International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2019): 7.583

# Outcome of First Trimester Threatened Miscarriage With or Without Subchorionic Hematoma

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**Abstract:** ***Background: Vaginal bleeding is a common problem in the first trimester, vaginal bleeding in the presence of a closed cervix and ultrasonographic visualization of an intrauterine pregnancy with positive fetal cardiac activity is diagnostic of threatened miscarriage. In patients with threatened miscarriage, vaginal bleeding does not always result in pregnancy loss. The bleeding may be a result of disrupted decidual vessels due to a separation at the subchorionic area. Objective: To study the significance of abdominal ultrasound subchorionic hematoma finding on the first trimester threatened miscarriage outcome. Patients and Methods: This prospective cohort study was conducted on 144 pregnant ladies; 75women had Subchorionic hematoma (study group) matching with 69 women without Subchorionic hematoma (control group). The demographic feature, placental site, size of hematoma and pregnancy outcomes were analyzed. Results: Analysis of data show that there is statistically significant difference between both groups regarding maternal age, gestational age, BMI, size of hematoma and pregnancy outcome. Also the study show that there is no statistically significant difference regarding parity and placental site. Conclusion: Subchorionic hematoma in the first trimester of the pregnancy increases the risk of spontaneous miscarriage. The risk increases with increasing maternal age, BMI, earlier gestational age (less than 9 weeks) and hematoma size. Parity and placental site do not significantly increase the risk of miscarriage.***

**Keywords:** threatened miscarriage, subchorionic hematoma, Vaginal bleeding, maternal age, gestational age

## 1. Introduction

Miscarriage is the spontaneous or induced termination of pregnancy before fetal viability[1]. Because popular use of the word abortion implies a deliberate pregnancy termination some prefer the word miscarriage to refer to spontaneous fetal loss before viability[2].

## 2. Patients and Methods

This prospective cohort study was conducted on a randomly selected 150 pregnant women presented at antenatal care out-patient clinic in Al-Elwiya Maternity Teaching Hospital/ Baghdad during the period from May 1, 2015 to January 1,2016. ". The study protocol was approved by the scientific committee of the Iraqi Board for Medical Specializations and the Department of Obstetrics and Gynecology in Al-Elwiya Maternity Teaching Hospital and their ethical committee. The study sample was divided in two groups, 75 cases presented with threatened miscarriage and subchorionic hematoma "representing the cohort exposed group" and the same number from those were cases of threatened miscarriage without any US evidence of subchorionic hematoma "representing the control non exposed group.

**Inclusion criteria:**
All multiparous lady(P1 - P4) with a previous normal vaginal deliveries of a known regular last menstrual period (LMP) and they were in their first trimester of pregnancy; presented as threatened miscarriage with subchorionic hematomas categorized as the "cohorts" or were not having subchorionic hematoma "controls" with a viable, singleton, intrauterine gestation between 6 and 12weeks.

**Exclusion criteria**

- Patients with a nonviable or non-visible embryos.
- Primigravida, grandmultiparity, or multiple pregnancies.
- Gross fetal abnormality diagnosed by ultra-sonography.
- Those with pathological features, including fibroids, uterine polyps, uterine malformations and those who underwent elective termination of pregnancy.
- Those with history of recurrent miscarriage.
- Those with history of medical diseases like chronic hypertension, diabetes mellitus, or all causes of anemia.
- Patient with retro placental and sub amniotic hematoma with threatened miscarriage confirmed by ultra sound
- Those on anti-coagulant therapy e.g. low molecular weight heparin.
- Those with previous caesarean section.

## 3. Data Collection

The verbal consent were obtained from patients before their participation in our study. First group was 75 pregnant with subchorionic hematoma (cohort exposed) and second group was 75 pregnant without hematoma (control non-exposed), out of all patients, 6 were excluded (from control group) because they were dropped out from follow up. Baseline data were recorded by well-designed questionnaire form and the patients were interviewed with review of medical, surgical and drug history, measurement of the patient vital signs was done, as well as pregnancy was confirmed by pregnancy test (serum Beta hCG) and abdominal ultrasonic Fetal heart activity was ultrasonically confirmed. The size of the gestational sac was recorded in all cases. The size of the hematoma examination and the diagnosis of threatened miscarriage was made by history and review of the symptoms of threatened miscarriage who presented with vaginal bleeding or bloody vaginal discharge, with or

without abdominal cramps, then the patient send for blood group and Rh ,complete blood picture and oral glucose tolerance test.

Gestational age was calculated, on the basis of the last menstrual period according to Neagle`s rule and confirmed by ultrasonographic measurement by evaluation of crown rump length. (which appears on ultrasound as a hypoechoic crescent adjacent to gestational sac) was then compared with the size of the gestational sac during the ultrasound examination and classified as, small (<20% of the gestational sac), medium (20%–49% of the gestational sac), or large (=>50% of the gestational sac). Maternal age, maternal body mass index, parity, Gestational age at the diagnosis of the hematoma, location of placenta (marked as ant. or post.), and pregnancy outcome at 24completed weeks (aborted or continued) were noted. The same criteria of the study group were applied for the control group, except for the presence of hematomas. Serial scans (between 2days – 7days interval) were performed, only the first examination and last one at 24 completed week were considered for the analysis.

The ultrasound examination for those patients who participated in the study was done in antenatal care out-patient clinic in Al-Elwiya Maternity Teaching Hospital /Baghdad by the help of specialist sonographist. Ultrasonographic examinations were performed trans-abdominally (by transverse and longitudinal scanning) with curvi linear probe (3-5MHZ) and an ultrasound device (Siemens acuson x300).

**Statistical analysis**

Analysis of data was carried out using the available statistical package of SPSS-22 (Statistical Packages for Social Sciences- version 22).

Data were presented in simple measures of frequency, percentage, mean, standard deviation, and range (minimum-maximum values).

The significance of difference of different means (quantitative data) were tested using Students-t-test for difference between two independent. The significance of difference of different percentages (qualitative data) were tested using Pearson Chi-square test ($\chi^2$-test) with application of Yate's correction or Fisher Exact test whenever applicable. Statistical significance was considered whenever the P value was equal or less than 0.05.

## 4. Results

In this study; 144 cases of threatened miscarriages were included according to the inclusion criteria, 75 patients with subchorionic hematomas (group 1) and 69 cases without hematoma (group 2).

Table 1 shows the average age of pregnant ladies who presented with subchorionic hematoma is significantly older (31.17 ± 2.785) than those without a hematoma (23.50 ± 3.241), p<0.05, similarly the body mass index of the first group is significantly more than those of the second group , (31.50 ± 1.738) vs. (28.75 ± 1.710) , p value <0.05.

Table 1 also shows that there is a statistically significant difference in the gestational age of presentation in the subchorionic hematoma group (8.07 ± 1.07 weeks) versus (11.09 ± 0.8 weeks) in the no hematoma group with a p value <0.05.

The parity distribution of patients with subchorionic hematoma versus those without a hematoma is also shown in Table 1. There is no statistically significant difference in parity between the two groups. Para 1 to 2 was 62.7% in the subchorionic hematoma group versus 50.7% in the no hematoma group , and Para 3 to 4 was 37.3 % in the subchorionic hematoma group versus 49.3 % in the no hematoma group, with a p value >0.05 .

**Table 1:** Maternal age, body mass index, gestational age and parity for cases presented with threatened miscarriage with subchorionic hematoma versus no hematoma.

| *Maternal Characteristics* | | | *No Hematoma n=69* | | *Subchorionic Hematoma n=75* | *p value* |
|---|---|---|---|---|---|---|
| | | | Mean ± SD | | Mean ± SD | |
| Age (years) | | | 23.50 ± 3.241 | | 31.17 ± 2.785 | < 0.05* |
| BMI (kg/m$^2$) | | | 28.75 ± 1.710 | | 31.50 ± 1.738 | < 0.05* |
| GA (weeks) | | | 11.09 ± 0.8 | | 8.07 ± 1.07 | < 0.05* |
| | | n | % | n | % | |
| Parity | 1-2 | 35 | 50.7 | 47 | 62.7 | 0.148 |
| | 3-4 | 34 | 49.3 | 28 | 37.3 | |
| Total | | 69 | 100% | 75 | 100% | |

*Significant difference using Students-t-test for two independent means at 0.05 level.

Table 2 shows that there is no statistically significant difference in the placental site between the two groups, the placenta was anterior in 52% of the subchorionic hematoma group versus 63.8% in the no hematoma group, and it was posterior in 48% in the subchorionic hematoma group versus 36.2% in the no hematoma group with a p = 0.153 .

**Table 2:** Placental site in cases with subchorionic hematoma versus no hematoma

| *Placental Site* | *No Hematoma* | | *Subchorionic Hematoma* | | *p value* |
|---|---|---|---|---|---|
| | n | % | n | % | |
| Anterior | 44 | 63.8% | 39 | 52.0% | 0.153 |
| Posterior | 25 | 36.2% | 36 | 48.0% | |
| Total | 69 | 100% | 75 | 100% | |

*Significant difference between proportions using Pearson Chi-square test at 0.05 level.

Table 3 shows that there is a statistically significant association between the hematoma size and miscarriage. 5.3% of cases with small subchorionic hematoma (less than 20% gestational sac size) underwent miscarriage versus 76.8% continued beyond the 24 weeks. 26.3% of cases with medium sized subchorionic hematoma (20 – 49% gestational sac size) underwent miscarriage versus 14.3. And 68.4% of large subchorionic hematoma cases (greater than or equal to 50% gestational sac size) underwent miscarriage versus 8.9%, with a p <0.05.

**Table 3:** The association between the hematoma size and the outcome

| *Hematoma Size* | *Miscarriage* | | *No miscarriage* | | *Total* | | *P value* |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | |
| Small | 1 | 5.3% | 43 | 76.8% | 44 | 58.7% | <0.05* |
| Medium | 5 | 26.3% | 8 | 14.3% | 13 | 17.3% | |
| Large | 13 | 68.4% | 5 | 8.9% | 18 | 24% | |
| Total | 19 | 100% | 56 | 100% | 75 | 100% | |

*Significant difference between proportions using Pearson Chi-square test at 0.05 level.

Table 4 shows that there is a statistically significant difference in the miscarriage outcome between the two groups, the miscarriage rate was significantly higher in the subchorionic hematoma group (25.3%) versus (11.6%) in the no hematoma group with a p <0.05. While (74.7%) of the ladies presented with threatened miscarriage and subchorionic hematoma continued the pregnancy without miscarriage versus (88.4%) in the no hematoma group.
The total number of cases in the hematoma group was 19 cases, 5 cases ended by fetal demise, 3 ended by incomplete miscarriage and 11 cases ended by complete miscarriage. While all the 8 cases who miscarried in the control group ended as incomplete miscarriage.

**Table 4:** The outcome of the subchorionic hematoma group versus no hematoma

| *Outcome* | *No Hematoma* | | *Subchorionic Hematoma* | | *p value* |
|---|---|---|---|---|---|
| | n | % | n | % | |
| Miscarriage | 8 | 11.6% | 19 | 25.3% | *0.035** |
| No miscarriage | 61 | 88.4% | 56 | 74.7% | |
| Total | 69 | 100% | 75 | 100% | |

*Significant difference between proportions using Pearson Chi-square test at 0.05 level.

## 5. Discussion

The relationship between clinical symptoms (pelvic pain/ bleeding), clinical and sonographic features of intrauterine hematoma (gestational age at the time of diagnosis, maternal age at diagnosis, size of the hematoma), and the outcome of pregnancy has been differently and separately investigated in the majority of the studies, with conflicting results being reported[3]-[4].

In the current study there was a statistically significant difference in the mean maternal age between the hematoma group and the control group . This finding is consistent with study done by Okan et al (2008)[5] who found that the incidence of SCH increased with increasing maternal age, but disagree with the study done by Giobbe et al (2001)P[6] and Nagy et al( 2003)P[7] both showed that there was no association between the Subchorionic hematoma and the demographic features in the study and control group.

Johns et al (2003)[8] reported that there is no significant statistical difference between the hematoma group (32.3 years) and control group (32.3 years) , Leite et al (2006)[9]also reported that the maternal age did not show a significant difference between thehematoma group ( 32 ± 1.66 years) and control group ( 30.77 ± 1.27 years) ,(p= 0.4688 ) and reported thatmaternal age is considered an independent riskfactor for adverse outcome because there is a strong correlation with chromosomal and structural fetal anomaly .

In the current study there was a statistically significant difference in the body mass index between the two groups. The BMI in SCH group was significantly more than those of the no hematoma group.

In the current study the mean gestational age at diagnosis is significantly lower in the subchorionic hematoma group than those in the no hematoma group with a p value <0.05.

This is consistent with study done by Leite et al (2006) **Error! Bookmark not defined.** who found that an early gestational age at the diagnosis may be considered a risk factor for poor outcome (p = 0.0227). Bennett et al[10] found a gestational age of 8 weeks or less was predictive of an increased percent of spontaneous abortion (OR, 2.6; 95% CI, 1.4–4.9). In 2005, Maso et al[11] reported the overall risk of adverse outcomes, especially for spontaneous abortion, was 2.4 times higher in the pregnancies with a hematoma observed before the 9th week, which is consistent with this study.

Gupta R et al( 2007)[12] and Okan et al (2008)[**Error! Bookmark not defined.**] showed that at the end of the first trimester and early second trimester, hematoma can disturb and distance the subchorionic placental growth from attached place, so that the prognosis is worse than the hematoma that occurs early in the first trimester, on the contrary to the current study , similarly Yavuz et al; (2014)[13] found that there was no statistical significant difference in the gestational age at diagnosis between the hematoma group ( 9.3± 2.8 weeks) and control group ( 10.2 ± 3.3 weeks) , p = 0.085 ,and disagree with Ben-Haroush et al.[14]who reported that gestational age at diagnosis did not affect the pregnancy outcome. Saurbrei and Pham[15] did not find any effect of duration of vaginal bleeding or gestational age at diagnosis of SCH on pregnancy outcome.

The current study showed that the parity did not affect the outcome and showed no statistical significance between the group (p> 0.05 ) ,this is similar to the study done by Yavuz et al (2014)[13] who reported that parity in both groups showed no statistical significance (p=0.581) and did not affect the outcome.

In the current study there was no statistical significance difference in the placental site between the hematoma group and the control group, the placenta was anterior in 52% of the subchorionic hematoma group versus 63.8% in the no hematoma group, and it was posterior in 48% in the subchorionic hematoma group versus 36.2% in the no hematoma group with a p = 0.153 .This is consistent with what was observed by Donogol et al (2011)[16]who reported that there is no association between the SCH and placental site compared to control group.

In the current study there was a statistically significant association between the hematoma size and miscarriage.

Ball et al. (1996)[17] reported increasing pregnancy loss rates with increasing SCH size, similarly Esen Çağsar et al

(2000)[18] found that the presence of the subchorionic hematoma and largeness of its volume significantly increase the miscarriage rate. Leite et al (2006)[9] suggests that the presence of a very large first-trimester hematoma is associated with a 46% risk of adverse pregnancy outcome (spontaneous abortion), both are consistent with the current study.

On the contrary Uluğ et al.[19] reported that there is no relationship between the prognosis and presence or size of the SCH. Nagy et al,[7]and Pedersen et al,[20] found no association between the size of the hematoma and adverse outcome. While Donogol et al (2011)[16] and Giobbe et al (2001)[6] found that when hematoma is small and asymptomatic it may not be of clinical significance. However the larger hematomas may be associated with poorer outcomes.

In the current study there is a statistically significant difference in the miscarriage outcome between the two groups, the miscarriage rate was significantly higher in the subchorionic hematoma group (25.3%) versus (11.6%) in the non-hematoma group with a $p < 0.05$. While (74.7%) of the ladies presented with threatened miscarriage and subchorionic hematoma continued the pregnancy without miscarriage versus (88.4%) in the non-hematoma group ,this is consistent with what was observed by Ozkaya et al (2011)[21] they reported that the presence of subchorionic hematoma is associated with increased risk of spontaneous abortion and Nagy et al (2003)[7] showed that the rate of spontaneous abortion was ( 18.7 % ) which is two times higher than in those pregnant without hematoma ( p= 0.02 ). Ketut et al (2011)[22] and Okan et al (2008)P [**Error! Bookmark not defined.**] showed that the risk of miscarriage in those with threatened miscarriage and had subchorionic hematoma was 3 times higher than those with threatened miscarriage and without subchorionic hematoma ,which is consistent with this study.
On the contrary Pedersen and Mantoni[20] who followed up 342 pregnancies with vaginal bleeding between 9 to 20 gestational weeks, in which 18% had SCH found no association between the presence of SCH and miscarriage. Johns et al [8] reported that first-trimester vaginal bleedings with the presence of SCH had no effect on the prognosis.

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