

First Trimester Subchorionic Hematoma and Outcome of Pregnancy

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Abstract

Background and objective: Defined as the collection of blood between the chorionic membrane and the uterine wall, subchorionic hematoma can be associated with adverse pregnancy outcomes and even miscarriage. The present study was carried out in order to evaluate the effects of first-trimester subchorionic hematoma on pregnancy outcomes.

Patients and methods: The present study was an observational prospective case-control study which was conducted on 200 pregnant women in Erbil teaching hospital, Erbil, Iraq over a period of one year from April 2019 to April 2020. The women were assigned into two groups, a case group consisting of 100 women with subchorionic hematoma and a control group including 100 women without subchorionic hematoma. Required data were collected based on the women's full history and examination. The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS version 25.0). **Results:** age of most of women in our study was between 20-30 years old, although we couldn't find any association between subchorionic hematoma and age of the woman. Most of the cases (97%) and controls (95%) did not smoke (p-value=0.721). The cases and controls were not significantly different in terms of miscarriage, most of them did not have miscarriage (p-value=0.182). The results revealed a significant association between current miscarriage and history of previous miscarriage (p-value<0.001). The cases and controls were not significantly different in terms of 2nd and 3rd trimester vaginal bleeding, mode of delivery, intrauterine fetal death, newborn admission to NCU, congenital anomalies, age, parity, Apgar score in first minute, and Apgar score in 5th minute (p-value>0.05). However, they were significantly different regarding their birth weight (p-value=0.12). **Conclusion:** There are no significant correlations between having subchorionic hematoma and miscarriage; however, the odds of miscarriage are slightly higher in women with subchorionic hematoma. Newborns of women with subchorionic hematoma generally have a lower birth weight.

Keywords: Subchorionic hematoma, pregnancy, first trimester, miscarriage, pregnancy outcome.

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INTRODUCTION

Subchorionic hematoma has been reported to have varying incidence ranging from 0.46 to 39.5%. It can be diagnosed through ultrasound examinations [1]. Over 60% of hematomas happen within the first trimester and typically disappear during three months after diagnosis. Pregnancy loss is one of the most widely reported adverse outcomes that is associated with intrauterine hematoma [2]. It has been reported that pregnant women with subchorionic hematoma (SCH) have a higher risk of pregnancy loss than others [3]. During the first trimester, 25% of pregnant women might experience vaginal bleeding. Threatened abortion refers to intrauterine bleeding during the early stages of pregnancy. Typically, this bleeding is not associated

with cervical dilatation, tenderness, excessive bleeding, or pain [4].

It is important to perform sonographic visualization of subchorionic hematoma in women who have no symptoms because prognosis is worse in pregnant women with a demonstrable hematoma in comparison with those without a hematoma. However, it should be mentioned that prognosis cannot be worsened as a result of small, asymptomatic subchorionic hematomas [1, 5].

The outcome of the fetus in women who are diagnosed with subchorionic hematoma through sonographic visualization is dependent on the fetus's gestational age, the mother's age, and the size of the hematoma. In this regard, it has been confirmed that

increase in maternal age and hematoma size can result in elevated rates of miscarriage. Moreover, the prognosis can be worsened due to late first- or second-trimester bleeding. As a result of subchorionic hematoma (which can alternatively be called subchorionic hemorrhage) diagnosed through sonography, the risk of preterm labor, placental abruption, stillbirth, and miscarriage can increase [6].

As a result of subchorionic hematoma, blood collects between the chorionic membrane and the uterine wall and might leak through the cervical canal. Due to continuation of subchorionic hematoma during late first trimester and early second trimester, the developing placenta might be partially stripped away from its attachment site. As a result, the prognosis of patients with this type of hematoma is worse than the prognosis of patients with hematoma in early first trimester [7].

In terms complications, it has been reported that intrauterine hematoma is associated with maternal anxiety and other adverse fetal/maternal outcomes [8]. In addition, increased risk of small-for-gestational-age neonates, placental abruption, preeclampsia, and pregnancy-induced hypertension have been reported to be among the complications caused by intrauterine hematomas in singleton pregnancies [9]. Furthermore, reports obtained from singleton pregnancies have indicated that subchorionic hematoma during the first trimester has no independent association with pregnancy loss prior to 20 weeks of gestation or with adverse pregnancy outcomes after 20 weeks of gestation [10].

The exact etiology of subchorionic hematoma is not fully known; however, immunological factors, autoimmune diseases, pre-existing medical conditions, infections, history of recurrent pregnancy loss, and uterine malformations are believed to be predisposing factors. Small and medium-size subchorionic hematomas typically regress, while large ones can become larger and strip at least 30-40% of the placenta away from the endometrium, resulting in compression of the gestational sac and spontaneous abortion [11, 12].

Ultrasound examination can show intrauterine hemorrhages as hypoechoic or anechoic crescent-shaped areas, particularly among patients who have clinically evident bleeding during their early pregnancy [13]. Partial detachment of the chorionic membranes from the uterine wall has been referred to be the probable cause of subchorionic hematomas. The clinical significance of SCH is still controversial [14-16]. The objective of this research is to estimate the implications of subchorionic hematoma in the 1st trimester and how it affects the outcomes of pregnancy.

PATIENTS AND METHODS

Study design and setting

The present observational prospective case-control study was conducted in Erbil teaching hospital, Erbil, Iraq over a period of one year from April 2019 to April 2020.

Study sample and sampling method

The study consisted of 200 pregnant women who were chosen by a convenience sampling method from among those pregnant women who attended the outpatient department in the first trimester of their pregnancy (less than 13 weeks). The selected women were assigned into two groups; 100 cases and 100 controls. The cases were those women whose ultrasound examination proved to have subchorionic hematoma with or without vaginal bleeding, and the controls were those who did not have subchorionic hematoma. Moreover, the inclusion criteria were all the pregnant women with singleton pregnancy in the first trimester and positive fetal heart by ultrasound. And, the exclusion criteria were multiple gestation pregnancies, second or third trimester subchorionic hematoma, IVF pregnancies and those who had negative fetal heart by ultrasound.

Data collection

Required data were collected between April 2019 and April 2020 at Erbil maternity teaching hospital. For this purpose, a full history and examination was taken from both groups. Both groups were followed up until the end of pregnancy by multiple visits for assessment by history. The conducted examinations and investigations included ultrasonography to know how many of them became miscarriage and how many of them developed 2nd trimester vaginal bleeding, 3rd trimester vaginal bleeding, history of previous pregnancy loss, at which gestational age they delivered and the mode of delivery. Moreover, the babies were assessed for their weight at delivery, Apgar score, admission to NICU, and any known congenital anomaly.

Statistical analysis

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS version 25.0). In so doing, descriptive and inferential statistics tests (including t-test and chi-square test) were utilized. A significance level of <0.05 was considered to be statistically significant.

Ethical considerations

To take ethical considerations into account, the protocol of the study was approved by the ethics committee of Kurdistan Board of Medical Specialties (KBMS). In addition, written informed consent was obtained from the participants whose were also provided with sufficient information about the aim and duration of the study. They were also informed that they could quit the study whenever they wished to. Also, confidentiality and anonymity of data were

ensured. Finally, required permission was obtained from the authorities of Erbil maternity teaching hospital.

RESULTS

As shown by the results, over half of the women in both groups aged 20-29 years (57% in the

case group and 53 in the control group), followed by age group 30-39 with 32% in the case group and 35% in the control group. The two groups were not significantly different in terms of their age (p-value=0.8) (See Table 1).

Table-1: Relationship between the women’s age and subchorionic hematoma

		Group		Total	p-value
		Case	Control		
Age groups	< 20 years	7	9	16	0.4876
		7.0%	9.0%	8.0%	
	20-29 years	57	53	110	
		57.0%	53.0%	55.0%	
	30-39 years	32	35	67	
		32.0%	35.0%	33.5%	
	>40 years	4	3	7	
		4.0%	3.0%	3.5%	

The results showed that most of the cases (97%) and controls (95%) did not smoke, and they were

not significantly different in this regard (p-value=0.721) (See Table 2).

Table-2: The relation between subchorionic hematoma and smoking

		Group		Total	p-value
		Case	Control		
Smoking	Yes	3	5	8	0.721
		3.0%	5.0%	4.0%	
	No	97	95	192	
		97.0%	95.0%	96.0%	

As revealed by the results, most of the cases (80%) and controls (87%) did not experience

miscarriage, and they were not significantly different in this regard (p-value=0.182) (See Table 3).

Table-3: The relation between subchorionic hematoma and miscarriage

		Group		Total	p-value
		Case	Control		
Miscarriage	Yes	20	13	33	0.182
		20.0%	13.0%	16.5%	
	No	80	87	167	
		80.0%	87.0%	83.5%	

The results indicated that there was a significant relation between history of miscarriage and

subchorionic hematoma which causes miscarriage (p-value<0.001) (See Table 4).

Table-4: The relation between subchorionic hematoma causing miscarriage and previous miscarriage

		Current miscarriage		Total	p-value
		Yes	No		
History of miscarriage	Yes	15	20	35	<0.001
		75.0%	25.0%	35.0%	
	No	5	60	65	
		25.0%	75.0%	65.0%	

The results showed that there was no significant difference between the cases and control in terms of vaginal bleeding during their second trimester

(p-value=0.105), such that most of the cases (93.8%) and controls (98.9%) did not have second trimester vaginal bleeding (See Table 5).

Table-5: The relation between cases and controls regarding second trimester vaginal bleeding

		Group		Total	p-value
		Case	Control		
2 nd trimester vaginal bleeding	Yes	5	1	6	0.105
		6.3%	1.1%	3.6%	
	No	75	86	161	
		93.8%	98.9%	96.4%	

As shown by the results, the cases and controls were not significantly different regarding vaginal bleeding during their third trimester (p-value=0.671),

such that most of the cases (96.3%) and controls (97.7%) did not have third trimester vaginal bleeding (See Table 6).

Table-6: The relation between the two groups regarding third trimester vaginal bleeding

		Group		Total	p-value
		Case	Control		
3 rd trimester vaginal bleeding	Yes	3	2	5	0.671
		3.8%	2.3%	3.0%	
	No	77	85	162	
		96.3%	97.7%	97.0%	

According to the results, the cases and controls were not significantly different in terms of their mode of delivery (p-value=0.671), such that mode of delivery

was normal vaginal in most of the cases (84.6%) and controls (86.2%) (See Table 7).

Table-7: The relation between the cases and controls regarding mode of delivery

		Group		Total	p-value
		Case	Control		
Mode of delivery	Normal vaginal	67	75	142	0.798
		84.8%	86.2%	85.5%	
	Caesarean section	12	12	24	
		15.2%	13.8%	14.5%	

The result revealed no significant difference between the cases and controls regarding intrauterine fetal death (IUFD) (p-value=0.470), such that the

newborns were alive in most of the cases (98.7%) and all controls (100%) (See Table 8).

Table-8: The relation of subchorionic hematoma with IUFD (Intra Uterine Fetal Death)

		Group		Total	p-value
		Case	Control		
Newborn	Alive	76	87	163	0.470
		98.7%	100.0%	99.4%	
	Dead	1	0	1	
		1.3%	0.0%	0.6%	

The results indicated that there was no significant difference between the cases and controls in terms of the admission of their neonates to neonatal

care unit (NCU) (p-value=0.168), such that most of the case neonates (82.1%) and control neonates (89.5%) were not admitted to NCU (See Table 9).

Table-9: The relation between cases and controls regarding the admission of baby to neonatal care unit

		Group		Total	p-value
		Case	Control		
Admission to NCU	Yes	14	9	23	0.168
		17.9%	10.5%	14.0%	
	No	64	77	141	
		82.1%	89.5%	86.0%	

developing congenital anomalies (p-value=0.234), such that most of the case (97.5%) and all controls (100%) did not develop congenital anomalies (See Table 10).

According to the results, the cases and controls were not significantly different with regard to

Table-10: The relation between the cases and controls in terms of congenital anomaly

		Group		Total	p-value
		Case	Control		
Congenital anomalies	Yes	2	0	2	0.234
		2.5%	0.0%	1.2%	
	No	79	86	165	
		97.5%	100.0%	98.8%	

Further comparison between the two groups revealed that they were significantly different in terms of their birth weight (p-value=0.012), such that the

cases weight less than the controls (3.05 versus 3.30 kg) (See Table 11).

Table-11: The relationship between cases and controls in terms of other variables

Variables	Group	N	Mean	Std. Deviation	p-value
Age	Case	100	27.90	6.078	0.670
	Control	100	27.53	6.180	
Parity	Case	100	2.14	1.676	0.559
	Control	100	2.01	1.460	
Birth weight (kg)	Case	79	3.05	0.637	0.012
	Control	87	3.30	0.623	
APGAR score 1	Case	81	7.35	1.305	0.234
	Control	86	7.56	0.977	
APGAR score 5	Case	80	8.61	0.987	0.956
	Control	86	8.60	0.858	

DISCUSSION

According to the results of the present study, there was no significant difference between the patients with subchorionic hematoma and control patients in terms of their age, which reveals the fact that subchorionic hematoma can develop in pregnant women regardless of their age.

The results of the study conducted by Peixoto et al. confirmed a remarkable association between placental abruption and maternal smoking [17]. Moreover, it has been shown that a rise in the number of cigarettes smoked per day increases the risk of placental abruption [18]. In justifying this effect, it has been stated that smoking causes constriction of blood vessels in pregnant women who smoke. As a result, there will be a decrease in blood flow and a drop in the supply of oxygen and nutrients required by the fetus. This deprivation can also lead to development of growth retardation signs [19]. In this regard, the results of the present study demonstrated that there was no significant association between smoking and subchorionic hematoma.

In their study, Yamada et al. reported that miscarriage risk rises during the first 20 weeks of gestation in pregnant women with vaginal bleeding and

threatened abortion as a result of subchorionic hematoma diagnosed through ultrasonography. However, pregnancy outcome measures of ongoing pregnancies cannot be remarkably affected [7]. Unlike this finding, the results of the present study indicated that subchorionic hematoma could not have a significant effect on miscarriage. In a similar study carried out in Iraq, Al-Bassam et al. Observed elevated risk for adverse maternal and neonatal outcomes in women with threatened miscarriages and subchorionic hematoma [20].

Moreover, the results of the present study demonstrated that there was a significant relationship between the history of miscarriage and subchorionic hematoma which causes miscarriage. In a similar study by Yue et al., pregnancy outcomes can be significantly affected by the persistence of subchorionic hematoma during the pregnancy, increase in its size, and gestational age of the subchorionic hematoma at the time of resolution. In this regard, they recommended further studies on separate analyses of persistent hematomas in comparison with those that are treated over time to assess their relationship with pregnancy loss and other adverse pregnancy outcomes. Moreover, they demonstrated that in women with singleton pregnancies, there is no significant independent

association between the presence of subchorionic hematoma before 14 weeks of gestation and pregnancy loss before 20 weeks of gestation, regardless of the presence of vaginal bleeding and the size of subchorionic hematoma [21].

The results of the present study revealed that there was no significant difference between the cases and controls regarding their vaginal bleeding during their second and third trimesters. In this regard, the results of the study carried out by Retha et al. pointed out that subchorionic bleeding refers to the collection of blood between the uterus and the gestational membranes during pregnancy, which is regarded as the main cause of vaginal bleeding within the first and second trimesters of pregnancy. They reported that 1.7% out of the studied 64,000 pregnant women experienced a subchorionic hemorrhage during their pregnancy [22].

The results of the present study showed that there is no significant difference between the cases and controls regarding intrauterine fetal death such that the newborns were alive in most of the cases and all controls. In this regard, the results of a study by AL Sultani in Iraq indicated that first-trimester subchorionic hematoma could lead to an increase in the risk of death. They also indicated that in addition to low gestational age, some intrinsic fetal abnormality of some increasing maternal pathology is responsible for intrauterine fetal death [23].

Zhou et al. demonstrated that there is an association between subchorionic hematomas and increased risks of preterm birth, placental abruption, and stillbirth. They also found associations between subchorionic hematomas and higher rates of cesarean delivery, preeclampsia, gestational hypertension, and low birth weight [24]. In line with these findings, the results of the present study showed that the two studied groups were significantly different in terms of their birth weight, such that birth weight was lower in women with first-trimester subchorionic hematoma compared to the controls.

CONCLUSION

Subchorionic hematomas slightly raise the risk of miscarriage in pregnant women, but this effect is not statistically significant. Moreover, it is not fully confirmed whether the presence of subchorionic hematomas elevates the risk of adverse pregnancy outcomes in ongoing pregnancies or not. The history of previous miscarriage and subchorionic hematoma were significantly correlated. Moreover, birth weight was found to be lower in women with first-trimester subchorionic hematoma than others.

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