

Role of Ultrasound in Detection of Abruption Placentae and its Clinical Correlation

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ABSTRACT

Introduction: Abruption placentae is one of the major complications in second half of pregnancy. It accounts for 0.4-1 % of all deliveries. With the advent of ultrasonography, though abruption placentae has been diagnosed however the sensitivity is less. Those patients clinically suspicious of abruption placenta with negative ultrasound findings can have positive intrapartum findings suggestive of abruption. Fetal outcome is associated with the gestational age. Preterm deliveries with abruption have higher incidence of perinatal morbidity and mortality as compared to term pregnancies.

Methods: It is a prospective study conducted in Manipal Teaching Hospital, Pokhara from July 2017 to July 2018. All the cases of more than twenty eight weeks gestation, singleton pregnancies without preexisting maternal medical diseases suspicious of abruption placentae were included in the study. Ultrasonological and intrapartum findings were recorded. Data was analyzed using SPSS (VERSION16).

Results: Out of forty patients presented with per vaginal bleeding, sixteen were diagnosed as placental abruption either clinically or ultrasonographically. Only ten patients had positive ultrasound findings of retroplacental clot or subchorionic hemorrhage. Out of six patients with negative ultrasound findings, only four had positive Intrapartum findings suggestive of abruption placenta. The specificity (100%) of ultrasound in diagnosing abruption was more than the sensitivity (71.43%) and the accuracy was 75%.

Conclusion: Ultrasound is less sensitive in diagnosing abruption placenta and the lesser the gestational age, the more in the increase in perinatal morbidity and mortality.

Key words: Gestational Age; Hemorrhage, Uterine; Premature Birth

INTRODUCTION

Antepartum hemorrhage is defined as the bleeding from the vagina before the onset of labour. It is one of the leading cause of increase maternal and perinatal mortality

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and morbidity globally. Abruptio placenta is defined as the separation of the placenta from its implantation site before delivery. It is also known as placenta abruption, accidental hemorrhage. The Latin term abruption placenta means “rending asunder of the placenta” and denotes a sudden accident, which is a clinical characteristics of most cases.¹ Abruption placenta complicates around 0.4-1% of deliveries and is associated with increased risk of preterm deliveries, IUFD and still birth.^{2,3,4,5,6} The incidence of preterm births associated with abruption placenta may be up to 10%.² The diagnosis of abruption is usually made clinically. The triad includes abdominal pain, unusual uterine tenderness and vaginal bleeding. The classical hallmark is per vaginal bleeding which may be present in up to 80-90% of the cases. However, these symptoms may not be present in all the cases.

With the advent of ultrasound, it has been useful in the diagnosis of antepartum hemorrhage. However, in abruption placenta of mild or early stage or in revealed type, where the blood has escaped out of the vagina, no ultrasound findings may be detected. The ultrasound findings of abruption may show retroplacental blood clots, marginal hematoma, subchorionic hematoma.⁹ The purpose of this study was to estimate the sensitivity, specificity and accuracy of ultrasound in the diagnosis of placental abruption and its clinical correlation with fetomaternal outcome.

METHODS

This is a prospective study which was carried out in the obstetrics department of Manipal Teaching Hospital, Pokhara, for a period of one year from July 2017 to July 2018. All pregnant women beyond 28 weeks of gestation presented in the emergency with suspicious of abruption placenta were included in the study. All women beyond 28 weeks of gestation with vaginal bleeding were sent for ultrasonography and those detected with abruption were included in the study. However, those with negative radiological findings of abruption but clinically suspected

as they had uterine tenderness associated with vaginal bleeding were included in the study. All those pregnant ladies with per vaginal bleeding but ultrasonologically diagnosed of placenta previa, those with gestational age less than 28 weeks, multiple pregnancies and preexisting medical illness of the mother were excluded from the study.

Out of forty pregnant ladies beyond twenty eight weeks gestation with singleton pregnancies without preexisting medical problems who presented in the emergency with history of per vaginal bleeding, only sixteen were diagnosed with abruption placentae either ultrasonologically or clinically. Positive sonographic findings were defined as presence of retroplacental blood clot or subchorionic hematoma. Negative radiological findings but clinical findings of per vaginal bleeding, uterine tenderness, and abnormal fetal heart sound after exclusion of placenta previa and local causes and by examination of placenta showing depression in the maternal side of the placenta after were included in the study. Data were collected and then sensitivity, specificity, accuracy of the ultrasound was calculated using SPSS version 16 and were correlated clinically.

RESULTS

During the study period from July 2017 to July 2018 there were 2769 deliveries. Only sixteen patients were diagnosed abruption clinically or radiologically. This showed that the incidence of abruption was 0.58% (n=16). Out of sixteen pregnant ladies who presented in the emergency with the history of per vaginal bleeding, only ten patients had positive ultrasonological findings of abruption showing subchorionic hemorrhage or retroplacental blood clots. In six patients, there were negative ultrasonological findings. Out of these six patients, four had positive intraoperative findings suggestive of abruption placentae. All of the four patients had blood mixed liquor and one had couvelliere uterus. The two patients who were suspected clinically of abruption placentae but with negative ultrasonographic findings had no evidence of abruption intrapartum. As

there was irregular heart sound and tonic and tender uterine contraction with per vaginal bleeding, these two patients were undergone cesarean section for good fetal outcome (Table 1). The sensitivity of ultrasound in detecting abruption was 71.43% (CI 41.90% - 91.61%), specificity was 100% (CI 15.81%-100%) and accuracy was 75% (CI 47.62%-92.73%) as shown in Table 2.

Out of sixteen patients, three were less than thirty four weeks gestation, six were between thirty four and thirty seven weeks gestation and seven were more than thirty seven weeks of gestation. In this study, there were two intrauterine fetal deaths and two were still births. All these four cases were less than thirty four weeks of gestation. Six babies needed admission in neonatal intensive care unit but there were no neonatal death recorded as this may be due to early detection and intervention for the good perinatal outcome. All the patients beyond thirty four weeks of gestation underwent cesarean section and only two of less than thirty two weeks of gestation had vaginal delivery as they had come in active

stage of labour with absent fetal heart sound. However, ultrasound was done to confirm the viability of the fetus which showed evidence of retroplacental blood clots and absent fetal heart sound. One patient had couvelaire uterus (Table 3).

Table 1: Ultrasound and Intrapartum findings of abruption placentae

Ultrasound findings	Intrapartum findings	
	Present	Absent
Present	10	0
Absent	4	2

Table 2: Sensitivity, specificity and accuracy of ultrasound

		95% CI
Sensitivity	71.43%	41.90% - 91.61%
Specificity	100%	15.81%-100%
Accuracy	75%	47.62%-92.73%

Table 3: Clinical correlation with fetal outcome

Gestational age		IUFD	Still birth	NICU admission
< 34 weeks	4	2	2	
34-37 weeks	6			4
>34 weeks	6			2

DISCUSSION

Abruptio placentae is one of the major cause of vaginal bleeding in second half of pregnancy. This study is conducted to diagnose abruption ultrasonographically and its clinical correlation. The incidence of abruption in this study is 0.58%. Several studies have shown the incidence of abruption to be 1%.^{1,10,11}

Due to the advancement in the radiological machines, diseases have been diagnosed earlier but despite these improvements, the radiological sensitivity in the diagnosis of abruption has not been improved since the last two decades. Only 1 out of 9 cases showed positive sonograms findings of abruption.¹²

This study showed that ultrasound has specificity than sensitivity (100% versus 71.43%) with accuracy of 75% in detecting abruption placenta.

This is consistent with the study done by Shinde et al¹³ which showed that USG has low sensitivity but high specificity (57% versus 100%) in detecting abruption. Similarly the study conducted by Glantz et al¹¹ also showed that USG has low sensitivity but high specificity (24% and 96% respectively). However, study conducted by Yeo and colleagues¹⁴ had sensitivity of 80% and specificity of 92%. Thus, this showed that half of the cases were missed in ultrasound.

However, negative ultrasound findings will not rule out abruptio. In our study a 25% cases (4 out of 16) had negative ultrasound findings but positive Intrapartum findings suggestive of abruptio placentae. This is similar to the study conducted by Sholl¹⁵ which showed that sonographic evidence of retroplacental clot suggesting abruptio were seen only in 25% of the cases. Similarly, Jaffe et al¹² showed positive ultrasound findings in 50% of the cases.

The fetal outcome depends on the gestational age. The risk to the fetus depends on both the gestational age and the degree of abruptio.³ Preterm fetus with positive findings in USG suggestive of abruptio has poor outcome as compared to term fetus. This is consistent with the study done by Shinde et al¹³ where seven patients out of sixteen were preterm and had IUFD/stillbirth babies. Similarly, a population based cohort study of 7,508,655 pregnancies conducted in US, showed a perinatal mortality rate of 119 per 1,000 live births among pregnancies complicated with abruptio placentae and this increased perinatal mortality was likely because one half of the delivery was preterm.³ In our study, there were two IUFDs and two stillbirths and all were less than thirty four weeks gestations. Six neonates needed NICU admission but all were more than thirty four weeks gestations. However, there was no neonatal deaths.

CONCLUSION

This study showed that the specificity of the ultrasound in detection of abruptio placenta was more than its sensitivity. In cases of negative sonographic findings but strong clinical suspicious of abruptio, timely intervention in delivery will decrease the perinatal morbidity and mortality. However, the lesser the gestational period more will be the perinatal morbidity and mortality.

CONFLICT OF INTEREST

None

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None

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