SUBCHORIONIC HEMATOMA IN THREATENED ABORTION: SONOGRAPHIC EVALUATION AND SIGNIFICANCE

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In a study of 92 women with subchorionic hematoma evaluated with sonographic scan in King Khalid University Hospital, it was found that the mean ages and live births of patients who carried their pregnancies to viability were higher when compared with the patients who aborted. There was a statistically significant association between the gestational age at diagnosis of subchorionic hematoma and the size of the hematoma. There was, however, no statistically significant association found between the gestational age at diagnosis, size and site of the hematoma and the outcome of pregnancy. It was concluded that subchorionic hematoma which appear either in the second trimester, or are larger, or located in the lower uterine segment, may be associated with higher rates of abortion or preterm deliveries. Nevertheless, there is no statistically significant impact of these on the outcome of pregnancy. *Ann Saudi Med 1996;16(6):650-653.*

Vaginal bleeding, one of the features of early pregnancy miscarriage, occurs in up to 25% of all pregnancies,[1-3] although the reported incidence of at least 16% of clinically recognized pregnancies, quoted by Hertig and Livingstone[4] some 50 years ago, is probably still correct today. The natural worry of women with threatened abortion is the loss of their pregnancies, and in about 30% to 50% of cases, that fear may be justifiable.[5,6]

The symptoms and signs of threatened abortion are so variable that the outcome of the pregnancy cannot be reliably predicted by the clinical features at presentation.[7] Thus, various biochemical and biophysical tests have been applied extensively in attempts to improve the accuracy of predicting the outcome of these pregnancies.[8-10] At present there is no single test that can accurately determine outcome of pregnancy after threatened abortions. However, ultrasonic examination has revolutionized clinical practice by providing definite evidence of the viability of a pregnancy as early as six weeks.[1,10,11] One of the sonographic features used in the evaluation of fetal viability in early pregnancy is the presence of subchorionic hematoma, which appears to have gained some prominence lately.[1-3,10-13] Indeed, it has been suggested that this can be used to predict the outcome of pregnancy when correlated with fetal activities such as motion and cardiac function.[1]

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We present here a prospective study of the ultrasonographic evaluation of patients with vaginal bleeding in early and second trimester of pregnancy, to determine the gestational age at diagnosis of, and the size and site of subchorionic hematoma, and to correlate these with pregnancy outcome.

Material and Methods

During the period September 1992 to August 1994, 1082 pregnant patients who had completed between six and 23 weeks of gestation, as based on sonographic estimation of age using the crown-rump length (CRL) or biparietal diameter (BPD), were referred for ultrasonographic assessment in the Ultrasound Department of King Khalid University Hospital (KKUH) in Riyadh. These patients were referred because of vaginal bleeding, occasionally associated with lower abdominal pain. Ultrasonography was performed within 24 hours of clinical assessment, using the 3.5 MHz real-time scanner (Siemens US machine). Of the 1082 patients investigated, 92 women with live fetuses between six and 23 weeks, all with ultrasonically confirmed subchorionic hematoma, were included in the study. Subchorionic hematoma was diagnosed by an echo-free cresentic fluid collection space between the gestation sac and the uterine wall at normal gain settings. All of them were followed up until termination of pregnancy, either in abortion or live birth, and none was known to be on anticoagulant therapy.

When hematoma was identified, the size, as measured by the median value in centimeters, location of hematoma in relation to the gestation sac, and the period of gestation,

were evaluated. All patients with live fetuses with continued fetal heart activity and subchorionic hematoma were re-evaluated at seven- to 10-day intervals, and repeated sonograms were obtained until the subchorionic bleeding resolved and the pregnancy continued, or until the pregnancy ended in abortion.

Comprehensive clinical data, including previous medical and drug history, were collected on all patients who were followed up until spontaneous abortion or delivery occurred. In general, admission into hospital for threatened abortion was confined to those with heavy or prolonged bleeding, and suction evacuation was performed for nonviable fetuses. Clinical follow-up to delivery was arranged for the viable fetuses. The data collected for the study was analyzed using chi-squared test and *t*-test.

Results

During the period of study, 92 women showed ultrasonographic evidence of live fetus and subchorionic hematoma, thus giving an incidence of 8.5% of patients with bleeding in early pregnancy. The overall abortion rate among the 92 patients was 20.7%. For the analysis, the median size of 13.2 cm^2 of hematoma was taken as the cut-off value.

Table 1 shows the demographic characteristics of the two groups of patients with abortions or deliveries, who had subchorionic hematoma in early pregnancy. The mean age of those who aborted (26.7 $\pm$ 5.8 years) was slightly lower that the mean age (28.0 $\pm$ 4.8 years) of those who continued with their pregnancies to viability. The number of previous live births was lower in those whose pregnancies ended in abortions (2.2 $\pm$ 1.9), compared with those who carried their pregnancies to viability (3.1 $\pm$ 2.6). A history of previous abortions was higher among the former (1.1 $\pm$ 0.9) compared with the latter (0.6 $\pm$ 0.8). The size of the subchorionic hematoma was also slightly larger among those who aborted (17.6 $\pm$ 8.5). However, the differences between the two groups in relation to the different variables were not statistically significant ($P>0.05$).

The gestational age when the patients presented in hospital in relation to the size of subchorionic hematoma is shown in Table 2. While 32 (50.8%) of the patients who presented early ($\leq$12 weeks) had small hematoma, 24 (82.8%) of those who presented late ($\geq$13 weeks) showed evidence of larger hematoma. The association between the size of hematoma and the period of gestation was statistically significant (<0.01), and the two factors were also positively correlated (r=0.309; P=0.0028).

Table 3 shows the outcome of the pregnancy in relation to different hematoma variables. There were 12 (19.0%) abortions among the 63 patients who presented with hematoma early ($\leq$12 weeks), compared with seven (24.1%) among the 29 patients who presented late ($\geq$13 weeks). Also, two (3.2%) of the patients who presented early ended in preterm labor, compared with two (6.9%) among those who presented later. However, the differences in the various groups were not statistically significant ($P>0.05$).

When the outcome of the pregnancy was assessed in relation to the size of the hematoma, it was observed that seven (18.9%) of the 37 patients with small hematoma ($\leq$ 13.1 cm^2) aborted, compared with 12 (21.8%) of the 55 patients with large hematoma ($\geq$13.2 cm^2). The difference in abortion rate did not show any statistical difference ($P>0.05$).

Furthermore, the outcome of the pregnancy in relation to the site of the hematoma in the uterus showed that only one (3.3%) of the 30 patients with hematoma in the upper segment had preterm labor, and three (4.8%) of the 62 patients with hematoma in the lower segment ended in preterm labor. The incidence of abortion (20% and 21% respectively) and viable pregnancies (79% and 80% respectively) were about equal in relation to the sites of implantation. There was no statistically significant difference in the outcome of pregnancy in relation to the site of the hematoma ($P>0.05$).

Discussion

The incidence of subchorionic hematoma in this study may be unusually low. However, with a finding of 8.5% among the patients with threatened abortion screened by sonography, the incidence of hematoma in this study is within the range of those of other studies.[1-3,10,14] The low incidence in this study is probably because a few of the pregnancies screened were slightly less than 10 weeks' gestation, when hematoma formation may be more difficult to detect, since it has been shown that subchorionic hematoma is a frequent phenomenon in patients with threatened abortion.[2]

The overall abortion rate of 20.7% in this study is similar to that found by Goldstein et al.[1] and Jouppila,[13] but much higher than those reported by others in patients with threatened abortion.[2,4,10,15,16] On the other hand, it is much less than that found by Abu-Yousef et al.[6] This wide variation in the abortion rates, from 0.0% to 43.8%, can best be explained in part by the rather small numbers of patients in most of these studies, some of which may also have an overrepresentation of high-risk pregnancies. However, variation in populations studied may also be a major factor in the divergent findings.

There was not much difference in the demographic characteristics of the patients who eventually aborted and those who continued with their pregnancies, except that

TABLE 1. *Demographic characteristics of women with subchorionic hematoma.*

	Abortions (n=19)		Deliveries (n=73)		
	Mean±SD	Range	Mean± SD	Range	*P*-value
Age (years)	26.7±5.8	19-46	28.0±4.8	18-39	0.62
Previous live births	2.2±1.9	0-6	3.1±2.6	0-10	0.11
Previous abortions	1.1±0.9	0-3	0.6±0.8	0-3	0.051
Gestation age at 1st bleed (wks)	11.9±4.3	6-23	11.5±2.8	6-23	0.70
Size of hematoma on USS (cm^2)	17.6±8.5	6.2-29.3	17.0±14.1	4.4-59.6	0.80
Gestation age abortion (weeks)	21.8±3.3	16-23	—	—	—
Gestation age delivery (weeks)	—	—	38.6±2.8	26-41	—
Birth weight of babies (grams)	486.0± 136.2	300-520	3079.6± 755.2	480-4350	—

USS=ultrasound scan.

TABLE 2. *Gestation age at presentation in hospital in relation to the size of subchorionic hematoma.*

Gestation age (weeks)	Small (≤13.1 cm^2)	Large (≥13.2 cm^2)	Total
≤12	32	31	63
13-16	4	18	22
≥17	1	6	7
Total	37	55	92

Chi-squared=9.3319; df=2; *P*=0.0094.

TABLE 3. *Outcome of pregnancy in relation to different hematoma variables.*

	Abortion (n=19)	Viable (n=73)	*P*-value
Gestation age (wks) at diagnosis of hematoma			
≤12	12 (19.0%)	51 (81.0%)	0.58
≥13	7 (24.1%)	22 (75.9%)	
Site of hematoma (cm^2)			
Small (≤13.1)	7 (18.9%)	30 (81.1%)	0.74
Large (≥13.2)	12 (21.8%)	43 (78.2%)	
Site of hematoma			
Upper segment	6 (20.0%)	24 (80.0%)	0.91
Lower segment	13 (21.0%)	49 (79.0%)	

the mean of previous history of abortions (1.1 ± 0.9) was higher among those who aborted, compared with 0.6 ± 0.8 among the other group. On the other hand, previous history of live births was higher (3.2 ± 2.6) among those who continued with their pregnancies compared with those who aborted (2.2 ± 1.9). This can be explained on the basis that the risk of abortion in a given pregnancy rises directly with the number of previous abortions. [17-19]

The median value of 13.2 cm^2 was used as the cut-off point for small and large hematoma size in this study because of the positively skewed distribution (1.6171) of the data, since the median would be the appropriate measure of central tendency for this set of data on hematoma areas. Using this median value of 13.2 cm^2 as the cut-off value for small and large size hematoma, it was observed that large hematomas (≥13.2 cm^2) tended to occur more significantly in the second trimester (*P*=0.0094), even when there was a higher incidence of subchorionic hematoma (68.8%) in the first trimester.

As far as we are aware, the only other study [20] in which the incidence of subchorionic hematoma during the two trimesters was addressed, showed equal distribution in both the first and second trimesters, although patients presenting in the second trimester were also shown to have larger subchorionic hematomas. Stabile et al., [10] who only studied patients in the first trimester, also found rather small hematomas in their study population. It is possible that larger sizes of hematomas in the first trimester may have ended in first trimester abortions which go unrecognized,[3] which would account for these differences.

There was no statistically significant association between the period of gestation at diagnosis, the size and site of hematoma, and the outcome of pregnancy in this study. However, hematomas which appear in the second trimester, which are larger and occur in the lower segment, tended to end in higher abortion or preterm deliveries in this study. These findings have similarly been demonstrated by other studies. [3,10,20,21] Indeed, studies have shown that the impact of subchorionic hematoma on pregnancy depends in large measure on the amount of bleeding and the gestational age of the gravida. [11,20,22]

The finding of subchorionic hematoma in early pregnancy may not be all that significant, since the presence of hematoma does not necessarily uniformly imply poor outcome. It has been said that it may likely represent an incidental finding, therefore, and when small and asymptomatic, may be of no clinical significance. [2,3] However, larger hematomas are more likely to be detected later in pregnancy, and may be associated with a poorer outcome, such as late abortions or preterm delivery. [20,23]

The etiology of subchorionic hematoma is worth discussing, since this is also unclear. Subchorionic hematoma has been shown not only in patients with threatened abortion, but also in patients with bleeding disorders,[24] patients with the presence of auto-antibodies,[25,26,27] as well as patients receiving anti-coagulants.[28] Indeed, vasculopathies associated with certain disease states such as hypertension have been suggested as being able to make placental vessels more fragile, and therefore at greater risk of hemorrhage. There is no doubt, therefore, that more prospective studies, preferably with controls, would be required to address not only the etiopathology of subchorionic hematoma, but also the natural course of pregnancy following the hemorrhage.

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