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Frequency of Placental Abruption in Patients with Pregnancy Induced Hypertension

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ABSTRACT

Background: Pregnancy-induced hypertension is a significant obstetric conditions that appears after the 20th week of pregnancy and is associated with various maternal and fetal complications. Placental abruption represent a serious complication characterized by premature separation of the placenta from the uterine wall before delivery. **Objective:** To determine the frequency of placental abruption in patients with pregnancy-induced hypertension. **Study Design:** Cross-sectional study. **Duration and Place of Study**: This study was conducted from January 2025 to May 2025 in the Department of Obstetrics and Gynecology, Ayub Teaching Hospital, Abbottabad. **Methodology**: A total of 130 women aged 18 to 40 years with singleton pregnancy, gestational age more than 37 weeks and diagnosed with pregnancy-induced hypertension were included. Placental abruption was diagnosed based on clinical examination and ultrasound features. Data was analyzed using SPSS version 26. Chi-square test and Fisher exact test were applied for categorical variables. **Results**: The frequency of placental abruption was 13.10%. Significant associations were found with maternal age more than 30 years (p less than 0.001), gestational age more than 39 weeks (p less than 0.001), parity more than 3 (p less than 0.001), low socioeconomic status (p less than 0.001) and rural residence (p less than 0.001). **Conclusion**: Placental abruption is a considerable complication in pregnancy-induced hypertension with higher risk in advanced maternal age, increased gestational age and multiparity.

INTRODUCTION

Pregnancy-induced hypertension (PIH) refers to a condition that appears during pregnancy, usually after the 20th week of pregnancy, and becomes evident due to high blood pressure without any previous history of hypertension.[1] It usually occurs during the first pregnancy and due to placental malformation and poor perfusion of the mother and the fetus.[2] PIH might initially present with mild symptoms but may worsen if not properly monitored and overseen. PIH affects the maternal vascular system by causing the arteries to constrict due to the lack of delivery of oxygen and nutrients to the maternal organs.[3] Pregnancy-induced hypertension risk factors include obesity, multiple pregnancies, and the presence of diabetes mellitus and a positive family history.[4]

Pregnancy-induced hypertension poses serious threats both for mothers and their fetuses in case the hypertensive disease advances in severity.[5] Maternal complications include the possibility of developing pre-eclampsia and eclampsia, stroke, kidney failure, and liver dysfunction.[6] High blood pressure in mothers can subsequently lead to placental insufficiency, ultimately causing fetal growth restriction and decreased infant weight.[7] Maternal outcomes include fetal growth restriction, prematurity, low Apgar scores, and an increased risk of infant deaths during the perinatal period.[8]

Placental abruption is a severe complication that is closely linked to pregnancy-induced hypertension.[9] It is a condition in which the placenta separates from the uterine wall in advance of delivery. It is accompanied by bleeding from the birth canal and fetal hypoxia. However, in pregnancy-induced hypertension, high blood pressure in pregnant women leads to rupture of blood vessels in the placenta, causing bleeding.[10] Symptoms associated with this condition include abdominal pain, bleeding from the birth canal, uterine pain, and fetal distress.[11] Complications in pregnant women include risk of bleeding, shock, and disseminated intravascular coagulation.[12] In a study by Khan S, et al. has shown the frequency of placental abruption was 14.1% in patients with pregnancy induced hypertension.[13]

Placental abruption is a serious obstetric complication that

poses various risks to both mother and baby. Pregnancy-induced hypertension is a common condition found in pregnant women in Abbottabad. Placental abruption is a known complication of pregnancy-induced hypertension. There is a scarcity of literature about placental abruption in women with pregnancy-induced hypertension. The current study is needed to determine the prevalence and outcome of placental abruption in women with pregnancy-induced hypertension.

METHODOLOGY

This cross sectional study was carried out in the Department of Obstetrics and Gynecology Ayub Teaching Hospital Abbottabad from 15-01-2025 to 15-05-2025. Approval for the study was obtained from the institutional ethical committee before the start of data collection. The sample size was 130 and it was calculated by using WHO sample size software. The calculation was done with 95% confidence level, 6% margin of error and expected frequency of placental abruption as 14.1% in patients having pregnancy induced hypertension.[13] Women aged between 18 to 40 years having singleton pregnancy on ultrasound, gestational age more than 37 weeks based on last menstrual period, any parity and diagnosed with pregnancy induced hypertension were included in the study. Patients with history of placenta previa, diabetes mellitus, chronic hypertension, renal disease, trauma during current pregnancy and smoking were excluded. Pregnancy induced hypertension was considered when blood pressure was ≥140/90 mmHg measured on two different occasions with 4 hours interval and without protein in urine on laboratory testing. Written informed consent was taken from all patients before inclusion in the study after explaining the purpose and benefits of the research. Demographic information including age, gestational age, parity, body mass index, socioeconomic status and residential status was recorded at the time of enrollment.

A detailed history was taken and general physical as well as obstetrical examination was performed. Blood pressure was measured using standard sphygmomanometer and gestational age was confirmed from last menstrual period and ultrasound findings. Ultrasound examination was performed using real time 2D grayscale imaging with a 3–5 MHz curvilinear transducer. The placenta was examined in multiple planes to assess its location, margins, and internal texture. Maternal and fetal surfaces of placenta were evaluated carefully. The thickness of placenta was measured perpendicular to uterine wall at different points and surrounding areas were assessed for any abnormal echogenicity or concealed hemorrhage. Each ultrasonography procedure was done under the supervision of a consultant gynecologist with three years of experience post-fellowship. Results were recorded by the researcher using a specially designed data-recording form. Placental abruption was diagnosed in cases where there was a hard, nontender abdomen on clinical examination, in addition to ultrasonic features of a retroplacental hematoma characterized by a poor echo, intraplacental anechoic spaces, separation of the placenta with rounding of the edge of the placenta, a thickness of more than 5.5 cm, retroplacental myometrial thickness of 1-2 mm in the absence of focal myometrial contraction, in addition to intra-amniotic echoes due to hemorrhage.

Data was entered and analyzed using SPSS version 26. Quantitative variables were presented as mean ± standard deviation. Categorical variables were expressed as frequencies and percentages. Placental abruption was stratified with respect to age, gestational age, parity, BMI, socioeconomic status and residential status. Chi square test or Fisher exact test was applied after stratification and p value ≤0.05 was taken as statistically significant.

RESULTS

The study included 130 patients with pregnancy induced hypertension where mean age of patients was 30.46±4.83 years, mean gestational age was 39.13±1.17 weeks, and mean parity was 2.88±1.49. The mean BMI of patients was 28.28±3.30 kg/m^2. Regarding socioeconomic status, 57 patients (43.8%) was from low socioeconomic class, 59 patients (45.4%) was from middle class and 14 patients (10.8%) was from high socioeconomic status. Majority of patients 81 (62.3%) was from rural areas while 49 patients (37.7%) was from urban areas (as shown in Table-1).

Table 1

Patient Demographics

Demographics		Mean ± SD
Age (years)		30.46±4.83
Gestational Age (weeks)		39.13±1.17
Parity		2.88±1.49
BMI (kg/m^2)		28.28±3.30
Socioeconomic Status	Low n (%)	57 (43.8%)
	Middle n (%)	59 (45.4%)
	High n (%)	14 (10.8%)
Residential Status	Rural n (%)	81 (62.3%)
	Urban n (%)	49 (37.7%)

The frequency of placental abruption in patients with pregnancy induced hypertension was found in 17 patients (13.10%) while 113 patients (86.90%) was not having placental abruption (as shown in Table-2).

Table 2

Frequency of Placental Abruption in Patients with Pregnancy Induced Hypertension

Placental Abruption	Frequency	%age
Yes	17	13.10%
No	113	86.90%
Total	130	100%

When association of placental abruption with demographic factors was analyzed, it was found that all cases of placental abruption 17 (23.9%) was occurred in patients aged more than 30 years while no case was occurred in patients aged ≤30 years, this difference was statistically significant (p<0.001). Similarly, all cases of placental abruption 17 (27.0%) was occurred in patients with gestational age more than 39 weeks whereas no case was seen in patients with gestational age ≤39 weeks, showing highly significant association (p<0.001). Regarding parity, all 17 cases (37.8%) of placental abruption was found in patients having parity more than 3 while no case was found in patients with parity ≤3, this

association was also highly significant (p<0.001). For BMI, 17 patients (15.6%) with placental abruption was having BMI more than 25 kg/m^2 while no case was found in patients with BMI ≤25 kg/m^2, however this association was not statistically significant (p=0.073). All 17 cases (29.8%) of placental abruption was occurred in patients from low socioeconomic status while no case was found in middle and high socioeconomic groups, this difference was highly significant (p<0.001). Similarly, all cases of placental abruption 17 (21.0%) was found in rural patients while no case was occurred in urban patients, this association was statistically significant (p<0.001) (as shown in Table-3).

Table 3
Association of Placental Abruption with Demographic Factors

Demographic Factors		Placental Abruption Yes n(%)	Placental Abruption No n(%)	p-value
Age (years)	≤30	0 (0.0%)	59 (100.0%)	<0.001*
	>30	17 (23.9%)	54 (76.1%)	
Gestational Age (weeks)	≤39	0 (0.0%)	67 (100.0%)	<0.001*
	>39	17 (27.0%)	46 (73.0%)	
Parity	≤3	0 (0.0%)	85 (100.0%)	<0.001*
	>3	17 (37.8%)	28 (62.2%)	
BMI (Kg/m^2)	≤25	0 (0.0%)	21 (100.0%)	0.073*
	>25	17 (15.6%)	92 (84.4%)	
Socioeconomic Status	Low	17 (29.8%)	40 (70.2%)	<0.001*
	Middle	0 (0.0%)	59 (100.0%)	
	High	0 (0.0%)	14 (100.0%)	
Residential Status	Rural	17 (21.0%)	64 (79.0%)	<0.001*
	Urban	0 (0.0%)	49 (100.0%)	

*Fischer Exact Test

DISCUSSION

In current study the frequency of placental abruption was found to be 13.10% (n=17) which shows that placental abruption is common complication in hypertensive pregnancies. This occur because hypertension cause damage to blood vessels in placenta leading to premature separation. The elevated blood pressure creates abnormal placental vasculature and reduce blood flow which make placenta vulnerable to abruption. The study showed that all cases of placental abruption 17 (23.9%) was occurred in patients aged more than 30 years (p<0.001). This is because advancing maternal age is associated with decreased uterine blood flow and increased vascular changes in placenta. Older women have more chances of developing endothelial dysfunction and arteriosclerosis which compromise placental attachment and increase risk of abruption. All cases of placental abruption 17 (27.0%) was found in gestational age more than 39 weeks (p<0.001). This can be explained by the fact that as pregnancy progress beyond term, placenta start to age and undergo degenerative changes. The placental insufficiency become more common in post-term pregnancies which combined with hypertension further increase the risk of abruption. Higher parity showed strong association with placental abruption as all 17 cases (37.8%) was occurred in multiparous women with parity more than 3 (p<0.001). Multiparity causes architectural changes in the uterus and makes the myometrium less elastic. Previous pregnancies cause fibrosis and endometrial changes that affect the sites of placental attachment and the risk of placental separation in the setting of hypertension. There was a strong association with low socioeconomic status, where all 17 cases (29.8%) were found in the low socioeconomic stratum (p < 0.001). This is probably due to the additive effects of poor diet, inadequate antenatal care, and high stress levels in the low socioeconomic stratum. In the setting of pregnancy-induced hypertension, this makes for a high-risk situation for complications of the placenta, such as abruption.

The frequency of placental abruption in present study was 13.10% (n=17) which is comparable with findings of Khan S *et al.* [13] who reported 14.1% frequency of abruptio placenta in PIH patients and Reena *et al.* [14] who found 12.4% frequency. This similarity suggest that placental abruption occur in approximately 12-14% of pregnancies complicated by hypertension regardless of geographical location. However, this finding is lower than Malik N *et al.* [15] who reported 37.73% placental abruption in severe preeclampsia patients. This difference can be explained by the fact that their study included only severe preeclampsia cases while present study included pregnancy induced hypertension which is less severe condition, and severe preeclampsia cause more vascular damage leading to higher rates of abruption. The mean age in current study was 30.46±4.83 years which is similar to Memon NY *et al.* [16] who reported mean age of 30 years and Reena *et al.* [14] who found mean age of 31.14 years. This consistency indicates that women around third decade of life are more susceptible to hypertensive disorders and their complications. All cases of placental abruption 17 (23.9%) in present study was found in women aged more than 30 years (p<0.001) which is supported by Khan N *et al.* [17] who reported mean age of 31.35 years in placental abruption cases and Soomro P *et al.* [18] who found mean age of 32.12 years. The advanced maternal age is associated with degenerative vascular changes which compromise placental perfusion. Present study found significant association between multiparity and placental abruption where all 17 cases (37.8%) occurred in women with parity more than 3 (p<0.001). This finding is consistent with Memon NY *et al.* [16] who reported 54% cases was multiparous and Hashmi IB *et al.* [19] who found 78% cases was multigravida. Similarly, Nosheen *et al.* [20] reported 60% multiparous women in their study. This consistent pattern across studies indicate that repeated pregnancies cause cumulative damage to uterine vasculature and endometrium which increase susceptibility to abruption in presence of hypertension. Low socioeconomic status showed strong association in current study where all 17 cases (29.8%) was from low socioeconomic group (p<0.001). This is in agreement with Khan N *et al.* [17] who reported two-thirds of cases belonged to poor socioeconomic status. The poor socioeconomic conditions is associated with malnutrition, limited access to healthcare and inadequate antenatal care which contribute to higher risk of complications. Rural residence also showed significant association in present study where all cases 17 (21.0%) was from rural areas (p<0.001) which is similar to Memon NY *et al.* [16] who found 66% cases belonged to rural areas and Soomro P *et al.* [18] who studied rural population. Rural women have limited access to specialized obstetric care and timely intervention which

increases risk of adverse outcomes in hypertensive pregnancies.

The study has a number of limitations that must be acknowledged. First, the study was done in one institution, which could affect its generalizability. The study was done on a relatively small number of patients, 130, which could affect its sensitivity in detecting associations. The study does not allow for the determination of causality between the risk factors and placental abruption. The study does not use data that could allow for the determination of the outcome of placental abruption on the mother and the fetus.

CONCLUSION

Placental abruption is a serious complication for patients suffering from pregnancy-induced hypertension. The prevalence of placental abruption was observed to be high in hypertensive pregnancies. The important risk factors that have a significant association with placental abruption in hypertensive patients are advanced maternal age, high gestational age, high parity, low socioeconomic status, and residence in a rural area.

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Ethical Approval: The study got ethical approval from the Ethical Committee. All study work was done according to the rules of the committee and the Helsinki Declaration.

Patients' Consent: All patient gave written consent before taking part in the study. They were told that their information will stay private and they can leave the study anytime.

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