

ORIGINAL ARTICLE

ASSOCIATION OF SUBCHORIONIC HEMATOMA WITH PRETERM LABOUR IN PATIENTS WITH THREATENED ABORTION

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Background: One of the frequent obstetric complications in first trimester is vaginal bleeding. It has an incidence of 16%-25%. Subchorionic haemorrhage is the most common cause of first trimester miscarriage associated with vaginal bleeding. The objective of the study was to determine the association of subchorionic hematoma (SCH) with preterm labour in pregnant females with threatened abortion. **Methods:** A Cohort Study was designed and conducted in the Obstetrics and Gynaecology Department, Zanana hospital, Dera Ismail Khan (D.I. Khan). A sample size of 418 subjects was equally divided into two equal groups. Non-probability consecutive sampling was used for collection of samples. Pregnant women presenting with sub chorionic hematoma were considered as cases while pregnant women without sub chorionic hematoma were considered as controls. The diagnosis of sub chorionic haemorrhage was established by ultrasound. Data was analysed by SPSS version 22.0 for description, i.e., frequencies and percentages were calculated for categorical variables and for continuous variables, mean±standard deviation (±SD) was calculated. To compare preterm labour in both groups Chi-square test was applied and $p \leq 0.05$ was taken as significant. Stratification was done with regard to age, gestational age, parity, history of hypertension, and weight to see the effect of these variables on preterm labour. Chi-square test was used for post stratification for both groups and $p \leq 0.05$ was considered statistically significant and relative risk was calculated. **Results:** The age range was from 18–40 years in group A with a mean age of 29.08 ± 2.88 years while it was 28.41 ± 2.94 years in group B. Mean gestational age was 13.99 ± 3.15 weeks in group A and 11.42 ± 3.37 weeks in group B. Mean parity was 0.91 ± 1.14 in group A and 0.78 ± 1.09 in group B respectively. Mean weight of subjects in group A was 68.31 ± 10.27 and 67.55 ± 10.09 Kg in group B. Majority of the patients were of 18–30 years in both groups (group A; 78.5% and group B; 78.9%). History of hypertension was noted in 33% in group A and 12.9% in group B. In group A, preterm labour was seen in 40 (19.1%) patients as compared to 61 (29.2%) patients in group B, ($p=0.02$, R.R=0.65). **Conclusion:** Subchorionic hematoma in patients with threatened abortion during the first half of the pregnancy may not increase the risk of preterm labour.

Keywords: Threatened abortion; Sub chorionic hematoma; Preterm labour

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INTRODUCTION

Subchorionic hematoma is a collection of blood between membranes of placenta and chorion in the subchorial area leading to subchorionic haemorrhage. This obstetric problem usually occurs in the early pregnancy period during first trimester. The patient usually presents with vaginal bleeding. In around 18% of all cases presenting with vaginal bleeding in first trimester subchorionic hematoma is the imperative finding detected by ultrasound scan. On ultrasound scan, it shows normal gestational sac near anechoic or hypoechoic area. This can be of inconsistent size and usually have shape of a half moon. Improvement or worsening of the condition can be observed by regular follow up on ultrasound. The sonographic findings are required to be correlated with clinical symptoms like bleeding and pelvic pain so clinical examination is necessary for the evaluation.¹ There is greater variation

in prevalence of subchorionic hematomas reported in past studies. Its incidence varies from 0.46% to a very high value of 39.5%.² Threatened abortion can be described as intrauterine bleeding with or without the presence of cervical dilation or tenderness in early pregnancy period. Mostly this bleeding is not associated with pain and has very less possibility of deterioration but it causes anxiety about outcome of pregnancy. In early pregnancy the four main sources of non-traumatic bleeding are ectopic pregnancy, miscarriage which may be threatened, inevitable, incomplete or complete, implantation of pregnancy and any pathology in uterus cervix or vagina such as inflammation/infection, polyps and trophoblastic disease.³

Placental dysfunction can be one of the mechanisms involved in causation of threatened abortion leading to a number of complications later in pregnancy such as preeclampsia, placenta previa

intrauterine growth restriction (IUGR), placental abruption, preterm labour and perinatal mortality. Other than routine antenatal visits, bleeding in first trimester is the most important reason for the consultation. The end result may be termination or continuation of pregnancy depending upon cause of bleeding and other maternal factors along with factors associated with conceptus. The pregnancies after first trimester bleeding may also progress to the period of survival and beyond. Apart from SCH the ultrasound finding in patients with first trimester bleeding may show presence of retroplacental hematoma. The rate of consequent pregnancy failure is higher if SCH is detected early in pregnancy.⁴ SCH often decreases in size especially if it is already small in size or of moderate size. Large hematoma removing at least 30–40% of placenta away from endometrium may increase in size which further compresses the gestational sac with consequent spontaneous miscarriage.⁵ Risk factors contributing to adverse pregnancy outcomes in SCH include diagnosis at an early gestational age (before 9 weeks), large size hematoma, fundal or retroplacental location, and severity of symptoms. There are rare chances of persistent SCH but it is associated with a higher prevalence of chorioamnionitis.⁶

The accurate pathophysiology of SCH is still unclear. However poor placentation is believed to be the underlying cause of SCH.^{7,8} Poor placentation can damage angiogenesis which results in the formation of weak vessels that easily tear.^{3,6} In SCH, it is suggested that the low-pressure bleeding occurs because of tearing of marginal uteroplacental veins. A crescentic hematoma is formed between the chorion and the uterine wall due to tracking of blood around the gestational sac.⁹ A recent Japanese study is in favour of the theory that poor placentation is the cause of SCH. This study also found that females having risk factors for poor placentation and those who have conceived through in vitro fertilization particularly using a frozen-thawed embryo transfer, has increased incidence of SCH.¹⁰ Threatened miscarriage is an imperative obstetric condition in predicting both the maternal and foetal outcomes in late pregnancy. Obstetric history of mother related to her previous pregnancies should be asked. Therefore, proper antenatal care should be given to such high-risk pregnancies.¹¹

The objective of this study was to investigate the association of subchorionic hematoma with preterm labour in pregnant females with first trimester threatened abortion.

MATERIAL AND METHODS

A Cohort study was designed which was conducted in Obstetrics and Gynaecology Department, Zanana hospital/Gomal Medical College, D. I. Khan. The duration of study was six months and was conducted from 15th March to 10th September 2018. World Health

Organization (WHO) software for sample size determination in health studies was used to calculate the sample size. Sample size was calculated with confidence level 95% and alpha 5% (two-sided) with power=80% by using expected proportion (preterm labour) in population 1=16.1%⁷ and least expected proportion (preterm labour) in population 2=7.3%¹². Sample size thus calculated is 418 (209 cases and control each). Non-probability consecutive sampling was used for collection of samples. Pregnant women presenting with threatened abortion, singleton pregnancy between 6–18 weeks of gestation and SCH confirmed on ultrasound were considered as cases or group A. While, pregnant women presenting with threatened abortion, singleton pregnancy between 6–18 weeks of gestation without SCH were considered as controls or group B as per our operational definitions. Period of gestation was calculated from first day of last menstrual period or by antenatal ultrasound scan. The subjects with pregnancy after assisted reproductive technologies on medical record, multiple pregnancies on ultrasound, congenital anomalies on ultrasound, and recurrent pregnancy loss on medical record were excluded from the research.

After approval from Ethical Research Board of Zanana hospital /Gomal medical college and research department of CPSP, 418 patients fulfilling inclusion criteria was registered through ward admissions. Informed consent was taken. Socio demographic information like name, age, gestational age, and parity was recorded. At the time of inclusion, women were divided in two equal groups. 209 as cases (group A) and 209 as control (group B). All the subjects were administered progesterone treatment prophylactically in oral, vaginal or intramuscular forms as per protocol under supervision of consultant gynaecologist of 3 years post fellowship experience. All patients were followed up till delivery and preterm labour was noted as the presence of uterine contractions at less than 37 weeks gestation with dilation of the cervix of 2cm at presentation and assessed by vaginal examination from both groups by researcher herself on especially designed proforma.¹³

Data was analysed by statistical analysis program (IBM-SPSS version 22.0) for description, i.e., frequencies and percentages were calculated for categorical variables and for continuous variables, mean \pm standard deviation (\pm SD) was calculated. To compare preterm labour in both groups Chi-square test was applied and $p \leq 0.05$ was taken as significant. Stratification was done with regard to age, gestational age, parity, history of hypertension, and weight to see the effect of these variables on preterm labour. Chi-square test was used for post stratification for both groups and $p \leq 0.05$ was considered statistically significant and relative risk was calculated.

RESULTS

Descriptive statistics of mean±SD of age (years), gestational age (weeks) parity, weight (kg) in cases and controls are presented. Age range in this study was from 18–40 years with mean±SD age of cases was 29.08±2.88 years while 28.41±2.94 years in controls. Mean±SD gestational age was 13.99±3.15 weeks in cases (group A) and 11.42±3.37 weeks in controls (group B). Mean parity was 0.91±1.14 in group A and

0.78±1.09 in group B. Mean weight was 68.31±10.27 kg in group A and 67.55±10.09 kg in group B (Table-1). Majority of the patients were of 18–30 years in both groups: group A (78.5%) and in group B (78.9%). History of hypertension was seen in 33% in group A and 12.9% in group B. In group A, preterm labour was seen in 40 (19.1%) patients as compared to 61 (29.2%) patients in group B, ($p=0.016$, R.R=0.65) (Table-2).

Table-1: Descriptive statistics of mean±SD of age (years), gestational age (weeks), parity, weight (kg) in both cases and controls

Demographics	Group A (Cases) n=209 Mean±SD	Group B (Controls) n=209 Mean±SD
1. Age (years)	29.08±2.88	28.41±2.94
2. Gestational age (weeks)	13.99±3.15	11.42±3.37
3. Parity	0.91±1.14	0.78±1.09
4. Weight (Kg)	68.31±10.27	67.55±10.09

Table-2: Frequency and percentage of patients according to age, history of hypertension, and preterm labour in both groups

Variables	Cases (Group A) n=209	Controls (Group B) n=209
Age (Years)		
18–30	164 (78.5%)	165 (78.9%)
31–40	45 (21.5%)	44 (21.1%)
History of Hypertension		
Yes	69 (33%)	27 (12.9%)
No	140 (67%)	182 (87.1%)
Preterm labour		
Yes	40 (19.1%)	61 (29.2%)
No	169 (80.9%)	148 (70.8%)
Total	209 (100%)	209 (100%)

Table-3: Stratification of preterm labour with respect to age and gestational age in both groups

Groups	Age 18–30 years		p-value R.R
	Yes	No	
A	31 (18.9%)	133 (81.1%)	0.07
B	45 (27.3%)	120 (72.7%)	
Age of Subjects (31–40 years)			
Groups	Yes	No	p-value R.R
A	9 (20%)	36 (80%)	
B	16 (36.4%)	28 (63.6%)	0.55
Gestational Age (6–12 weeks)			
Groups	Yes	No	p-value R.R
A	14 (21.2%)	52 (78.8%)	
B	35 (29.2%)	85 (70.8%)	3.81
Gestational Age (13–18 weeks)			
Groups	Yes	No	p-value R.R
A	26 (18.2%)	117 (81.8%)	
B	26 (29.2%)	63 (70.8%)	0.62

DISCUSSION

The results of present study revealed that the risk of preterm labour may not increase in the presence of SCH in patients with threatened abortion during the first half of pregnancy as it was in 40 (19.1%) females with sub chorionic hematoma as compared to 61 (29.2%) females in control group ($p=0.016$, R.R=0.65). This is in accordance with the case control study carried out by Shafaq Hanif *et*

al in 2019 in which they divided subjects into two groups of cases with sub chorionic hematoma and controls without findings of hematoma. There was no relationship of subchorionic hematoma with pregnancy complications like pregnancy induced hypertension (PIH), intrauterine growth restriction (IUGR), and preterm labour except preeclampsia rate that was raised in controls as compared to cases (15.2% vs. 4.5%).¹⁴ Whereas Hashem *et al* observed

an increase in rate of miscarriage (20%, $p=0.00$), preterm labour (18%, $p=0.01$), placental abruption (9%, $p=0.00$), intrauterine growth restriction (7%, $p<0.00$), and caesarean section (60%, $p<0.00$) in cases compared to control group.¹⁵

Yavuz *et al* reported no statistically significant difference between hematoma and control groups regarding gestational age at delivery. While only the risk of miscarriage increased in patients with threatened abortion having SCH.⁷ Similarly, Peixoto *et al* observed a higher rate of miscarriage in the first trimester intrauterine hematoma (IUH) group. They did not find any statistically significant differences in gestational age at delivery, preterm birth, birth weight, stillbirth and the Caesarean section rate between the groups.¹⁶ Kiran *et al* evaluated continued pregnancies for complications related to antenatal period, delivery and intrapartum events along with foetal outcomes. The incidence of preterm deliveries was significantly higher (20%) in pregnancies complicated by first trimester bleeding with hematoma while it was 7.7% in pregnancies without hematoma. Both groups have similar risk of miscarriage and antepartum haemorrhage. However, there was an increased risk of preeclampsia, foetal growth restriction, preterm birth, caesarean delivery, and low birth weight baby in subjects having first trimester bleeding with subchorionic hematoma.¹⁷ Shayesta *et al* also reported that presence of subchorionic hematoma during first and second trimester of pregnancy is related to unfavourable pregnancy outcomes such as spontaneous miscarriage and preterm delivery.¹⁸

Retha *et al* investigated 100 females with single alive foetus having a subchorionic hematoma. The incidence of miscarriage and preterm birth was 35% and 21% respectively. In females with subchorionic and retro placental hematomas preterm delivery (<37 weeks) was the most frequently investigated outcome. It has been suggested that mechanical uterine irritation results from localized accumulation of blood and therefore stimulates contractions.¹⁹ Rashmi *et al* in a prospective study assessed a total of 300 patients. Out of these, 150 patients were cases with threatened abortion and 150 patients were included in control group without vaginal bleeding. In threatened abortion group 32 (21%) patients had subchorionic bleeding. Seventy-five patients delivered at 34–37 weeks, contributing to the highest number in threatened abortion group. Thirty-three patients delivered at 28–34 weeks while term delivery was 6. Incidence of preterm delivery, abortions, low foetal weight, and premature rupture of membranes was increased in threatened abortion group. Mean pregnancy period was 243 days in

threatened miscarriage group while in control group it was 263 days.¹¹

The mechanism of SCH causing unfavourable pregnancies is still controversial. Chronic inflammation in placental membranes and decidua's causing preterm premature membrane rupture is considered as the possible mechanism. SCH causes preterm membrane rupture after infection in that focal point. Ischemia, thrombosis, and necrosis of deciduas result in bleeding along with thrombin formation and inflammatory response. Thrombin can cause spontaneous abortion and preterm labour during term pregnancies.^{20,21} In another Turkish case-control study, Ozkaya *et al* reported that SCH was significantly associated with increased risk of IUGR and miscarriage but was not significantly related to preterm labor.²² The results of our study were partially concordant with the literature as the presence of SCH did not increase the risk of preterm labour.

CONCLUSION

In conclusion, SCH does not increase the risk of preterm labour in patients with threatened abortion during first half of pregnancy. However, it is not absolute whether the presence of a SCH increases the risk of adverse pregnancy outcome in ongoing pregnancies or not.

RECOMMENDATIONS

To determine the true role of SCH in the prognosis of ongoing pregnancies, large prospective randomized studies are required. Therefore, it is important that such pregnancies should be considered as high risk and should be provided careful antenatal care to reduce the risks for adverse pregnancy outcomes.

AUTHORS' CONTRIBUTION

RIK: Data Collection, review. AT: Literature review, discussion. AN: Reference writing, review, discussion. UZ: Data collection. SA: Statistical analysis, results tabulation. FN: Statistical analysis.

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