

PROGNOSTIC IMPORTANCE OF SUBCHORIONIC HEMATOMA IN THREATENED ABORTION

(Received 16 January, 1995)

A. Karateke, M.D.* / S. Tuğrul, M.D.
C. Özarpaç, M.D.** / A. Gürbüz, M.D.****

* Associate Professor, Department of Obstetrics and Gynecology, Zeynep Kamil Maternity Hospital, Istanbul, Turkey

** Specialist, Department of Obstetrics and Gynecology, Zeynep Kamil Maternity Hospital, Istanbul, Turkey

ABSTRACT

Objective: This study was devised to determine the value of sonographically detected subchorionic hematoma in the prediction of the outcomes of threatened abortion.

Methods: Thirty-six cases of threatened abortion with subchorionic hematoma made up the study group and the control group consisted of 20 cases of threatened abortion. The patients were followed prospectively until 20 weeks of gestations.

Results: The difference between the incidence of abortion in two groups was not significant ($p=0.4955$). In the study group, there was not any significant difference in volumes of subchorionic hematoma between the cases resulting in abortion and the cases displaying a normal pregnancy course ($p=0.1983$). Relative volume of subchorionic hematoma (subchorionic hematoma volume/gestational sac volume) in the cases displaying a normal pregnancy course and those resulting in abortion was $20.83\% \pm 8.1\%$ and $32.25\% \pm 8.8\%$, respectively, and this difference was found to be significant ($p=0.0015$).

Conclusion: It is suggested that in the cases of threatened abortion neither the presence nor the volume of subchorionic hematoma was important in determining the prognosis of cases, though the relative volume of subchorionic hematoma was found to be a better prognostic parameter predicting the outcome of threatened abortions.

Key words: Threatened abortion, Subchorionic hematoma

INTRODUCTION

Threatened abortion is defined as uterine bleeding that occurs during the first half of an intrauterine live pregnancy (1,2). This complication is encountered in 20%-25% of pregnancies (3,4). Ultrasonography is a valuable diagnostic tool in the evaluation of first trimester bleeding and provides information about the size, shape and contour of gestational sac, fetal movements and cardiac activity, and the presence of subchorionic hematoma.

Recently, several parameters have been under investigation to determine the prognosis of threatened abortion cases, most frequently used ones are BHCG, Schwangerschaft protein, placental protein 5, placental protein 14, relaxin and CA-125 (5). In addition to these parameters, the presence of subchorionic hematoma detected by ultrasonographic examination has been shown to be a significant parameter for the prognosis of threatened abortion (6,7). Subchorionic hematoma is produced by the separation of chorion layer from myometrium bleeding into the extrachorionic space and is detected by a hypoechoic crescent like image in ultrasonographic examination. The image of hematoma is either hypoechoic or mixed echoic depending on the age of the thrombus organisation. The significance of the presence of subchorionic hematoma in the prognosis and outcome of threatened abortion cases has been reported (6,7).

The incidence of subchorionic hematoma detected by ultrasound in threatened abortion cases has been reported to be in a wide range from 11% to 62%, and considered as a poor prognostic factor for the outcome of early pregnancy (7-9).

In our study, the absolute and relative volumes (the ratio of volumes of subchorionic hematoma and gestational sac) of the subchorionic hematoma were studied ultrasonographically to evaluate the predictivity of the subchorionic hematoma for the outcome of threatened abortion cases.

MATERIALS AND METHODS

This study was carried on from May 1 1992 to February 28 1993 in Zeynep Kamil Maternity and Children Hospital. The study group of 7-20 weeks of gestational age comprised 36 threatened abortion cases presenting with vaginal bleeding and a single, live fetus in a gestational sac with subchorionic hematoma detected ultrasonographically.

Randomly selected 20 cases of threatened abortion with single, live fetus and without subchorionic hematoma detected ultrasonographically made up the control group.

The history of each patient including maternal age, reproductive history (number of gravida, parity, abortion, D&C) gestational age related to the last menstrual date, the duration of vaginal bleeding and the presence of accompanying pain was recorded. All the cases of the study and control group were ultrasonographically evaluated by HITACHI-EUB 315 3.5 MHz convex probe in the last 48 hours following vaginal bleeding. The size, contour, content and volume of the gestational sac; fetal movements and cardiac activity; crown rump length and biparietal diameter measurements and the presence of subchorionic hematoma and its volume were determined and recorded by using the ellipsoid formula: volume of subchorionic hematoma = length (cm) x width (cm) x height (cm) x 0.5 was calculated (3).

Gestational sac volume = $4/3 (d/2)^3$ formula was used to calculate the gestational sac volume where "d" was gestational sac diameter.

Relative volume of subchorionic hematoma = volume of subchorionic hematoma / volume of gestational sac.

All cases of the study and control groups were hospitalized until the vaginal bleeding ceased or after the abortion occurred. The patients whose vaginal bleeding ceased were discharged with the advice of bed rest and avoidance of sexual intercourse. These cases were followed as outpatient until 20 weeks of gestational age.

Statistical analysis was done by students-t test, correlation matrix test using the Microsta (Microsoft USA) computer program.

RESULTS

The mean maternal age was 23.77±4.02 years, the mean gravidity 2.27±1.27, the mean parity 1.11±0.37 and the mean number of abortions was 0.16±0.37 in the study group. The corresponding values were 23.15±3.13, 1.8±0.8, 0.8±0.89 and 0.1±0.25 in the control group, respectively. The mean gestational ages related to LMD and CRL measurements were 11.8 ± 2.51 weeks and 11.27 ± 2.89 weeks, respectively. The corresponding values were 11.6 ± 2.01 and 11.2 ± 2.21 in the control group, respectively.

The maternal age, and number of pregnancies, deliveries and abortions and the mean gestational ages related to LMP and CRL were statistically similar both in the study and control groups. (Table I). Pain was present in 63.8% and 80% of the study and control groups, respectively. When compared, the duration of vaginal bleeding until it ceased spontaneously was 2.3±1.2 days and 3.5±1.6 days in the study and control groups, respectively. The difference between the durations of vaginal bleeding of the two groups was found to be statistically significant ($p<0.05$).

As a result of serial ultrasonographic examinations of the 36 cases of the study group without considering the pregnancy prognosis, the initially detected volume of subchorionic hematoma was 9.58±13.49 ml and was 6.30±8.34 ml one week later. The volume of subchorionic hematoma was found to decline in ultrasonographic examination one week later but this

Table I: General specifications of cases

	<u>Study group</u>	<u>Control group</u>	<u>P</u>
Maternal age	23.77 ± 4.02 (17-31)	23.15 ± 3.13 (17-29)	0.26
Gravidity	2.27 ± 1.27 (1-7)	1.8 ± 0.8 (1-4)	0.054
Parity	1.11 ± 1.18 (0-5)	0.8 ± 0.89 (0-3)	0.13
Gestational weeks (LMP)	11.18 ± 2.51 (7-15.5)	11.6 ± 2.01 (9-16.5)	0.24
Gestational weeks (CRL)	11.27 ± 2.89 (7-17)	11.2 ± 2.21 (8-16.5)	0.45
Abortion history	0.16 ± 0.37 (0-1)	0.1 ± 0.25 (0-1)	0.07

reduction in volume was not statistically significant ($p=0.1097$).

Six of 36 cases (16.6%) in the study group resulted in pregnancy loss whereas 30 cases were followed without any problem until 20 weeks of gestational age. In the control group, two of 20 cases (10%) resulted in abortion, the remaining 18 cases were followed until 20 weeks without any problem. The pregnancy outcomes of the study and control groups did not show any statistically significant difference. ($p=0.4945$)

The study group was analysed by dividing it into two subgroups related to their pregnancy outcomes. The volume of subchorionic hematoma detected in the initial ultrasound examination was 5.26 ± 4.43 ml and 10.44 ± 14.55 ml in six cases with abortion, in thirty cases without abortion respectively. The difference between the volumes of subchorionic hematoma of the two subgroups was not statistically significant. ($p=0.1993$)

Since two of six cases resulting in abortion were aborted during the fourth and fifth days after the initial examination, 34 cases had a second ultrasound examination. The volumes of subchorionic hematoma detected in the second ultrasound examination were 4.38 ± 4.03 ml and 6.98 ± 8.94 ml in the cases with abortion or without abortion, respectively; and the difference between these two groups was not statistically significant ($p=0.3410$).

The cases of the study group were evaluated with relation to their relative volume of subchorionic hematoma, (subchorionic hematoma volume / volume of gestational sac) which is considered to be a significant prognostic factor of pregnancy.

In the initial ultrasound examination of the study group, the relative volumes of subchorionic hematoma of the cases resulting in abortion were $32.50\pm 8.8\%$ and $20.83\pm 8.1\%$, respectively. The difference between these two groups was statistically significant. ($p=0.0015$). When 30% was chosen as a cut of ratio for the relative volume of subchorionic hematoma, the positive predictivity of relative volume for subsequent abortion was 83.8%, the negative predictivity, sensitivity, spesificity were found to be 90.3%, 71.4%, 90.6%, respectively.

DISCUSSION

Approximately 20%-25% of all pregnancies are complicated by threatened abortion. In our study six of 36 cases of the study group (16.6%) and two of 20 cases of the control group (10%) resulted in abortion whereas 48 cases were followed up without any

problem until 20 weeks of gestational age. Totally, eight of 56 cases of threatened abortion including the study and control groups resulted in abortion and the abortion rate was found to be 14.2% in our study.

In cases of threatened abortion several parameters such as BHCG, Schwangerschaft protein, placental protein 5, placental protein 14, relaxin, CA 125 have been used to determine the prognosis of pregnancy. In addition to these parameters, ultrasonographically detected subchorionic hematoma has been shown to be a significant prognostic factor in threatened abortion cases (10).

Subchorionic hematoma is produced because of hemorrhage into the extrachorionic space developed by separation of chorion layer from the myometrium. Ultrasonographically, subchorionic hematoma is detected by the image of a detached chorionic membrane from the myometrium and an extrachorionic fluid collection in the crescent form. This image, dependent on the organization of thrombus in the hematoma area, will be seen as a mixed echo or a cystic echo of the thrombus and is organized or unorganized, respectively (11-14). Subchorionic hematoma is a significant factor affecting the prognosis of pregnancy in threatened abortion cases (6,7). The incidence of subchorionic hematoma detected ultrasonographically in cases of threatened abortion varies between 11% and 62% (8). Pedersen and Mantoni (11) have reported the incidence of subchorionic hematoma as 62 of 342 cases of threatened abortion between 9-20 weeks of gestational age- Goldstein et al. as 10 out of 50 (20%) cases (6). In our study, since the study group comprised of selectively chosen cases with subchorionic hematoma, we could not determine the incidence of subchorionic hematoma in the cases of threatened abortion.

Goldstein et al (6) have found the volume of subchorionic hematoma as 40-160 ml in 10 cases out of 50 cases of threatened abortion between 8-20 weeks of gestation. Forty cases of threatened abortion without subchorionic hematoma were followed up to term whereas two out of 10 cases with subchorionic hematoma resulted in pregnancy loss 21 and 30 days after the initial ultrasound examination. In the remaining 8 cases, the subchorionic hematoma area was resolved in 4-7 weeks and pregnancies reached term. In their study, statistically no significant relation was determined between the volume of subchorionic hematoma and the prognosis of pregnancy (6).

Pedersen et al (11) have found the incidence of subchorionic hematoma to be 62 out of 342 cases of threatened abortion (18%) and the mean volume 20

ml (2-150ml). In their study, they found 7 of 62 cases with subchorionic hematoma (11%), and 28 of 280 cases without hematoma (10%), to result in abortion. This study did not reveal any significant correlation between the volume of subchorionic hematoma and the prognosis of pregnancy.

In our study, the mean volumes of subchorionic hematoma detected in the initial and one week after ultrasound examination were 9.58 \pm 13.49 (0.5-25.52)ml and 6.30 \pm 8.34(1.4-4.35)ml, respectively. The reduction detected in the volume of subchorionic hematoma was not found to be statistically significant. (p=0.1097). In the study group, 6 of 36 cases (16.6%) with subchorionic hematoma where as 2 of 20 cases (10%) without subchorionic hematoma resulted in abortion. The difference was not statistically significant. (p=0.4945). The mean volume of subchorionic hematoma of the cases resulting in abortion was 5.26 \pm 4.43 ml in the initial ultrasound examination whereas the corresponding value was 10.44 \pm 14.15 ml in the cases not resulting in abortion. (n=30). The difference was not statistically significant (p=0.1993). There was no statistically significant correlation between the rate of spontaneous abortions of the study and control groups and between the volume of subchorionic hematoma and the rate of spontaneous abortion. In the cases with progression of pregnancy, the resolution of the subchorionic hematoma in 2-7 weeks was determined. Our findings were similar to the findings of Goldstein's and Pedersen's studies (6,11).

Abu-Yousef et al (7) have reported seven of 21 cases (33.3%) of threatened abortion with subchorionic hematoma resulting in abortion before 20 weeks of gestation. In this study, the significance of the presence and the volume of subchorionic hematoma in determining the prognosis of pregnancy has been emphasized. These findings did not agree with our findings.

Sauerbrei et al (12) have accepted the relative volume (volume of subchorionic hematoma / gestational sac) >40% as a pathologic value and emphasized on the significance of this parameter in the prognosis of pregnancy. In our study, the mean relative volumes of the cases with subchorionic hematoma resulting in abortion and not resulting in abortion were 32.50 \pm 8.8% (24.8%-50.4%) and 20.83 \pm 8.1% (10.2%-50.6%), respectively. The difference between the relative volumes were found to be statistically significant (p=0.0015). When 30% was considered as the cutoff value, four of 6 cases with the relative volume >30% resulted in abortion and two cases progressed up to 20 weeks of gestational age whereas 2 of 30 cases with relative volume <30% resulted in abortion and 28 cases were

followed up without any problem to 20 weeks of gestational age.

Considering these data, when "30%" is admitted as the cutoff value of the relative volume positive predictivity, negative predictivity, sensitivity and specificity were found to be 83.3%, 90.3%, 71.4%, 90.6%, respectively. Our results were in accordance with Sauerbrei's study.

As a conclusion, the presence and volume of the subchorionic hematoma was not alone adequate for determining the prognosis of pregnancy but the relative volume of subchorionic hematoma >30% considered as the cutoff value appeared to be a better prognostic parameter with 71.4% sensitivity and 90.6% spesificity for the prediction of the pregnancy outcome in threatened abortion. However the small study group of the present study was a disadvantage. Future studies with large groups will enlighten the predictivity of the volume of subchorionic hematoma for the outcome of threatened abortions.

REFERENCES

1. Coleman BG, Arger PH. *Ultrasound in early pregnancy complications. Clin Obstet Gynecol 1988;31(1):3-18.*
2. Duff G. *Prognosis in threatened abortion: A comparison between predictions made by sonor. urinary hormone assays and clinical judgement. Br J Obstet Gynaecol 1975;82:858-863.*
3. Fleisher AC, Pennell RG, Sacks GA, Kepple DM, Davies J. *Sonography in early intra uterine pregnancy emphasizing transvaginal scanning. In: Fleisher AC ed. The principles and practice of ultrasonography in obstetrics and gynecology. Connecticut: Prentice-Hall International Inc, 1991:39-55.*
4. Mantoni M. *Ultrasound signs in threatened abortion and their prognostic significance. Obstet Gynecol 1985;65:471-475*
5. Witt BR, Walf CG, Wainwright CJ, Johnston PD, Thornegcrayt IH. *Relaxin, CA-125, progesteron, estradiol, Schwangerschaft protein and human chorionic gonadotropin as predictors of outcome in threatened pregnancies. Fertil Steril 1990;53:1029-1036.*
6. Goldstein SR, Subramanyam BR, Raghaven BN, Harii SC, Hilton S. *Subchorionic bleeding in threatened abortion; Sonographic findings and significance. AJR 1983;141:975-978.*
7. Abu Yousef MM, Bleicher JC, Williamson RA, Weiner CP. *Subchorionic hemorrhage in threatened abortion. AJR 1987; 149:737-740.*
8. Baxi LV, Pearlstone MM. *Subchorionic hematomas and the presence of otoantibodies. Am J Obstet Gynecol 1991;165:1423-1424.*
9. Chong XL, Murphy A. *Antinuclear antibodies in sera of patients with recurrent pregnancy*

- wastage. *Am J Obstet Gynecol* 1990;163:1493-1497.
10. Anderson G. Management of threatened abortion real time sonography. *Obstet Gynecol* 1980;55:259-263.
 11. Pedersen JR, Mantoni M. Prevalence and significance of subchorionic hemorrhage in threatened abortion. *AJR* 1989;154:535-541.
 12. Sauerbrei EE, Phan DH. Placental abruption and subchorionic hemorrhage in the first half of pregnancy- Ultrasonographic appearance and clinical outcome. *Radiology* 1986;160:109-112.
 13. Nyberg DA, Cyr DR, Mack LA, Nilson DA, Schuman WP. Sonographic spectrum of placental abruption. *AJR* 1987;148:161-164.
 14. Nyberg DA, Mack LA, Benedetti TJ, Cyr DR, Schuman WP. Placental abruption and placental hemorrhage; Correlation of sonographic finding with fetal outcome. *Radiology* 1987;164:357-361.