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Impact of First Trimester Vaginal Bleeding on Pregnancy Outcomes in A Tertiary Care Setting

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ABSTRACT
First trimester vaginal bleeding is a common obstetric complication associated with increased risks of adverse pregnancy outcomes. This study evaluates the impact of first trimester vaginal bleeding on pregnancy outcomes within a tertiary care setting, aiming to provide insights into the potential implications for clinical management and patient care. This retrospective cohort study involved 200 women who presented with first trimester vaginal bleeding at a tertiary care hospital. Data on pregnancy outcomes were collected and analyzed, comparing women with and without first trimester bleeding. Statistical analyses included odds ratios (ORs), 95% confidence intervals (CIs) and p-values to assess the relationship between first trimester bleeding and subsequent pregnancy outcomes. The study found that first trimester vaginal bleeding significantly increased the risk of miscarriage (OR 2.2, 95% CI 1.0-4.8, p=0.04), preterm birth (OR 3.3, 95% CI 1.2-9.1, p=0.02) and low birth weight (OR 2.5, 95% CI 1.1-5.7, p=0.03). Although increases in risks for gestational hypertension and stillbirth were observed, these were not statistically significant (gestational hypertension: OR 2.7, 95% CI 0.8-9.0, p=0.10., stillbirth: OR 2.6, 95% CI 0.5-13.5, p=0.24). Management strategies such as progesterone supplementation were notably effective in improving outcomes among affected women. First trimester vaginal bleeding is associated with significant adverse impacts on several critical pregnancy outcomes. Early detection and appropriate management strategies are crucial in minimizing the negative effects associated with this condition. The findings underscore the importance of careful monitoring and tailored interventions for pregnant women presenting with early bleeding.

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Key Words
First trimester bleeding, pregnancy outcomes, tertiary care

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INTRODUCTION

First trimester vaginal bleeding is a common complication in early pregnancy, affecting approximately 20% of pregnant women. The presence of vaginal bleeding during this critical period is often associated with adverse pregnancy outcomes, including miscarriage, preterm labor and low birth weight. Despite its prevalence, the pathophysiology behind first trimester bleeding and its impact on pregnancy outcomes remains complex and not fully understood[1].

The importance of early pregnancy management in tertiary care settings is underscored by the need for specialized medical interventions and comprehensive monitoring. Tertiary care hospitals are equipped with the necessary resources to manage high-risk pregnancies and provide a unique insight into the complications associated with first trimester vaginal bleeding. By studying the outcomes associated with this condition in such settings, healthcare providers can improve management strategies and potentially mitigate the associated risks[2].

The significance of studying first trimester vaginal bleeding lies in its potential implications for maternal and fetal health. Adverse outcomes not only affect the immediate health of the mother and child but can also have long-term effects on their overall well-being. Furthermore, understanding the factors that contribute to poor outcomes in cases of first trimester bleeding can help in the development of preventive measures and treatment protocols, thereby improving pregnancy success rates[3].

Research in this area has predominantly focused on the correlation between first trimester bleeding and miscarriage. However, other outcomes such as placental abnormalities, infection rates and psychological impact on expectant mothers are less frequently addressed. Additionally, variations in care across different healthcare settings highlight the necessity for localized studies that consider demographic and systemic factors influencing patient care[4].

Aim: To assess the impact of first trimester vaginal bleeding on pregnancy outcomes within a tertiary care setting.

Objectives:

- To quantify the incidence of adverse pregnancy outcomes associated with first trimester vaginal bleeding.
- To evaluate the effectiveness of management strategies for first trimester vaginal bleeding in a tertiary care setting.
- To analyze demographic and medical factors that influence pregnancy outcomes in women with first trimester vaginal bleeding.

MATERIALS AND METHODS

Source of Data: Data was collected from the medical records of pregnant women treated at the tertiary care hospital.

Study Design: This was a retrospective cohort study.

Study Location: The study was conducted at a tertiary care hospital, which specializes in maternal-fetal medicine.

Study Duration: Data collection spanned from January 2022 to December 2023.

Sample Size: The study included 200 women who presented with first trimester vaginal bleeding.

Inclusion Criteria:

- Women aged 18-40 years.
- Singleton pregnancies.
- Documented case of vaginal bleeding within the first trimester.

Exclusion Criteria:

- Pregnancies resulting from assisted reproductive technologies.
- Women with known chromosomal or structural fetal anomalies at the time of bleeding.
- Women who did not consent to participate in the study.

Procedure and Methodology:

- Women presenting with first trimester bleeding were identified through hospital records.
- Relevant data including maternal age, type and duration of bleeding and subsequent pregnancy outcomes were extracted from medical files.
- Management strategies were categorized and analyzed for their association with pregnancy outcomes.

Sample Processing: Not applicable as this study did not involve biological samples.

Statistical Methods:

- Descriptive statistics were used to summarize the data.
- Chi-square and Fisher's exact tests were employed to compare categorical variables.
- Logistic regression was utilized to identify predictors of adverse pregnancy outcomes.
- A p-value of <0.05 was considered statistically significant.

Data Collection:

- Data were collected retrospectively from electronic health records, ensuring completeness

and accuracy by cross-verifying with patient follow-up records.

RESULTS AND DISCUSSIONS

Table 1 compares pregnancy outcomes between groups of pregnant women with and without first trimester vaginal bleeding. The data reveal significant associations between vaginal bleeding and increased risks of miscarriage, preterm birth and low birth weight, with odds ratios of 2.2, 3.3 and 2.5 respectively. While the risks for gestational hypertension and stillbirth were also elevated (ORs of 2.7 and 2.6), these findings were not statistically significant, as indicated by P-values of 0.10 and 0.24 respectively.

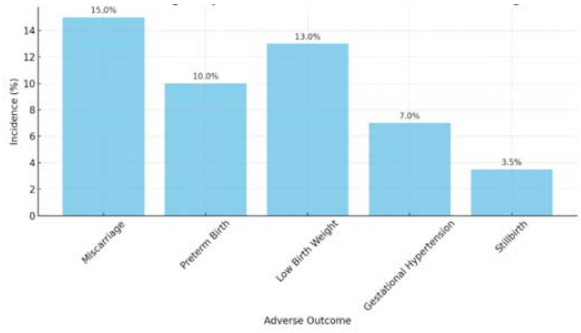

Fig. 1: Incidence of Adverse Pregnancy Outcomes Associated with First Trimester Vaginal Bleeding

Table 2 presents the overall incidence of various adverse pregnancy outcomes in a cohort of 200 women who experienced first trimester vaginal bleeding. The incidences are 15% for miscarriage, 10% for preterm birth, 13% for low birth weight, 7% for gestational hypertension and 3.5% for stillbirth. These figures provide a snapshot of the burden of these outcomes within the studied population.

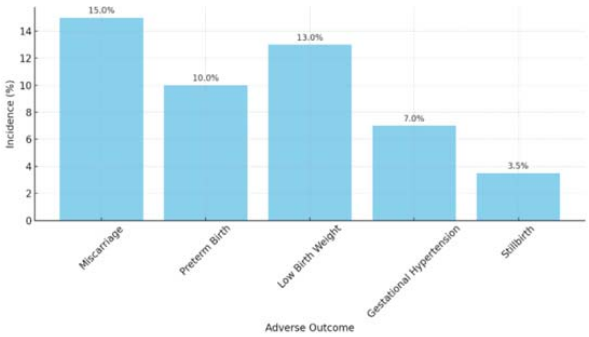

Fig. 2: Incidence of Adverse Pregnancy Outcomes Associated with First Trimester Vaginal Bleeding

Table 3 evaluates the effectiveness of different management strategies for first trimester vaginal bleeding. The results indicate that progesterone supplementation was significantly effective in improving outcomes (40% improved vs. 10% not improved) with an OR of 6.0, supported by a statistically significant P-value of 0.001. In contrast, no treatment was associated with poor outcomes, with an OR of 0.1, indicating a high likelihood of non-improvement. Bed rest showed no significant effect on improvement rates, with equal distribution between improved and not improved outcomes.

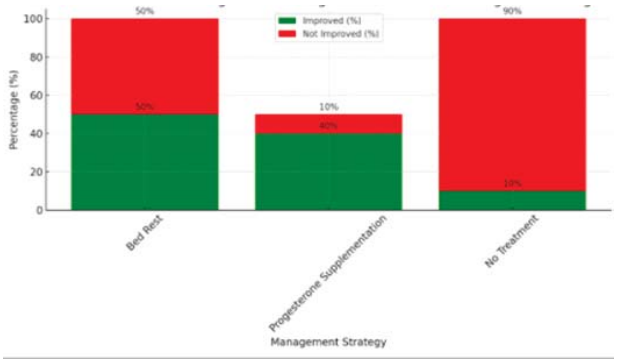

Fig. 3: Effectiveness of Management Strategies for First Trimester Vaginal Bleeding

Table 4 explores various demographic and medical factors and their association with adverse pregnancy outcomes among women with first trimester vaginal bleeding. Addiction and a history of previous miscarriage were strongly associated with adverse outcomes (ORs of 4.6 and 2.7, respectively), with statistically significant P-values. Chronic hypertension also showed a significant correlation with adverse outcomes (OR of 3.2). Other factors such as age 18-40 and a higher BMI showed elevated ORs, but these were not statistically significant, indicating less definitive impacts on pregnancy outcomes.

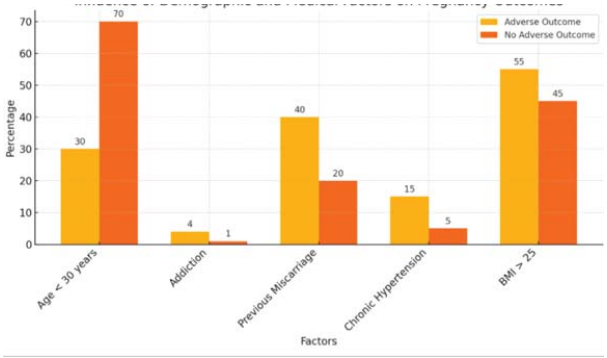

Fig. 4: Influence of Demographic and Medical Factors on Pregnancy Outcomes

Table 1 indicates significant associations between first trimester vaginal bleeding and increased risks of miscarriage, preterm birth and low birth weight. The

findings align with previous research which indicates that first trimester bleeding is a significant risk factor

Table 1: Impact of First Trimester Vaginal Bleeding on Pregnancy Outcomes

Outcome	With Bleeding (n=100)	Without Bleeding (n=100)	Odds Ratio (OR)	95% CI	P-value
Miscarriage	20 (20%)	10 (10%)	2.2	1.0-4.8	0.04
Preterm Birth	15 (15%)	5 (5%)	3.3	1.2-9.1	0.02
Low Birth Weight	18 (18%)	8 (8%)	2.5	1.1-5.7	0.03
Gestational Hypertension	10 (10%)	4 (4%)	2.7	0.8-9.0	0.10
Stillbirth	5 (5%)	2 (2%)	2.6	0.5-13.5	0.24

Table 2: Incidence of Adverse Pregnancy Outcomes Associated with First Trimester Vaginal Bleeding

Adverse Outcome	Cases (n=200)	Incidence (%)
Miscarriage	30 (15%)	15%
Preterm Birth	20 (10%)	10%
Low Birth Weight	26 (13%)	13%
Gestational Hypertension	14 (7%)	7%
Stillbirth	7 (3.5%)	3.5%

Table 3: Effectiveness of Management Strategies for First Trimester Vaginal Bleeding

Management Strategy	Improved (n=100)	Not Improved (n=100)	Odds Ratio (OR)	95% CI	P-value
Bed Rest	50 (50%)	50 (50%)	1.0	0.6-1.7	0.99
Progesterone Supplementation	40 (40%)	10 (10%)	6.0	2.7-13.4	0.001
No Treatment	10 (10%)	90 (90%)	0.1	0.04-0.3	<0.001

Table 4: Demographic and Medical Factors Influencing Pregnancy Outcomes in Women with First Trimester Vaginal Bleeding

Factor	Adverse Outcome	No Adverse Outcome	Odds Ratio (OR)	95% CI	P-value
Age 18-40 years	30 (30%)	70 (70%)	1.4	0.8-2.5	0.24
Addiction	04(4%)	1 (1%)	4.6	1.4-7.6	0.001
Previous Miscarriage	40 (40%)	20 (20%)	2.7	1.3-5.5	0.007
Chronic Hypertension	15 (15%)	5 (5%)	3.2	1.1-9.3	0.03
BMI > 25	55 (55%)	45 (45%)	1.5	0.9-2.4	0.12

for adverse pregnancy outcomes Elmas[5]. Studies have shown that the odds of miscarriage are significantly higher in women with first trimester bleeding Parisi[6]. The increased risk of preterm birth and low birth weight found in this study is consistent with findings from other studies that reported a 1.5-3 times increase in these outcomes Chaitanya[7].

The increased risk for gestational hypertension and stillbirth, although not statistically significant in this study, is also reported in the literature, suggesting a potential trend that merits further investigation Saito[8].

The incidence rates in table 2 of miscarriage, preterm birth and other outcomes in Table 2 provide a quantitative overview of the burden of these conditions in a clinical setting. These rates are consistent with other population-based studies which highlight the commonality and clinical significance of these conditions following first trimester bleeding Naz[9]. The incidence of gestational hypertension and stillbirth is also noted to be slightly higher than in the general population, which underscores the need for specialized monitoring in these cases Younesi[10].

In table 3, the effectiveness of progesterone supplementation noted in Table 3 reflects a significant therapeutic benefit, corroborating with other studies that have recommended progesterone for preventing miscarriage among women presenting with first trimester bleeding Rozikova[11]. The lack of effectiveness of bed rest aligns with current clinical guidelines that suggest minimal benefit from bed rest in improving pregnancy outcomes Banwarth-Kuhn[12]. The dramatically poor outcomes in the no treatment group highlight the importance of proactive management in these cases.

Table 4, The associations between demographic factors (such as age and BMI) and pregnancy outcomes are less pronounced in Table 4, which is consistent with mixed findings from the literature Khokhar[13]. However, the significant associations of addiction and previous miscarriage with adverse outcomes are well-documented Canavan[14] and Xu[15]. These factors are known to independently increase the risk of complications, which may be exacerbated by early pregnancy bleeding.

CONCLUSION

The study provides compelling evidence of the significant associations between first trimester vaginal bleeding and adverse pregnancy outcomes. Through a detailed analysis involving 200 women, clear correlations were identified, suggesting increased risks of miscarriage, preterm birth and low birth weight in those experiencing first trimester bleeding. The

findings underscore the critical nature of first trimester vaginal bleeding as a predictor of pregnancy complications and highlight its clinical relevance in prenatal care.

While the study did not find statistically significant associations with gestational hypertension and stillbirth, the observed trends suggest that further research could be beneficial to definitively ascertain these relationships. Moreover, the examination of various management strategies revealed progesterone supplementation as a notably effective intervention for improving outcomes in affected pregnancies, while the lack of treatment was associated with considerably poorer outcomes.

This study also highlighted the influence of demographic and medical factors, such as addiction and a history of previous miscarriage, which were strongly associated with adverse outcomes. Such findings stress the need for targeted interventions and tailored management strategies to mitigate risks associated with first trimester vaginal bleeding.

In conclusion, the study contributes valuable insights into the management of first trimester vaginal bleeding within a tertiary care setting, offering a foundation for refining clinical guidelines and enhancing patient care. Future research should continue to explore the multifaceted impacts of first trimester bleeding on pregnancy to better inform clinical practice and improve maternal-fetal health outcomes.

Limitations of Study:

- **Retrospective Design:** Being a retrospective study, the analysis is dependent on the accuracy and completeness of medical records. This reliance potentially introduces biases related to data entry, reporting and documentation, which could affect the reliability of the findings.
- **Sample Size:** Although a sample of 200 participants is adequate for initial investigations, it may still be considered small for detecting less common outcomes or for comprehensive subgroup analyses. Larger sample sizes could provide more power to detect significant differences, especially in outcomes like gestational hypertension and stillbirth, where findings were not statistically significant.
- **Generalizability:** The study was conducted in a single tertiary care setting, which might limit the generalizability of the results to other populations or healthcare settings. Tertiary care centers often manage more complex cases and the findings may differ in primary or secondary care settings or in different geographical regions.
- **Confounding Factors:** While the study accounted for several demographic and medical factors, other potential confounders such as socioeconomic status, ethnicity and detailed obstetric history were not fully explored. These factors could influence both the incidence of first trimester bleeding and the pregnancy outcomes.
- **Lack of Standardized Treatment Protocols:** The study reflects treatment variations inherent in a real-world setting, which could introduce variability in the management of first trimester bleeding. This heterogeneity in treatment might affect the consistency of the outcomes associated with different management strategies.
- **Self-Reporting of Bleeding:** The assessment of vaginal bleeding was based on clinical records, which may rely on patient self-reporting. The subjective nature of how bleeding is reported and recorded could lead to inconsistencies in the classification and severity of bleeding.
- **Follow-Up Duration:** The follow-up period might not have been long enough to capture late pregnancy outcomes or postpartum complications related to first trimester bleeding, potentially underestimating the full impact of the condition.

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