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Original Research Article

Maternal and perinatal outcomes in pregnant women with subchorionic hemorrhage: A prospective observational study

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Abstract
Background: Subchorionic hemorrhage is the most common intrauterine hematoma detected on ultrasonography in early pregnancy and is frequently associated with first- and second-trimester vaginal bleeding. Although SCH has been linked to adverse pregnancy outcomes such as miscarriage, preterm delivery, and neonatal complications, existing literature shows conflicting results regarding its true clinical significance. This uncertainty necessitates further prospective evaluations to better understand the maternal and perinatal outcomes associated with SCH and to guide appropriate antenatal counselling and management.
Methods: A prospective observational study was conducted over one year (May 2023–May 2024) at the Department of Obstetrics and Gynaecology, Government Medical College, Thrissur. A total of 157 pregnant women with singleton pregnancies and ultrasonographically confirmed subchorionic haemorrhage was included after excluding multiple gestations, molar pregnancies, bleeding disorders, uterine anomalies, ART pregnancies, and those with prior adverse obstetric history. SCH was classified based on size relative to the gestational sac into small (<20%), medium (20–50%), and large (>50%). Participants were followed throughout pregnancy to assess maternal outcomes (abortion, preterm delivery and term delivery) and perinatal outcomes (birth weight, APGAR score, NICU admission, and neonatal death). Data were analyzed using SPSS, with statistical significance set at $p<0.05$.
Results: Most cases (76.4%) were diagnosed in the first trimester, commonly between 8 and 13 weeks of gestation. SCH was incidentally detected in 58.6% of patients, while 32.4% presented with vaginal bleeding. Term delivery occurred in 68.2% of cases, preterm delivery in 15.2%, and abortion in 16.5%. No significant association was observed between SCH and overall adverse maternal or perinatal outcomes. However, vaginal bleeding and larger hematoma size showed a statistically significant association with increased abortion rates.
Conclusion: Subchorionic haemorrhage, particularly when detected incidentally and of small size, does not significantly increase adverse maternal or perinatal outcomes. However, the presence of vaginal bleeding and large hematomas is associated with a higher risk of pregnancy loss. Larger multicentric studies are recommended to further clarify these associations.

Keywords: Subchorionic haemorrhage, pregnancy outcome, miscarriage, ultrasonography, perinatal outcome

Introduction
Robert Browning's quote, *"All love begins and ends there,"* aptly reflects the profound emotional significance of motherhood. Pregnancy is typically a period marked by joy, anticipation, and emotional bonding; however, these positive emotions can rapidly transform into anxiety and fear when complications such as vaginal bleeding occur. Bleeding per vaginum is one of the most distressing symptoms encountered during pregnancy and is a common cause of maternal concern. Approximately 50% of pregnancies complicated by first-trimester bleeding result in miscarriage before 20 weeks of gestation. Even when the pregnancy continues, women who experience early pregnancy bleeding are at an increased risk of adverse obstetric outcomes later in gestation.
Intrauterine hematomas are frequently identified in women presenting with clinically evident bleeding during early pregnancy. Based on their anatomical location, these hematomas are classified into three types: subchorionic, preplacental, and retroplacental hematomas [1].

SCH (Subchorionic Hemorrhage) refers to bleeding occurring beneath the chorionic membrane that surrounds the embryo. Although the precise etiology remains unclear, SCH is believed to result from partial detachment of the chorionic membranes from the uterine wall. Retroplacental hematomas occur between the placenta and myometrium, whereas preplacental hematomas are located between the placenta and the amniotic fluid or placental membranes, accounting for approximately 16% and 4% of cases, respectively.

Subchorionic haemorrhage is the most common type of intrauterine hematoma, accounting for nearly 81% of cases, particularly in pregnancies between 10 and 20 weeks of gestation. While some women present with vaginal bleeding or mild abdominal discomfort, many remain asymptomatic, with SCH being detected incidentally during routine ultrasonographic evaluation [2]. On ultrasound, SCH typically appears as a crescent-shaped echo-free area adjacent to the gestational sac in the first trimester and as an elongated echo-free space between the uterine wall and fetal membranes beyond 13 weeks of gestation.

Given its frequency and potential implications, subchorionic hematoma has attracted significant attention in obstetric research. Understanding its association with maternal and perinatal outcomes-ranging from miscarriage and placental abruption to preterm labour, birth weight variations, and neonatal morbidity-is essential for effective prenatal counselling, risk stratification, and management.

Aims and Objectives

The study aimed to evaluate the impact of ultrasonographically detected subchorionic hemorrhage on maternal and perinatal outcomes in pregnant women. Specifically, the study seeks to assess pregnancy outcomes such as miscarriage, preterm delivery, term delivery, and neonatal health parameters, while also identifying associated factors-including gestational age at diagnosis, clinical presentation, and hematoma characteristics-that may influence these outcomes.

Materials and Methods

Study Design

This prospective observational study was conducted in the Department of Obstetrics and Gynaecology at Government Medical College, Thrissur, Kerala, India. The study included pregnant women aged 19–35 years with ultrasonographically detected subchorionic haemorrhage who attended the antenatal clinic or obstetrics and gynaecology casualty services of the institution. All eligible participants were enrolled and followed up prospectively to assess maternal and perinatal outcomes. The study was carried out over a one-year period from May 2023 to May 2024.

Inclusion and Exclusion Criteria

The study included pregnant women with a live intrauterine foetus in whom subchorionic hematoma was identified on ultrasonography, irrespective of the presence or absence of vaginal bleeding. Women with multiple gestations, partial or complete molar pregnancy, known bleeding disorders, congenital uterine anomalies, those who conceived through assisted reproductive techniques, and patients with a previous history of preterm labour or recurrent miscarriage were excluded from the study to eliminate confounding factors that could independently influence maternal and perinatal outcomes.

Sample Size Calculation

Sample size was calculated the formula:

$$N = \frac{3.84x\ PQ}{d\ x\ d}$$

P = 37.9%, prevalence of miscarriage according to the study conducted by Shafaq Hanif in 2019.

Q=100-P =100-37.9

= 62.1

d =20% of P

Sample size

$$n = \frac{3.84x\ 0.05x0.95}{7.58*7.58}$$

= 157

Data Collection Procedure

This prospective study was conducted over a one-year period at Government Medical College, Thrissur. Initially, 173 pregnant women with ultra-sonographically detected subchorionic hematoma were enrolled, of whom 16 were lost to follow-up, resulting in a final study population of 157 participants. After obtaining informed consent, eligible women with singleton pregnancies were recruited from antenatal clinics, obstetric wards, labour rooms, and casualty services, irrespective of gestational age or presenting symptoms. Detailed socio-demographic information and obstetric history, including age, parity, gestational age calculated from the last menstrual period, presence and characteristics of vaginal bleeding, and relevant medical and surgical history, were recorded using a structured proforma. Clinical and systemic examinations were performed, and ultrasonography-transabdominal, transvaginal, or both-was used to confirm and assess subchorionic hematoma, which was classified based on its size relative to the gestational sac as small (<20%), medium (20–50%), or large (>50%). Participants were grouped according to age, trimester, gestational age at diagnosis, and hematoma size, and were followed throughout pregnancy to document maternal outcomes such as miscarriage, placental abruption, preterm delivery (<37 weeks), term delivery (≥37 weeks), and mode of delivery. For pregnancies resulting in live births, perinatal outcomes including birth weight, intrauterine growth restriction, APGAR scores, NICU admission, and neonatal death were recorded and analyzed.

Statistical Analysis

Data collected from the study participants were coded and entered into Microsoft Excel and subsequently analyzed using SPSS (Statistical Package for the Social Sciences) software. Results were expressed as numbers and percentages. Categorical variables were analyzed using the chi-square test to determine associations between variables. A p-value of less than 0.05 was considered statistically significant.

Results

Table 1: Distribution of Patients According to Trimester

Trimester	Number (n=157)	Percentage
First trimester	120	76.4%
Second trimester	37	23.6%
Total	157	100%

Table 1 illustrates that the majority of SCH were detected in the first trimester, indicating that SCH is predominantly an early pregnancy finding.

Table 2: Age Distribution of Study Participants

Age Group (in years)	Number	Percentage	P value
20–24	61	38.9%	0.00*
25–29	54	34.4%	
30–34	37	23.5%	
≥35	5	3.2%	
Total	157	100%	

Table 2 shows that most women belonged to the 20–29 year-old age group, reflecting that SCH is commonly observed during peak reproductive age.

Table 3: Distribution According to Obstetric Score

Gravida	Number	Percentage	P value
Primigravida	101	64.4%	0.45
Gravida 2	48	30.6%	
Gravida ≥3	8	5.0%	
Total	157	100%	

Table 3 demonstrates that subchorionic hematoma was more frequently observed among primigravida women compared to multigravida women.

Table 4: Gestational Age at Detection of SCH

Gestational Age	Number	Percentage	P value
<8 weeks	38	24.2%	0.00*
8–13 weeks	74	47.1%	
13–17 weeks	22	14.0%	
>17 weeks	23	14.7%	
Total	157	100%	

Table 4 indicates that nearly half of SCH cases were diagnosed between 8 and 13 weeks of gestation, highlighting the vulnerability of early placentation.

Table 5: Clinical Presentation of SCH

Presentation	Number	Percentage
Incidental detection	92	58.6%
Vaginal bleeding	51	32.4%
Abdominal pain	14	9.0%
Total	157	100%

Table 5 shows that most SCH cases were asymptomatic and detected incidentally on ultrasound, while vaginal bleeding was the most common symptom among symptomatic patients.

Table 6: Pregnancy Outcome

Outcome	Number	Percentage	P value
Term delivery	107	68.2%	0.10
Preterm delivery	24	15.2%	
Abortion	26	16.6%	
Total	157	100%	

Table 6 reveals that the majority of women with SCH had favourable pregnancy outcomes, with more than two-thirds delivering at term.

Table 7: Outcome According to Size of Subchorionic Hematoma

Size of SCH	Abortion	Continued Pregnancy	P value
Small (<20%)	1	77	0.001
Medium (20–50%)	3	51	
Large (>50%)	22	3	

Table 7 clearly demonstrates that larger subchorionic hematomas are significantly associated with higher rates of abortion, emphasizing hematoma size as an important prognostic factor.

Discussion

This prospective observational study evaluated maternal and perinatal outcomes in 157 pregnant women diagnosed with SCH and aimed to identify factors influencing pregnancy outcomes. Parameters such as maternal age, parity, gestational age at diagnosis, clinical presentation, hematoma size, and neonatal outcomes were analyzed and compared with existing literature.

In the present study, the majority of women were primigravida (64.4%), and most belonged to the reproductive age group of 20–29 years, with both age and parity showing a statistically significant association with SCH ($p < 0.05$). Similar findings were reported by Haixia Huang *et al.*, who observed a higher incidence of SCH among primigravida women. However, Sukur *et al.* did not find a significant association between SCH and maternal age or parity, highlighting variability across populations [3].

Most cases of SCH in this study were detected during the first trimester (76.4%), particularly between 8 and 13 weeks of gestation. This observation is consistent with studies by Shayesta Rahi and Masarat Rashid, who reported that over 70% of SCH cases were diagnosed before 12 weeks of gestation [4]. Gupta *et al.* also documented a similar predominance of early gestational diagnosis, supporting the findings of the present study [5].

Regarding clinical presentation, more than half of the cases (58.6%) were incidentally detected on ultrasonography, while 32.4% presented with vaginal bleeding. This indicates that a substantial proportion of SCH cases may remain asymptomatic. Seki *et al.* observed that vaginal bleeding was the most common presenting symptom, with peak occurrence between 9 and 11 weeks, which aligns with the bleeding pattern noted in this study [6].

Analysis of pregnancy outcomes revealed that 68.2% of women delivered at term, 15.2% had preterm deliveries, and 16.5% experienced abortions. No statistically significant association was found between SCH and overall adverse pregnancy outcomes. These findings are consistent with the observations of Jianjun Zhou *et al.*, who reported no significant increase in miscarriage rates among women with SCH [7]. In contrast, a meta-analysis by Tuuli Methodius *et al.* demonstrated an increased risk of miscarriage and preterm delivery in patients with SCH, which differs from the current study [8]. Ayser Hashem *et al.* also reported a higher incidence of adverse outcomes such as miscarriage and placental abruption [9].

Most abortions in the present study occurred during early gestation, particularly between 8 and 13 weeks. However, no significant association was observed between gestational age at diagnosis and pregnancy outcome, a finding supported by Benavides-Reyes *et al.* [10] Notably, vaginal bleeding was significantly associated with miscarriage ($p < 0.05$), consistent with observations by Bennett *et al.*, who reported higher adverse outcomes in SCH cases accompanied by bleeding [11].

Hematoma size emerged as a significant prognostic factor in this study. Large SCHs were strongly associated with increased abortion rates ($p<0.05$), with more than 80% of large hematomas resulting in pregnancy loss. Similar conclusions were drawn by Benavides-Reyes *et al.* and Leite *et al*., emphasizing the importance of hematoma volume in predicting outcomes [10, 12]. Conversely, Bloch *et al.* found no correlation between hematoma size and pregnancy outcome, indicating ongoing controversy [13].

Mode of delivery and neonatal outcomes such as birth weight, IUGR, NICU admission, and neonatal death showed no significant association with SCH in the present study. These findings are consistent with Al-Memar *et al.* [14] although Gupta *et al*. reported higher NICU admission rates in SCH-affected pregnancies [5].

The findings suggest that while subchorionic hematoma itself may not significantly worsen maternal or perinatal outcomes, associated factors such as vaginal bleeding and larger hematoma size play a crucial role in determining prognosis.

Limitations

The present study has certain limitations that should be acknowledged. The sample size was relatively small, which may limit the generalizability of the findings; therefore, studies with larger sample sizes are recommended to provide more robust conclusions. The effect of the anatomical location of the subchorionic hematoma was not evaluated, which may influence pregnancy outcomes. Additionally, due to the irregular shape of subchorionic hematomas, accurate measurement of hematoma size may have been challenging, potentially affecting the precision of size-based outcome analysis.

Conclusion

This study demonstrates that subchorionic hematoma is most commonly detected incidentally in early pregnancy, particularly among primigravida women aged 20–29 years. Overall, no significant association was found between SCH and adverse maternal or perinatal outcomes; however, the presence of vaginal bleeding and larger hematoma size were significantly associated with an increased risk of abortion. These findings highlight the importance of careful monitoring in symptomatic cases and those with large hematomas, while emphasizing the need for larger studies to further clarify the impact of subchorionic hematoma on pregnancy outcomes. The findings are intended to enhance understanding of the clinical significance of subchorionic haemorrhage and contribute to improved prenatal counselling and management strategies.

Conflict of Interest

Not available

Financial Support

Not available

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