# Effect of Subchorionic Hematoma on Outcomes of Pregnancy in Women with Recurrent Miscarriage

By

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The current study aimed to find out the association and effect of subchorionic hematoma on outcomes of pregnancy in women with recurrent miscarriages. **Patients and method:** An analytic case-control study was conducted in the Gynecology and Obstetrics department at Salahadeen General Hospital during the period from the 1st of December 2022 to the 30th of June 2023. A convenience sample of 100 pregnant women with recurrent miscarriages was enrolled and divided into two groups: The case group: Included 50 women who had a subchorionic haematoma; Control group: Included 50 patients who did not have a subchorionic haematoma. **Results:** The number of miscarriages and preterm delivery was significantly higher in the case group compared to the control group (P-value=0.043). Among pregnant women who did not have a miscarriage, the incidences of placental abruption, placenta previa, and antepartum haemorrhage were significantly higher in the case group compared to the control group (P-values were 0.047, 0.028, 0.041, respectively). There was no significant difference between the study groups regarding maternal complications including blood transfusion, intensive care unit admission, and maternal death.

**Conclusion:** Subchorionic haematoma significantly impacted the outcome of the pregnancy as it was associated with a significantly higher number of miscarriages. subchorionic haematoma was significantly associated with a higher incidence of placental abruption, placenta previa, and antepartum haemorrhage. There was no significant impact of the subchorionic haematoma on neonatal complications.

Keywords: Recurrent miscarriage, subchorionic haematoma, Iraq

## Introduction

Miscarriage is broadly defined as the loss of a pregnancy before viability[(1)]. Another definition of miscarriage is the spontaneous loss of a pregnancy before the 24$^{th}$ week of gestation[(2)]. The Centers for Disease Control and Prevention and the World Health Organization define abortion as any pregnancy termination, spontaneous or induced, before 20 weeks gestation or with a fetal weight of 500 grams fetus at birth[(3)]. According to the guidelines, the European Society for Human Reproduction and Embryology and the Royal College of Obstetricians and Gynecologists state that clinical symptoms of recurrent spontaneous miscarriages generally manifest a history of three or more consecutive miscarriages[(4)].

There are several terms that describe different types of miscarriage, these terms include threatened, inevitable, incomplete, complete, and missed abortion[(5)].

The cause of recurrent miscarriage remains unknown in most cases[(6)]. Among many suggested causes of miscarriage, only three are widely accepted, these include parental chromosomal abnormalities, antiphospholipid antibody syndrome, and acquired or congenital uterine abnormalities[(3, 6, 7)]. Other suspected but not proven causes are environmental causes, alloimmunity, obesity, and endocrinopathies, inflammation, advanced maternal age [(8-13)]. Personal habits, such as excessive smoking (paternal or maternal), high alcohol consumption, and high caffeine intake have all been connected with an increased risk of miscarriages and recurrent miscarriages[(10)].

Intrauterine haematomas include retroplacental hematoma, marginal hematoma known clinically as subchorionic hematoma, and sub-amniotic hematoma (preplacental haematoma)[(14)]. Subchorionic hematoma is an accumulation of blood that forms a hematoma between the chorionic membrane and the decidua. The mechanism of subchorionic hematoma remains unclear[(15)]. Subchorionic hematomas are commonly observed on ultrasound scans during the first trimester, with a reported incidence varying widely, from as low as 0.46% to as high as 39.5%[(16)].

Subamniotic haematomas are rare haematomas, it may result from the rupture of chorionic vessels at the umbilical cord insertion; The majority of these haematomas are found after birth and are brought on by the umbilical cord being pulled too tightly[(17)]. The retroplacental hematoma is caused by premature detachment of the placenta while the fetus is still within the uterus. The prevalence range from 0.25% in Europe to 1% to 9% in developing countries[(18)].

Several factors have been associated with a subchorionic hematoma. Some of these include in vitro fertilization, history of uterine infections, history of uterine trauma, history of miscarriages, and high blood pressure[19, 20].

In contrast to the asymptomatic subchorionic hematoma, which is typically found on regular prenatal ultrasound, the subchorionic hematoma is typically diagnosed on ultrasound at the outpatient clinic due to signs of threatened abortion (such as discomfort or vaginal bleeding) in the first trimester[15]. A crescent-shaped hypoechoic region between the chorionic membrane and the myometrium is the sonographic diagnostic hallmark of an intrauterine hematoma[21].

There are no clear guidelines for the treatment of subchorionic hematoma[15]. Depending on the nature and degree of symptoms, the gestational age, the size and location of the subchorionic hematoma, and whether the patient is hemodynamically stable or unstable, the management should concentrate on particular patient complaints[22].

An increased risk of miscarriage, preterm premature rupture of membranes, abruption, gestational hypertension, preterm delivery, and fetal growth restriction have all been linked to subchorionic hematoma[23, 24]. Even yet, the majority of subchorionic hematomas do not cause problems for pregnant women[19, 24].

**Aim of the study:**

To find out the association and effect of subchorionic hematoma on outcomes of pregnancy in women with recurrent miscarriage

**Patients and method**

An analytic case-control study was conducted in the Gynecology and Obstetrics department at Salahadeen General Hospital during the period from the 1st of December 2022 to the 30th of June 2023. A convenience sample of 100 pregnant women with recurrent miscarriages who attended the Gynecology and Obstetrics Department during the study period was enrolled in the current study. Those patients were categorized into two groups: The case group: Included 50 women who had a subchorionic haematoma. Control group: Included 50 patients who did not have a subchorionic haematoma. **Inclusion criteria included** singleton viable intrauterine pregnancy and gestational age of 6 to 14 weeks. **Exclusion criteria included f**etal congenital abnormality, pregnant women with anatomical uterine abnormality, history of medical diseases

(diabetes mellitus and hypertension), and immunological and haematological diseases including antiphospholipid antibody syndrome, and thrombophilia.

All pregnant women were properly assessed and followed up every month during pregnancy. The adverse pregnancy outcomes and complications included miscarriage, preterm delivery (<34 weeks), preterm delivery (<37 weeks), preeclampsia, placental abruption, antepartum haemorrhage, postpartum haemorrhage, cesarean delivery, maternal intensive care unit (ICU) admission, need for blood transfusion, and maternal death. The fetal and neonatal outcomes included birth weight, Apgar scores (low when it is below 7 at one and 5 min), neonatal intensive care unit (NICU) admission, and fetal or neonatal death.

Microsoft EXCEL 2019 and Statistical Package for the Social Sciences, version 26 were used for data entry and analysis. The categorical data were presented as frequencies and percentages while the continuous data were presented as mean and standard deviation (SD). The Chi-square test and t-test were used to calculate the significance of variation between the two groups. A p-value of 0.05 was considered significant.

The study was proposed and subsequently approved by the scientific committee of the College of the Medicine/University of Tikrit. Fully informed consent was obtained from the patients verbally after explaining the aim of the study thoroughly and clearly with ensuring the confidentiality of information.

## Results

A total of 100 pregnant women were included in the current study, there was no significant difference between the study groups regarding age, as shown in table 1.

Table 1: Distribution of the age according to the study groups

| Variables | | Case group (N=50) | Control group (N=50) | Total | P-value |
|---|---|---|---|---|---|
| | | N (%) | N (%) | N (%) | |
| Age (years) | 18-20 | 5 (10.0) | 2 (4.0) | 7 (7.0) | 0.201* |
| | 21-30 | 19 (38.0) | 27 (54.0) | 46 (46.0) | |
| | >30 | 26 (52.0) | 21 (42.0) | 47 (47.0) | |
| Age (mean ±SD) | | 29.5 (6.2) | 27.7 (5.8) | | 0.142** |

There was no significant difference between the study groups regarding the distribution of body mass index (Figure 1)

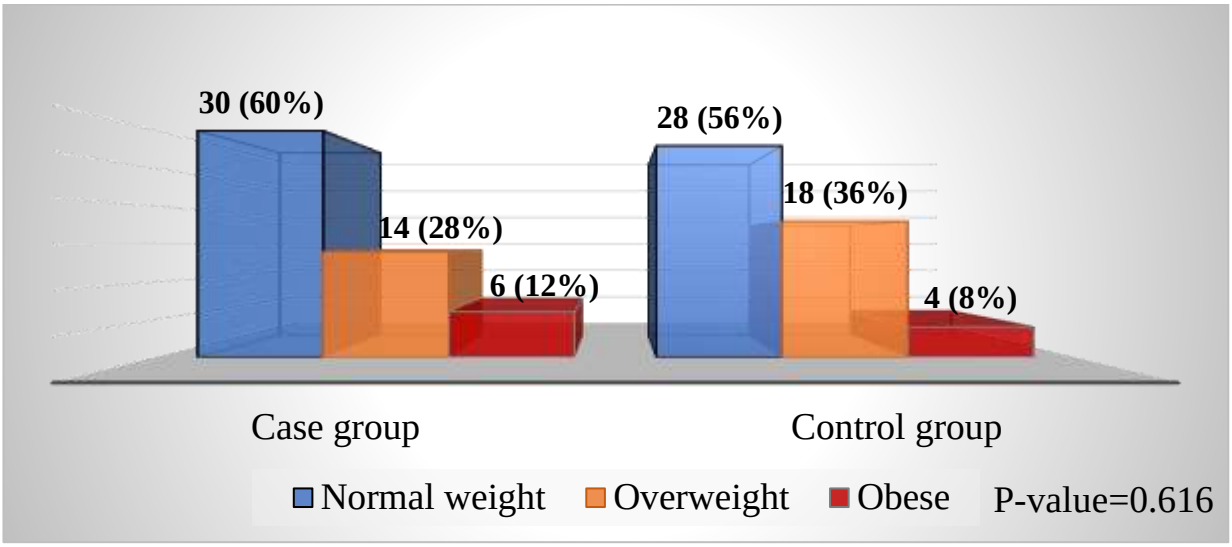


Figure 1: Distribution of the BMI according to the study groups

No significant difference was obtained between the study groups regarding the obstetrical history including the number of gravida and miscarriages (Table 2).

Table 2: Distribution of the number o gravida and miscarriages according to the study groups

| Obstetrical history | | Case group (N=50) | Control group (N=50) | Total | P-value |
|---|---|---|---|---|---|
| | | N (%) | N (%) | N (%) | |
| Gravida | 3-6 | 39 (78.0) | 43 (86.0) | 82 (82.0) | 0.298 |
| | >6 | 11 (22.0) | 7 (14.0) | 18 (180) | |
| Miscarriage | 2 or 3 | 48 (96.0) | 47 (94.0) | 95 (9.5) | 0.500 |
| | >3 | 2 (4.0) | 3 (6.0) | 5 (5.0) | |

Regarding the pregnancy outcome, the number of miscarriages was significantly higher in the case group compared to the control group (P-value=0.043), as shown in figure 2.

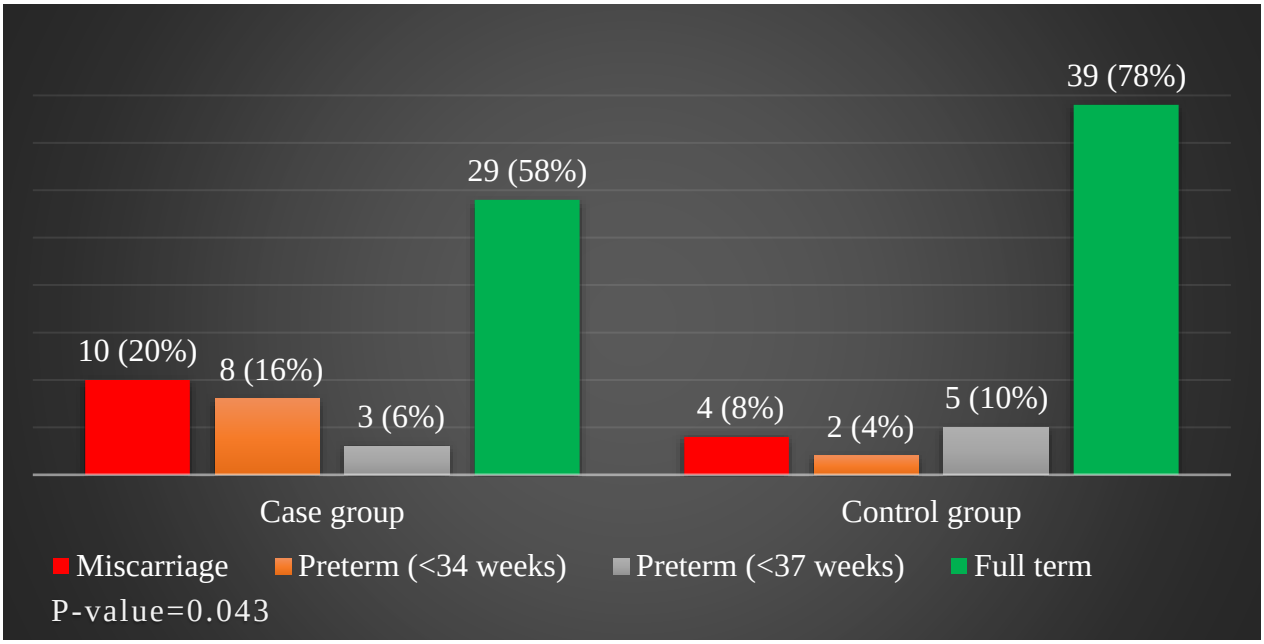


Figure 2: Pregnancy outcome

Among pregnant women who did not have a miscarriage, the incidences of placental abruption, placenta previa, and antepartum haemorrhage were significantly higher in the case group compared to the control group (P-values were 0.047, 0.028, 0.041, respectively), as shown in table 3.

Table 3: Distribution of the incidences of pregnancy complications according to the study groups

| Pregnancy complications | Case group (N=40) | Control group (N=46) | Total | P-value |
|---|---|---|---|---|
| | N (%) | N (%) | N (%) | |
| Preeclampsia | 8 (20.0) | 6 (13.0) | 14 (14.0) | 0.383 |
| Placental abruption | 7 (17.5) | 2 (4.3) | 9 (10.5) | **0.047** |
| Placenta previa | 4 (10.0) | 0 (0.0) | 4 (4.7) | **0.028** |
| Antepartum haemorrhage | 10 (25.0) | 4 (8.7) | 14 (28.0) | **0.041** |
| Postpartum haemorrhage | 4 (10.0) | 3 (6.5) | 7 (8.1) | 0.556 |
| Cesarean section | 10 (25.0) | 11 (23.9) | 21 (24.4) | 0.907 |

There was no significant difference between the study groups regarding maternal complications including the need for blood transfusion, ICU admission, and maternal death (Table 4).

Table 4: Maternal complications of the participants

| **Maternal complications** | Case group (N=50) | Control group (N=50) | Total | **P-value** |
|---|---|---|---|---|
| | **N (%)** | **N (%)** | **N (%)** | |
| Need for blood transfusion | 5 (10.0) | 2 (4.0) | 6 (6.0) | 0.240 |
| ICU admission | 2 (4.0) | 1 (2.0) | 3 (3.0) | 0.558 |
| Death | 0 (0.0) | 0 (0.0) | 0 (0.0) | * |

No significant difference was obtained between the study groups regarding the fetal outcomes including miscarriage, stillbirth, and livebirth (P-value=0.757), as shown in figure 3.

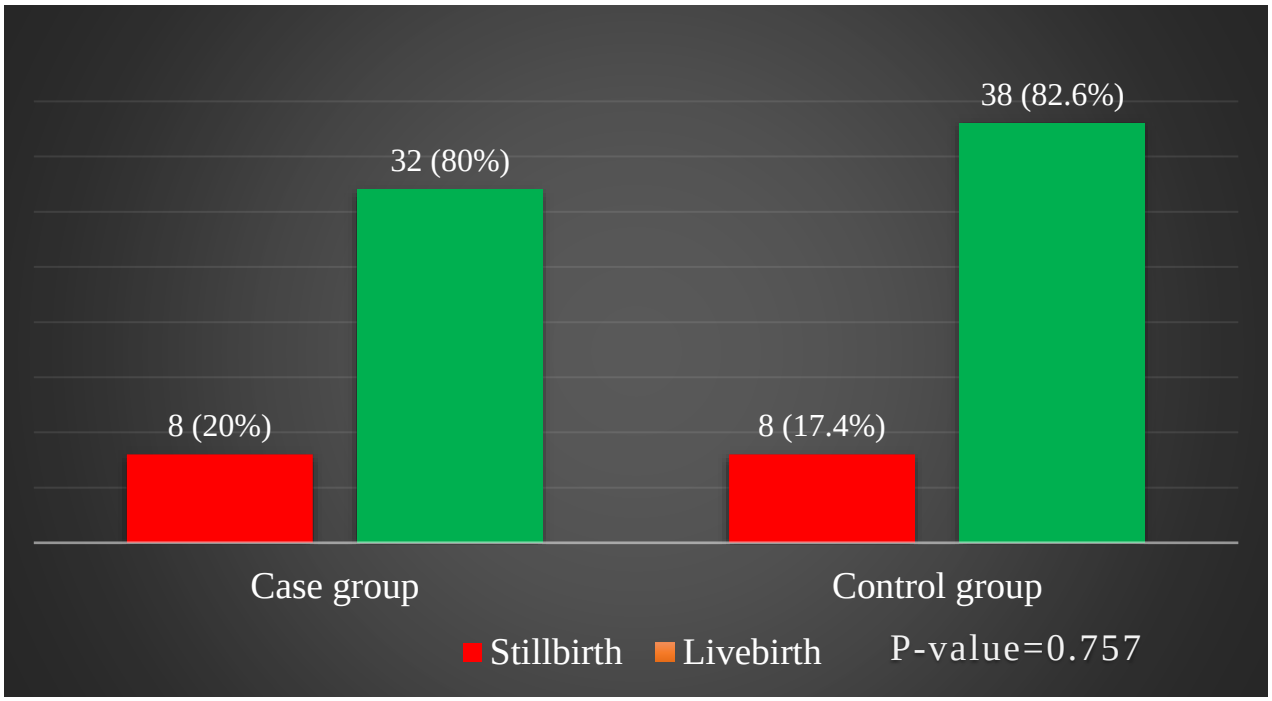


Figure 3: Fetal outcome

Among live births, there was no significant difference between the study groups regarding birth weight, APGAR score, NICU admission, and neonatal death (Table 5).

Table 5: Neonatal outcome

| Neonatal outcome | | Case group (N=32) | Control group (N=38) | Total | P-value |
|---|---|---|---|---|---|
| | | N (%) | N (%) | N (%) | |
| Birth weight | <2.5 kg | 10 (31.2) | 6 (15.8) | 16 (22.8) | 0.127 |
| | ≥2.5 kg | 22 (68.8)) | 32 (84.2) | 54 (77.2) | |
| Apgar scores | <7 | 9 (28.1) | 11 (28.9) | 20 (28.6) | 0.940 |
| | ≥7 | 23 (71.9) | 27 (71.1) | 50 (71.4) | |
| NICU admission | Yes | 13 (40.6) | 10 (26.3) | 23 (32.9) | 0.204 |
| | No | 19 (59.4) | 28 (73.7) | 47 (67.1) | |
| Neonatal death | Yes | 2 (6.3) | 2 (5.3) | 4 (5.7) | 0.859 |
| | No | 30 (93.8) | 36 (94.7) | 66 (94.3) | |

**Discussion**

Subchorionic hematomas have unclear clinical consequences due to contradictory findings. However, pregnancy loss has been linked often to subchorionic hematoma[(25)]. This study tried to evaluate the association between subchorionic haematoma and recurrent pregnancy loss among a sample of Iraqi pregnant women.

The current study revealed that there was no significant difference between the pregnant women with subchorionic haematoma and those without subchorionic haematoma regarding the age of the participants. In comparison, the same results were obtained in another study that was done by Chongjuan et al. in China (2022)[(26)]. This agrees with the results of another study that was done by Sumaira et al. (2022) in which no significant association was obtained between maternal age and the incidence of subchorionic haematoma[(27)].

There was no significant difference in the BMI between the pregnant women with subchorionic haematoma and those without subchorionic haematoma. In comparison, the same results were obtained by Zijie et al. in their study that was done in China (2023)[(28)].

No significant difference was obtained between the pregnant women with subchorionic haematoma and those without subchorionic haematoma regarding the gravida. This agrees with the same results that were obtained in another study that was done in Turkey (2022)[(24)].

In the current study, the incidence of miscarriage was significantly higher in pregnant women with subchorionic haematoma compared to those who did not have subchorionic haematoma. In agreement, the incidence of miscarriage was significantly higher among pregnant women with subchorionic haematoma than others as revealed in another study that was done by Chongjuan et al. in China (2022)[26]. In agreement, the same results were obtained in another study that was done by Sumaira et al. in Pakistan (2022)[27].

In contrast, no significant difference was obtained between pregnant women with subchorionic haematoma and those without regarding the incidence of miscarriage, and preterm labour in another study that was done in China (2023)[28]. This might be related to variations in definitions and other impacting factors that could affect the outcome of pregnant women with subchorionic haematoma.

Pregnant women with subchorionic haematoma had a significantly higher incidence of placental abruption, placenta previa, and antepartum haemorrhage than other pregnant women. In agreement, the same results were obtained in another study that was done by Taner and Oğuz in Turkey (2022)[24].

In contrast, no significant difference was obtained between pregnant women with subchorionic haematoma and other pregnant women regarding the incidence of antepartum haemorrhage as revealed in another study that was done in Pakistan (2022)[27].

There was no significant difference in the current study between the study groups regarding the incidence of preeclampsia. This agreed with the results of another study that was done by Taner and Oğuz in Turkey (2022)[24]. This agreed with the results that were obtained in another study which was one in China by Zijie et al. (2023)[28].

No significant difference was obtained between the study groups regarding the maternal outcome including the need for blood transfusion, ICU admission, and death. In comparison, the need for blood transfusion was insignificantly different between pregnant women with subchorionic haematoma and those without subchorionic haematoma as revealed by another study that was done by Mackenzie et al. (2019)[29]. In Turkey, no maternal death was reported in the study that was done there by Zekiye Soykan Sert (2022) and included 133 pregnant women with subchorionic haematoma[30]. This might be explained by the fact that most subchorionic haematomas were not associated with dangerous complications.

There was no significant difference between the study groups regarding the incidence of live births with low birth weights. In agreement, the same results were obtained in another study that was done by Sumaira et al. in Pakistan (2022)[27]. This agreed with the results that were obtained in another study that was done by Guangzhou et al in China (2020)[31].

In conclusion, the subchorionic haematoma significantly impacted the outcome of the pregnancy as it was associated with a significantly higher number of miscarriages. Subchorionic haematoma was significantly associated with a higher incidence of placental abruption, placenta previa, and antepartum haemorrhage. There was no significant impact of the subchorionic haematoma on neonatal complications.

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