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The Role of Ultrasound in detection of sub chorionic hematoma

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ABSTRACT

Objective: The role of trans abdominal ultrasound and its specificity and sensitivity in the diagnosis of sub chorionic.

Setting: The study was conducting in Al-Al-Batool Hospital (teaching hospital in Mosul city) covering 1 year period from the first of January 2010 to 31 December 2010.

Patient and methods: Retrospective study is performed including pregnant women attending emergency and out patients department. Patients are grouped into cases (patients with sub chorionic hematoma) and control (patients without sub chorionic hematoma with vaginal bleeding), both groups during the first twenty weeks of pregnancy. Chi-square test was used for analysis of data.

Results: The number of cases was (220) patients with sub chorionic hematoma and vaginal bleeding, while the number of control was (780). All these (1000) patients are during the first twenty weeks of gestation. The incidence of abortion is the highest one 92 patients (41. 82%) out of 220 patients. Sensitivity of ultrasound was (91 %), specificity was (92%).

Conclusion: Trans abdominal ultrasound is sensitive for diagnosis of sub chorionic hematoma. Increasing maternal age, parity and gravity are considered increased risks for development of sub chorionic hematoma.

Keywords: sub chorionic hematoma- trans abdominal ultrasound- vaginal bleeding- complication of sub chorionic hematoma (abortion).

INTRODUCTION

Separation of the placenta from the myometrium where it is implanted causes bleeding, when only the margin of the placenta is separated, it is called a marginal sub chorionic hematoma. when the bleeding is behind the placenta, it is termed a retro placental bleeding. The term " abruption"(abruption placentae) is typically reserved for premature placental separation occurring after 20 weeks. Sub amniotic bleeding is a collection anterior to the placenta and limited by the umbilical cord [(1)].

Sub amniotic hematomas are observed on ultrasound in early pregnancy in 0.5% to 22% of women, and some studies suggest that the presence of subchorionic hematomas may increase the risk of miscarriage, However, the relationship between the location of Sub amniotic hematomas and subsequent pregnancy outcome has not been examined.

Recent articles about placental separation point out that there are 2 types of separation. arterial and venous. Arterial bleeding leads to abruption placentae, whereas venous hemorrhage represents marginal, terminal, and chronic abruptions and manifests with slight or moderate vaginal bleeding and little or no disturbance of maternal and fetal condition.[(2)]. While chronic venous separation results in preterm delivery at approximately 28 weeks of gestation [(3)].

Massive sub chorionic hematoma (MSH), is a rare condition in pregnancy in which a large amount of blood, mainly maternal, collects and dissects the chorionic and the villous chorion and its a serious condition in pregnancy that is frequently complicated by perinatal abnormalities such as intrauterine growth retardation (IUGR) and intrauterine fetal death (IUFD) [(4-6)].

Sub chorionic bleeding may be associated with abnormal coagulative states suggesting that underlying etiology may be related to hypercoagulability in the maternal circulation. The presence of a SCH may be the first indicator underlying thrombophilia and thus, it is suggested that women who have placentas showing SCH should undergo thrombophilia workup[7,8]. Intrauterine hematoma is not an uncommon finding at ultrasound scanning in the early stages of pregnancies. Pre-existing medical conditions, autoimmune diseases, and immunological factors have been associated with intrauterine hematoma, but the etiology of this condition is still unknown [9].

Sonographic feature of subchorionic hematoma:

Trance abdominal sonography: in the first trimester may show the presence of a crescent- shaped echo-free area outlining the intact gestational sac, and beyond 13 weeks gestation, an echo-free, usually elongated area between the uterine wall and the fetal membranes. The typical utrasonographic picture of subchorionic hematoma in the second trimester consists of large fluid collection surrounded by thin wall extending around the gestational sac and fetal membranes, often arising from the placental margin. No signs of placental separation from the uterine wall were detected. Thus, the origin of the intrauterine bleeding could not be specifically determined, although minor placental abruption seem the most likely cause. Two types of intrauterine membrane abnormality could be described: separation of the chorion and amnion, and elevation of the chorion. The first shows lack of apposition between the chorion and the aminion. The second elevation of the chorion, is caused by separation of the chorion from its underlying maternal decidua. They considered the first as more detrimental to pregnancy outcome, but it was difficult to distinguish between the two types sonographically[10].

The ultrasonographic appearance of abruption depends on a large extent on the size and location of the bleed, as well as the duration between the abruption and the time the ultrasonographic examination was performed, in the acute phase it was hyperechoic to isoechoic when compared with the placenta. Later on, as the hematomas resolved, they became hypoechoic within 1 week and son lucent within 2 weeks. In some cases only a thickened heterogenous placenta could be seen [11].

It is not uncommon to have normal ultrasonographic picture in the presence of frank abruption. positive ultrasonographic features of abruption include a bulky or an enlarged, globular placenta and the presence of a retro placental or ret membranous clot. Follow- up is done with the aim of monitoring the clot size and the utrasonographic features of the colt. An organized clot is more echogenic. As the time passes, the clots become echo-free. Hematomas can exist at different locations. Subchorionic hematomas are more common prior to 20 weeks, whereas after 20 weeks, retroplcental hematomas are encountered more often. Preplacental hematomas are the least common. [12].

The aims of study:

1- To assess the validity of ultrasound in the diagnosis of subchorionic hematoma.
2- To Determine prognostic factors in pregnancies with a subchorionicecholoncency.
3-To evaluate the outcome of pregnancies complicated by very large hematomas in the first trimester.

MATERIALS AND METHOD

Retrospective study was performed covering (1) year period from 1st January 2010 to the end of December 2010 on 1000 pregnant women, to those patients who attending emergency department in Al- Batool Hospital, which is a center of the teaching hospital in Mosul city. Follow up was done for the patients during their regular visits monthly to the hospital by clinical and sonographic examination. Pregnant women with hematoma during the 1st half of pregnancy (20 weeks) were considered as cases, and these patients were followed till their end results of pregnancy, while the control with vaginal bleeding during the same period of pregnancy without subchorionic hematoma, so the following up was done to these patients till their end results of pregnancy. A serial ultrasound was done to all these patients during the period of pregnancy.

The type of ultrasound machine used is Philips Enviser H. D, 2009 with its serial NO. USD 0801278 using curved probe of 3.5 MHzs, with convex sector, and the patients lie on the table in supine position transabdominal approach is used. These patients were examined with a copious amount of coupled agent (gel) in lower abdomen and abdominal Ultrasonography is performed by transverse and vertical and some time oblique planes are used, examination lasting from 10- 20 minute.

According to the clinical and ultrasonic findings, these patients were grouped 1st group was those with subchorionic hematoma, 2nd group was those with threatened abortion, 3rd group was those with ectopic pregnancy, 4th group was those with missed abortion, and the 5th group was those with hydatidiform mole.

The ultrasound report and the end results findings of the patients was included within the forma (cases control design) which was used to asses each patient in this study, these forma include:

Name, Age, place, Parity, Family History, Clinical sign and Symptom, and Ultrasound Findings report including determination of gestational viability age and number of fetus, presentation of the fetus liquor amount, position of placenta, and location, the presence of blood clot small, moderate and big size. The patients were followed up at the hospital for the end results findings, whether the patients end with abortion, premature rapture of membrane, for the low birth weight and the presence of blood clot under the chorionic membrane of the placenta after labour at the hospital.

RESULTS

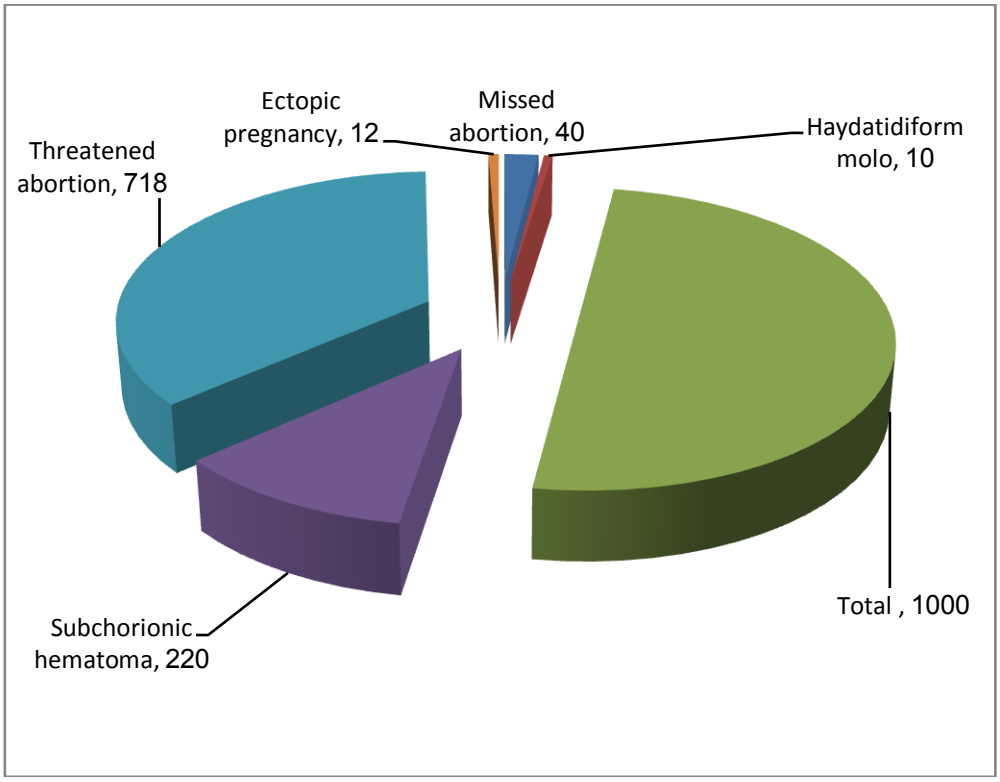
In this study out of 1000 patients the number of subchorionic hematoma were 220 patients (22%), and threatened abortion were 718 Patients (71.8%), which is the highest incidence, then Ectopic pregnancy were 12 patients (1.2%), (Figure 4), and the number of missed abortion were 40 patients (4%). (Figure 5,6), finally hydatidiform mole were found to be only 10 patients (1%) which is the least one, with a Chi- square value 9.23 at predictive value 0.002 < 0.05 significant, as shown in (Table 1and Pie chart 1).

Table 1: Causes of vaginal bleeding for pregnant women at 1st half of pregnancy out of 1000 patients.

Causes	No. of patients	% out of 1000 patients
Subchorionic hematoma	220	22
Threatened abortion	718	71.8
Ectopic pregnancy	12	1.2
Missed abortion	40	4
Haydatidiforma mole	10	1
Total	1000	100

Corrected Chi- square = 9.23 at P-value = 0.002 <0.05 significant

Pie chart 1: Causes of vaginal bleeding for pregnant women at fist half of pregnancy out of 1000 patients



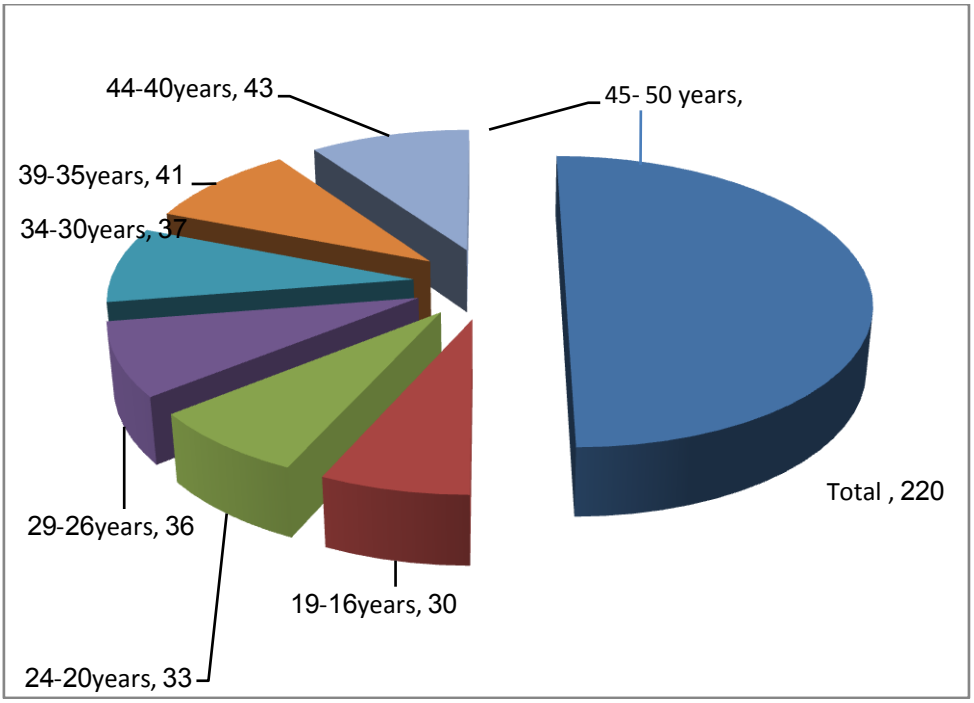
In this study the age distribution of subchorionic hematoma grouped asin(Table 2 and Pie chart 2).

Table2: Relations of subchorionic hematoma with age distribution out of 220 patients.

Age distribution	No. of patients	% out of 220 patients
15- 19 years	30	13.64
20- 24 years	33	15
25- 29 years	36	16.36
30- 34 years	37	16.82
35- 39 years	41	18.64
40-44 years	43	19.54
45- 50 years	0	0
Total	220	

Corrected Chis- square= 6.35 P- value = 0.003 < 0.05 significant

Pie chart 2: Relations of subchorionic hematoma with age distribution out of 220 patients

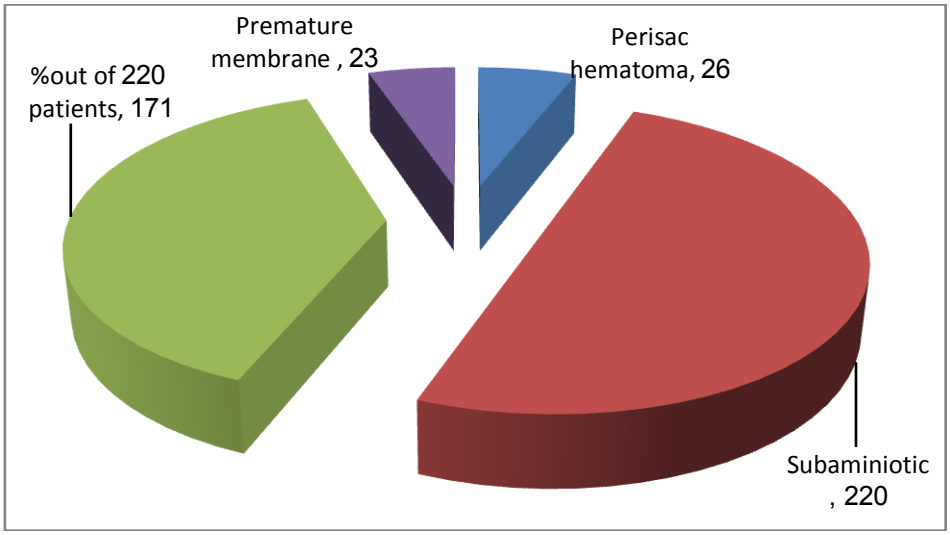


The types of subchorionic hematoma as in (Table 3 and Pie chart 3).

Table 3: Types of subchorionic hematoma out of 220 patients

Types of subchorionic	No. of patients	% of patients out 220	% of patients out of 1000
Marginal subchorionic hematoma	171	77.7	17.1
Subaminiotic hematoma	23	10.5	2.3
Perisac hematoma (physiological hematoma)	26	11.8	2.6
Total	220	100	22

Pie chart 3: Types of subchorionic hematoma out of 220 patients.



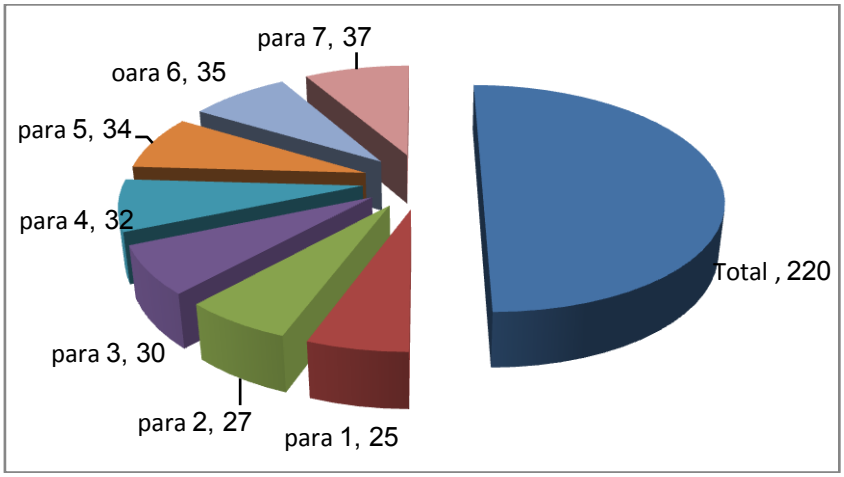
The relations of subchorionic hematoma with number of parity.

Table 4: Relations of subchorionic hematoma with no. of parity out of 220 patients

Age distribution	No. of patients	% out of 220 patients
Para 1	25	11.36
Para 2	27	12.3
Para 3	30	13.64
Para 4	32	14.54
Para 5	34	15.45
Para 6	35	15.91
Para 7	37	16.8
Total	220	100

Corrected Chi-square = 9.33 at P- value = 0.03<0.05 significant

Pie chart 4: Relations of subchorionic hematoma with no. of parity out of 220 patients



The relations of subchorionic hematoma with number of gravity.

Table 5: Relation of subchorionic hematoma to gravity of the patients.

Gravity	No. of patients	% out of 220 patients
Gravida one	1	0.4
Gravida two	17	7.72
Gravida three	20	9.09
Gravida four	31	14.09
Gravida five	34	15.45
Gravida six	36	16.36
Gravida seven	37	16.81
Gravida eight	44	20
Total	220	100

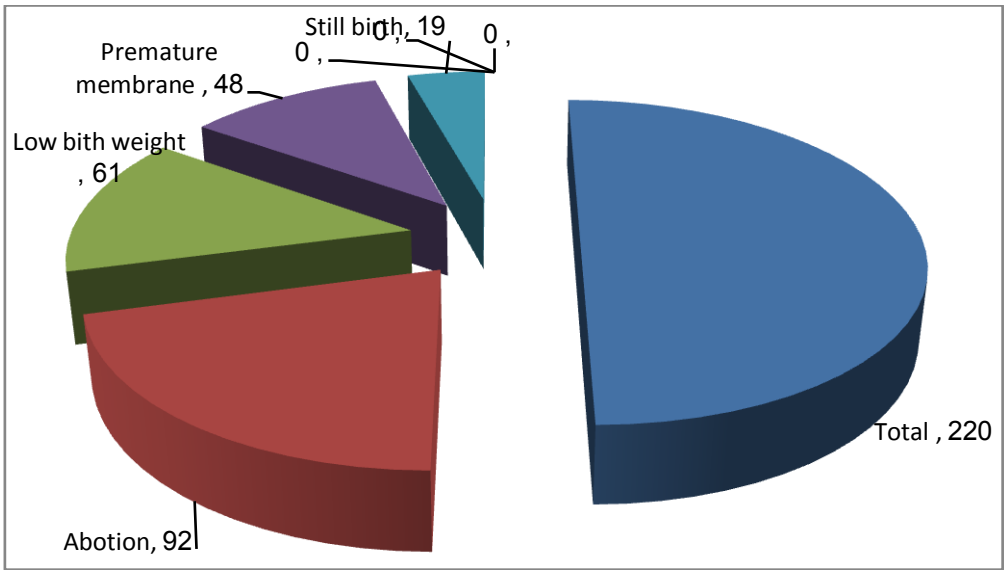
The end results of subchorionic hematoma out of 220 patients, shown in (Table 6 and Pie chart 5).

Table 6: End results of subchorionic hematoma out of 220 patients.

Causes	No. of patients	% out of 1000 patients
Abortion	92	41.82
Low birth weight	61	27.72
Premature rupture membrane	48	21.82
Still birth	19	8.64
Total	220	100

Chi- Square value 8.23 at predictive value 0.002 < 0.05 significant

Pie chart 5: End results of subchorionic hematoma out of 220 patients

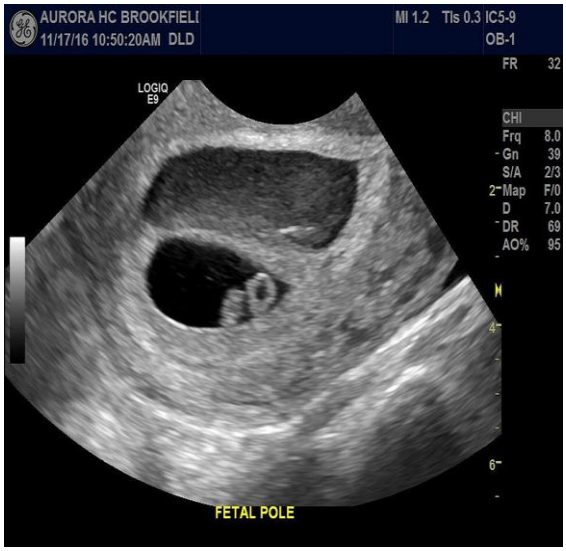


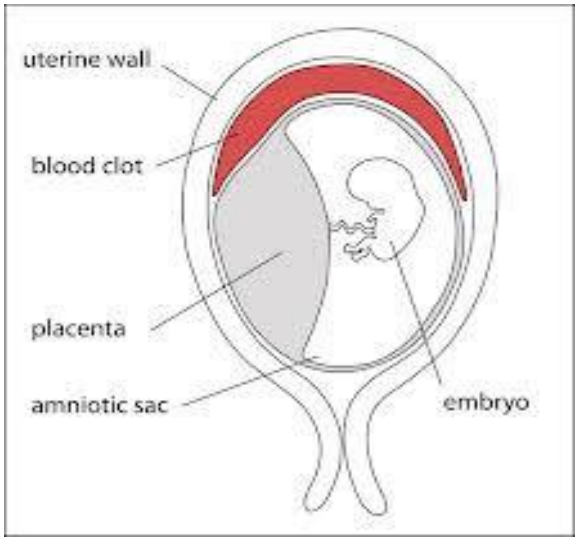
The results of screening test: the validity of ultrasound in the diagnosis of subchorionic hematoma as in (Table 7).

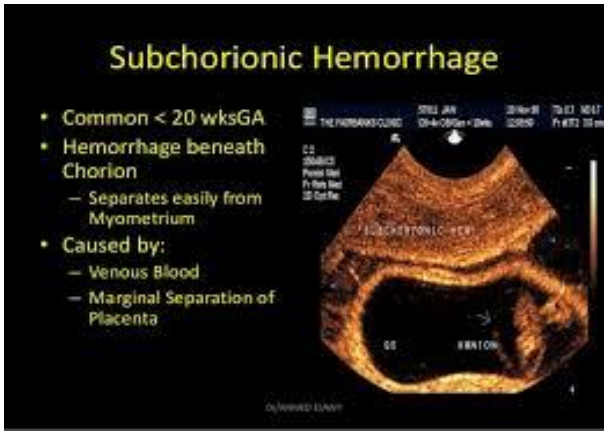
Table 7: Results of Screening tests

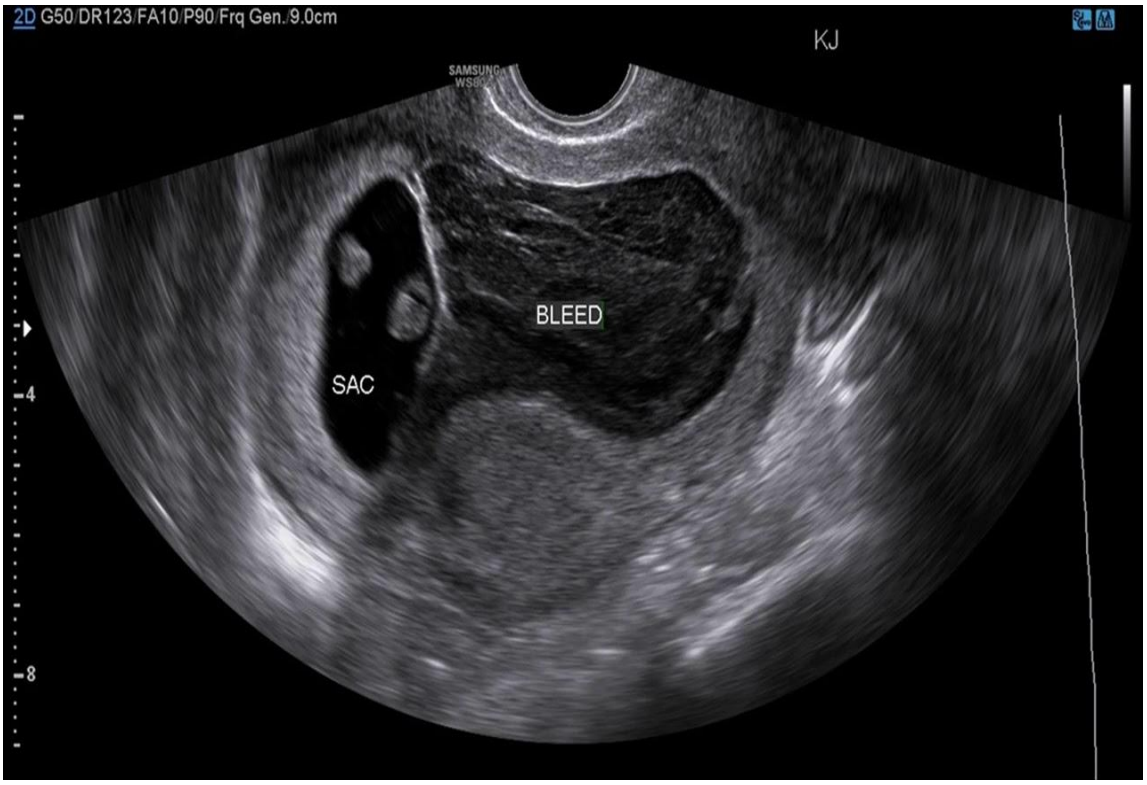
Screening test	Gold Standard subchorioinc hematoma		Total
	Present in subchorionic hematoma (+ve)	Absent in subchorionic hematoma (-ve)	
Present in ultrasound	200 (a) True + ve	62 (b) False + ve	262 Total Test Positive (a+b)
Absent in ultrasound	20 (c) Flase - ve	718 (d) True- ve	738 Total Test Negative (c+d)
Total	220 Total Disease + ve (a + c)	780 Total Disease-ve (b+d)	1000 Grand Total (a + b + c+ d)

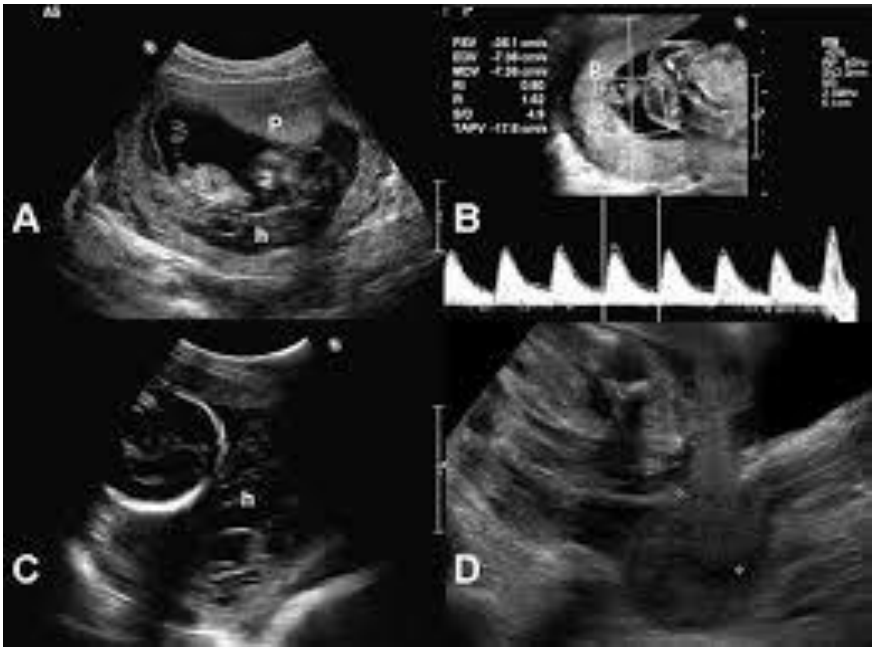
Chi- square : 16.38 (significant)
p- value : 0.003
Sensitivity : 0.91
Specificity : 0.92
Accuracy : 092






Subchorionic Hemorrhage
• Common < 20 wksGA
• Hemorrhage beneath Chorion
– Separates easily from Myometrium
• Caused by:
– Venous Blood
– Marginal Separation of Placenta


2D G50/DR123/FA10/P90/Frq Gen./9.0cm
KJ
BLEED
SAC


A
B
C
D

Marginal subchorionic hematoma is the highest incidence in this series, subaminiotichaematoma is rare.

There is increased incidence of subchorionic hematoma with increase of number of parity, the lowest number was para 1(11.36%), the highest number was para 7(16.8%).

The number of sucbchorionic hematoma increased with the number of gravida, the lowest one was gravida one and the highest one was gravida eight.

There is high incidence for patients with subchorionic hematoma with abortion and the lowest incidence for patients with subchorionic hematoma with still birth.

DISCUSSION

The validity of ultrasound in the diagnosis of subchorionic hematoma in this series is based on the correlation of the ultra sonographic images of subchorionic hematoma with the clinical end results findings of the patients. Subchorionic hematoma was defined as a hypoechoic area behind the fatal membrane just next to the gestational sac.

Slava V. G Gaufberg, *et al*., 2010 state that the ultra sonographic examiner is used widely and is the imaging study of choice and it's the most accurate diagnostic modality in the confirmation of av viable pregnancy during the first trimester [(12)].

Andy, K. 2008 stated that the first trimester vaginal bleeding is a common chief complain in emergency department. It has been shown that emergency residents can diagnose live intrauterine pregnancy with good sensitivity (91%) and specificity (99 %) [(13)].

In this series the cause of vaginal bleeding in the first twenty weeks of pregnancy out of 1000 patients:

1. Regarding subchorionic hematoma, Wheeler, D., 2010 stated that 220 in 1000 that is about (22%) the incidence of subchorionic hemorrhage as high as 20% to 25% have been identified in women with vaginal bleeding [(14)] .

Maso, Gianpaolo; D'Ottavio et al., 2005 stated that the incidence of subchorionic hematoma has wide range between (0.5%) and (22%) mainly associated with the vaginal bleeding [(15)].

In this series the number of subchorionic hematoma was found 220 of 1000 (22%), so it is agree with the above studies.

2. Regarding the threatened abortion without subchorionic hematoma: Ashraf, F. Nabhan, Karman M, Bayoumy, 2008 who study group B about (84%) this statistical difference depends o n different population [(16)].

In this study 718 among 780 patients without subchorionic hematoma and its equals (92%) and this is nearby the above studies.

3. Regarding ectopic pregnancy: Wong, T. W.; CLau, C. Yeung, A. et al., 2001 stated that in the USA, the reported rate of ectopic pregnancy is 16 per 1000 (1.6%). the rate of ectopic pregnancy reported various from (7%) to (13%) [(17)].

Morin, L. and Michiel, C., 2005 stated that the incidence in this circumstance is up to (1%) [(18)].

In this series we found that the number of ectopic pregnancy is (1.2%) so, its agree with the above studies.

4. Regarding Missed abortion: The Ashraf, F. Nabhan, Karman M, Bayoumy, 2008 stated that missed abortion is about (5.15%) [(16)]. in this series it is 40 out of 1000 and it is (4%) missed abortion and it is nearby the above studies.

5. Regarding hydatidiform mole: B. J. Snell, 2009 stated that the incidence of hydatidiform mole has a wide variation with estimation in the united states in 1 in 1500 to 2000 pregnancy (0.06%). Higher rate of hydatidiform mole are reported in Asia countries [(19)].

In this study it is regarded 1% this difference is due to the different in population and could be due to the war in our country, (Table 1).

Regarding the relation of subchorionic hematoma with age distribution out of 220 patients:

Morin, L. and Michiel, C., 2005 stated that the risk of subchorionic hematoma is increased in women older than 35 years and in pregnancy less than 8 weeks [(12)]. Avi Ben-Haroush, et al., 2003 postulated that spontaneous abortion rate was doubled when the separation was large. It is also rose in association with high maternal age (35 years or older) and

bleeding at 8 weeks gestation or less [20]. Maso, Gianpaolo; D'Ottavio, et al., 2005 stated that subchorionic hematoma and maternal age, observe that the spontaneous abortion rate was approximately twice as high for women aged 35 years or older as for younger women [15]. Prosono, 2006 stated that there is increasing risk factor for placental abruption with advanced maternal age [23].

In this study there is increase in incidence of subchorionic hematoma with advanced maternal age and this is agreeing with the above studies. (Table 2).

Regarding types of subchorionic hematoma out of 220 patients in this series:

Trop, I and Levine, D., 2001 stated that regard that marginal subchorionic hematoma is common and subaminiotic hematoma is rare[21]. Jimmie Wong, 2008 stated that marginal subchorionic hematoma is the most common type and subaminiotic hemorrhage is rare[22].

Loi K, Tan Kt, 2006 Stated that marginal subchorionic hematoma is more common and pre-placental hematoma is more uncommon [28]. Wheeler, D., 2010 stated that the peri-sac hematoma that resulted in expulsion of pregnancy that it is (9%) recorded at least one day of bleeding during the first 8 week of pregnancy that resulted in expulsion of a pregnancy was not included in the analysis [14].

In this study marginal subchorionic hematoma is 171 out of 220 and that is (77, 7%), subaminiotic hematoma is 23 out of 220 and that is (10.5%), and peri-sac hematoma is found that it is 26 out of 220 and that is (11.8%).

So, marginal subchorionic hematoma is the most common one, and subaminiotic hematoma is the least one and that is agree with the above studies (Table 3).

Regarding the relationof subchorionic hematoma with number of parity:

Shayna, M. Norman, Anthony O. et al., 2010 stated that women with sub chorionic hemorrhage are more likely to be advanced maternal age, with higher gravidity and parity [24]. author Wheeler, D. 2010 stated that factors associated with abruption placenta: grand multi parity[25].

In this study there is increased incidence of subchorionic hematoma with increase parity and this is agreeing with the above study. (Table 4).

Regarding the relation of subchorionic hematoma with number of gravity: authors Shayna, M. Norman, Anthony O. *et al*., 2010 stated that woman with subchorionic hemorrhage are more likely to be more with advanced maternal age, with higher gravidity and parity [24].

In this study there is increased of subchorionic hematoma with increased number of gravity, and this is agreeing with the above study. (Table5).

Regarding the end result of subchorionic hematoma 220 patients out of 1000 patients with 780 patients without subchorionic hematoma:

authors Nabhan, A.; Bayoumy K. M. and Fateen, B. 2008 [43] state that:

	Cases		Control	
	Number	%	Number	%
Abortion	33 out 81	40.74%	15 out of 95	15.78%
Low birth weight	23 out of 81	28.3%	8 out 95	8.42%
Preterm rupture of membrane	17 out 81	20.9%	10 out 95	10. 5%
Stillbirth	7 out of 81	8.64%	2 out of 95	2.1%

In this study, it is found that:

	Cases		Control	
	Number	%	Number	%
Abortion	92 out 220	41.82%	40 out of 780	5.13%
Low birth weight	61 out of 220	27.72%	51 out 780	6.5%
Preterm rupture of membrane	48 out 220	21.82%	72 out 780	9. 2%
Stillbirth	19 out of 220	8.64%	15 out of 780	1.92%

And this is about to agree with the study above.

Table 8: Comparison between authors findings and this study findings

Points of discussion	Subchorionic hematoma as a cause of vaginal bleeding	Subchorionic hematoma increase with maternal age	Types of Subchorionic hematoma	Subchorionic hematoma increase with increase of No. of Parity	Subchorionic hematoma increase with increase of No. of gravity	End result	Sensitivity, Specificity
Wheeler, D. (2010)	**(22%)**						
Presono (2006)		**Increase risk**					
Jimmie W. (2008)			**Marginal more common**				
Shayna, M. *et al*. (2010)				**Increases with increase of No. of parity**			
Shayna, M. *et al*. (2010)					**Increase with increase of No gravity**		
Nabhan, A. (2008)						**Abortion (40.74%)**	
Andy, K. *et al.* (2008)							**Sensitivity= (91%) Specificity = (99%)**
Present study, (2011)	**(22%)**	**Increase risk**	**(77.7%) marginal more common**	**Increase with increase of No. of parity**	**Increase with increase of No of gravity**	**Abortion (41.82%)**	**Sensitivity = (91%) Specificity = (92%)**

CONCLUSIONS

1. The results of this study indicates that the high resolution abdominal ultrasound has good validity in the diagnosis of subchorionic hematoma.
2. The incidence of sub chorionic hematoma increase with advanced maternal age, parity and gravity.
3. The most common complication of subchorionic hematoma is abortion at first twenty weeks of pregnancy.

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