7 and Figure (1-4).

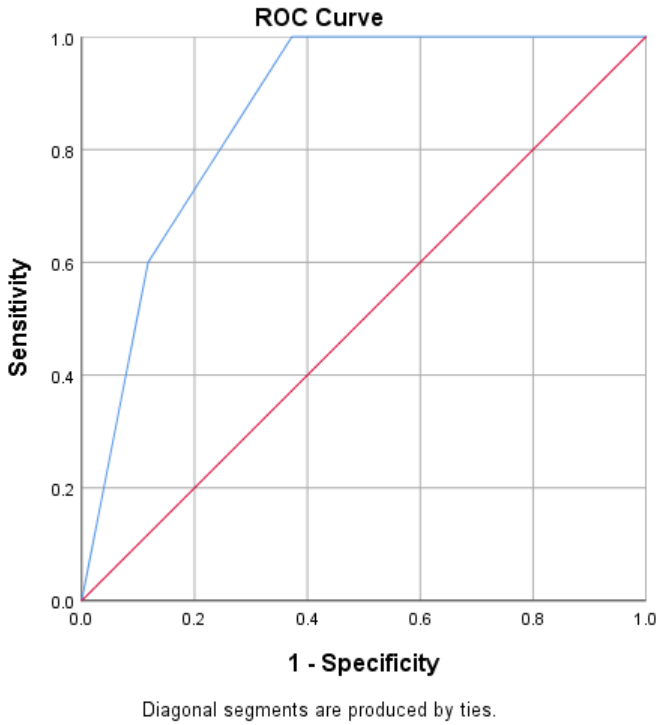

Figure (1): Roc curve analysis of IUGR association with vaginal bleeding.

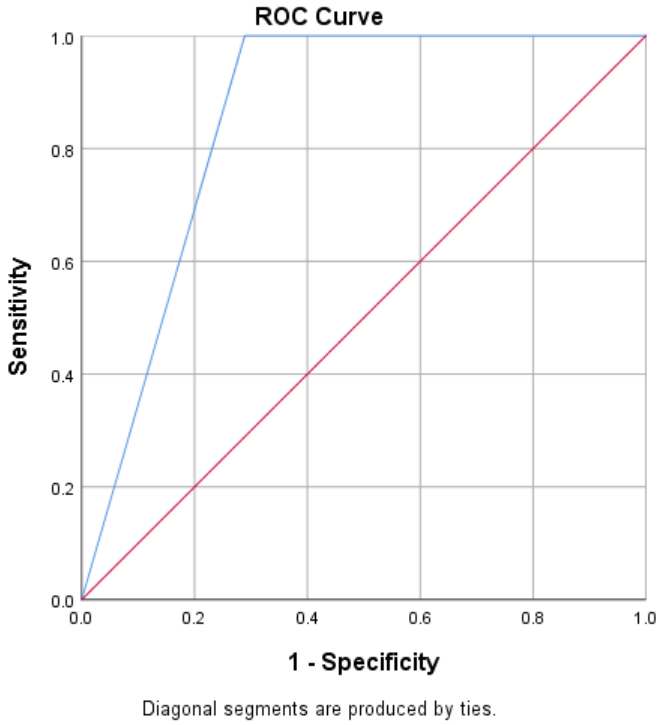

Figure (2): Roc curve analysis of IUGR association with Mild vs. moderate vaginal bleeding.

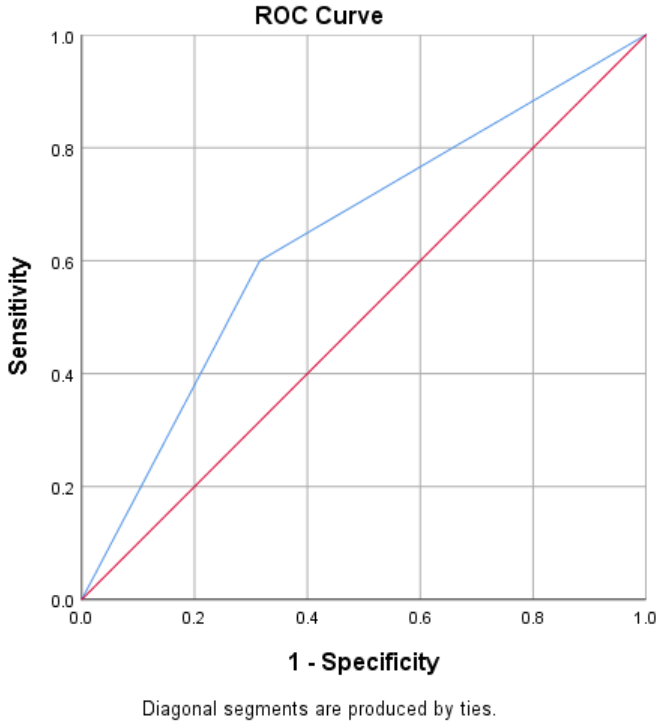

Figure (3): Roc curve analysis of IUGR association with Severe vs. moderate vaginal bleeding.

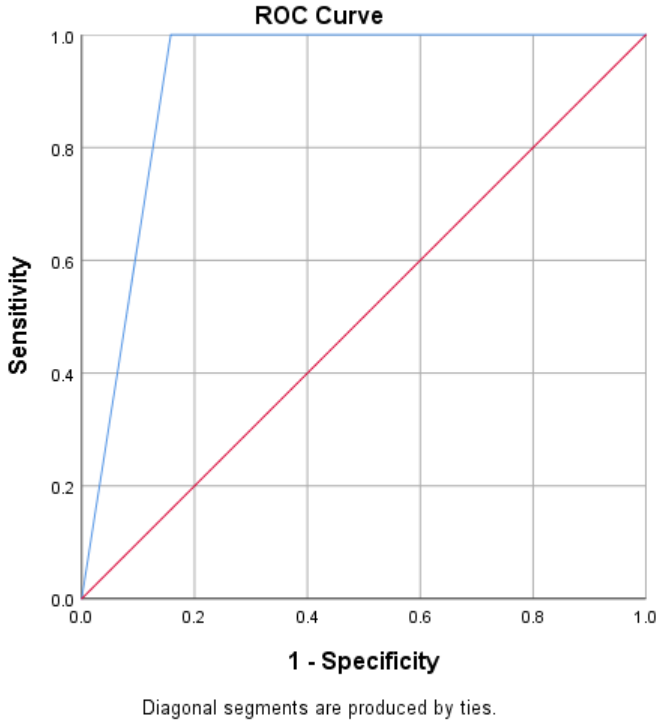

Figure (4): Roc curve analysis of IUGR association with Severe Vs. Mild vaginal bleeding.

4. Discussion

Vaginal bleeding may be a natural indication of pregnancy implantation, the start of a spontaneous abortion, or a symptom of a pathologic condition such ectopic pregnancy or prenatal trophoblastic sickness [7]. Vaginal bleeding after a positive pregnancy test need additional research to determine if the pregnancy is

developing regularly or abnormally, or whether there is a pathologic problem that necessitates intervention [8].

The significant variation in reported rates of gestational vaginal bleeding among pregnancies that last longer than 28 weeks is due to variances in study design and populations investigated, rather than genuine biological differences [9]. In this study, we looked at a situation that is rather common throughout pregnancy but often creates concern about the pregnancy's prognosis [10]. The investigation of vaginal bleeding is centred on two issues: its significance as a predictor of IUGR incidence and poor pregnancy outcome.

In our study regarding management, Conservative treatment, Medical curettage, Uterine curettage, Right salpingectomy and Left salpingectomy was in 16, 7, 22, 7 and 4 cases respectively.

Mild, moderate and severe vaginal bleeding was seen in 57.14%, 26.79% and 16.07% cases respectively. Against our results [12] reported more prevalence of heavy vaginal bleeding.

[11] observed that the risk of low birth weight among kids born to mothers who bled during pregnancy is two to three times higher than in those who did not. The total prevalence of low birth weight neonates in the population is 3.9 percent, which is likewise low by worldwide standards. Taking everything into consideration, it is possible to infer that the proportionate impact of bleeding is bigger in this series than in the majority of the others.

IUGR occurred in 5 (8.93 %) cases. This prevalence is similar to [15], who reported a prevalence of 6.4%.

In our study There was significant decrease in birth weight and Apgar score with increase severity of vaginal bleeding. There was significant increase in NICU admission and IUGR occurrence with increase severity of vaginal bleeding. Also, there was significant positive correlation between vaginal bleeding and IUGR and NICU admission. There was significant negative correlation between vaginal bleeding and Birth weight and APGAR score.

In our study NICU admission was observed in 9 (16.07%) cases, it was close to percentage reported by [15] as it reported NICU admission of 18.2% with Odd ratio of 5 (3.2-8). Also there was significant association between NICU admission and a history of vaginal bleeding in the first trimester of patients pregnancy. In the same study, there was a significant connection between IUGR and vaginal bleeding.

According to [13] patients who had vaginal bleeding had a considerably lower birth weight than patients who did not experience vaginal haemorrhage (median 750 grammes, range 520-1820 grammes vs. 2800 grammes, range 520-4880 grammes). It is similar to our study in that there was a significant decrease in birth weight as the degree of vaginal bleeding increased. Furthermore, [14] discovered that the prevalence of low birth weight was higher in bleeders ($P < 0.001$), and highest of all (11.7 percent) in women experiencing second trimester bleeding.

[14] observed that vaginal bleeding significantly reduced foetal intrauterine growth. Second trimester bleeding was also shown to have the highest risk of low birth weight (OR 4-1; 95 percent CI 2.6-6.4) and to be significant ($P < 0.01$) for infants who were small for gestational age (OR 2.5; 95 percent CI 1.34.9).

It seems that we are the first study to associate between different vaginal bleeding categories and IUGR

occurrence. There was no difference between mild and moderate vaginal bleeding and IUGR occurrence, either between moderate and severe vaginal bleeding and IUGR occurrence. May be due to closeness of lost blood between successive vaginal bleeding categories. Also may be due to physiological role of placental, fetal and maternal vascular system to comply lost blood.

The placenta's low-resistance circulation causes peripheral vasodilation and an increase in circulating volume. Increased heart rate, preload, and myocardial contractility, as well as decreased afterload, all enhance cardiac function during pregnancy by improving cardiac output.

5. Conclusion

First trimester vaginal bleeding is significantly associated with IUGR occurrence and other pregnancy adverse outcomes. Also IUGR occurrence and other pregnancy adverse outcomes prevalence increase with increase severity of bleeding. We found no difference in IUGR occurrence in mild versus moderate or moderate versus severe vaginal bleeding.

Conflict of interest: The authors declare no conflict of interest.

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Author contribution: Authors contributed equally in the study.

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