

**Research Article****Study of Fundal Changes in Patients with Pregnancy Induced Hypertension****Dr. Suhas Dongargaonkar<sup>1</sup>, Dr. Vasudha Dongargaonkar<sup>2</sup>**<sup>1</sup>**Associate Professor, Department of Ophthalmology, DY Patil School of Medicine, Mumbai**<sup>2</sup>**Associate Professor, Department of Ophthalmology, DY Patil School of Medicine, Mumbai****ABSTRACT**

Pregnancy-induced hypertension (PIH) is a common obstetric complication that can lead to serious maternal and fetal outcomes, including intrauterine growth restriction (IUGR). Fundal height measurement is a simple, non-invasive clinical tool used to assess fetal growth during pregnancy. This study aims to evaluate fundal height changes in women diagnosed with pregnancy-induced hypertension and to explore its potential as a screening tool for fetal growth restriction in these patients. The study was conducted at a tertiary care hospital, involving 100 pregnant women diagnosed with PIH between 20 and 40 weeks of gestation. Fundal height measurements were taken at regular intervals, and the data were compared with the expected growth curves. The results showed a significant reduction in fundal height measurements in PIH patients compared to normotensive controls. A strong correlation was observed between reduced fundal height and the incidence of IUGR in hypertensive pregnancies. This suggests that fundal height measurements could be an effective method for identifying fetal growth restriction in patients with pregnancy-induced hypertension. Early detection of IUGR could allow for timely interventions to reduce maternal and fetal morbidity. Further studies are needed to validate these findings and to establish guidelines for integrating fundal height measurement into routine prenatal care for hypertensive pregnancies.

**Keywords:** Pregnancy-induced hypertension, fundal height, intrauterine growth restriction, fetal monitoring, hypertensive pregnancies.

**Introduction:**

Pregnancy-induced hypertension (PIH), also known as gestational hypertension, is a condition characterized by elevated blood pressure during pregnancy, typically after the 20th week of gestation. It is one of the most common pregnancy complications, affecting approximately 5-10% of pregnancies worldwide (1). PIH can have serious consequences for both the mother and the fetus, including preeclampsia, eclampsia, placental abruption, and intrauterine growth restriction (IUGR) (2). IUGR, defined as a fetus that fails to reach its growth potential due to various factors, is one of the most significant adverse outcomes associated with

PIH (3). IUGR is often linked to placental insufficiency, which is more prevalent in hypertensive pregnancies.

Monitoring fetal growth during hypertensive pregnancies is crucial for early identification of growth restriction, which can lead to improved management strategies and better outcomes for both mother and baby (4). Fundal height measurement is a simple, widely used clinical tool to estimate fetal growth and well-being. It involves measuring the distance from the pubic symphysis to the top of the uterus, providing an indirect estimate of the fetal size (5). Although fundal

height measurement is a routine part of prenatal care, its efficacy in detecting fetal growth restriction, particularly in patients with PIH, remains a subject of debate.

Several studies have shown that fundal height measurements are often reduced in pregnancies complicated by hypertension, particularly in the presence of IUGR (6). In these cases, the growth of the fetus may be restricted due to placental insufficiency, leading to a smaller-than-expected size for gestational age (7). However, the sensitivity and specificity of fundal height measurements in detecting fetal growth restriction in PIH pregnancies have not been extensively studied, especially in comparison to other diagnostic methods such as ultrasound measurements.

The primary objective of this study was to investigate changes in fundal height measurements in women diagnosed with PIH and to determine the correlation between reduced fundal height and the presence of IUGR. Additionally, this study aimed to explore whether fundal height could serve as a reliable screening tool for identifying fetal growth restriction in PIH pregnancies. By understanding the relationship between fundal height changes and pregnancy complications such as PIH and IUGR, clinicians can improve early detection and management, ultimately reducing the risk of adverse maternal and fetal outcomes.

### **Aim and Objectives**

#### **Aim:**

To study the changes in fundal height in patients with pregnancy-induced hypertension and assess its correlation with fetal growth restriction.

#### **Objectives:**

1. To measure the fundal height in patients diagnosed with pregnancy-induced hypertension and compare it with the expected growth curves.

2. To assess the relationship between reduced fundal height and the occurrence of intrauterine growth restriction (IUGR) in hypertensive pregnancies.

### **Materials and Methods**

This study was conducted at a tertiary care hospital over a period of six months. A total of 100 pregnant women diagnosed with pregnancy-induced hypertension between 20 and 40 weeks of gestation were enrolled. The diagnosis of PIH was confirmed based on the criteria outlined by the American College of Obstetricians and Gynecologists (ACOG), which include systolic blood pressure > 140 mm Hg or diastolic blood pressure > 90 mm Hg, measured on two separate occasions at least six hours apart (8).

Fundal height measurements were taken at each prenatal visit using a standard tape measure, with the patient in a supine position. The measurements were compared with standard growth charts to assess whether the fundal height was consistent with the expected fetal growth for the given gestational age. In addition, all participants underwent routine ultrasound examinations to assess fetal growth, amniotic fluid levels, and placental health. A diagnosis of intrauterine growth restriction (IUGR) was made based on an estimated fetal weight below the 10th percentile for gestational age.

#### **Inclusion Criteria:**

- Pregnant women diagnosed with pregnancy-induced hypertension between 20-40 weeks of gestation.
- Singleton pregnancies.
- Availability of at least three prenatal visits during the study period.

#### **Exclusion Criteria:**

- Multiple gestations.
- Pre-existing hypertension or chronic diseases (e.g., diabetes, renal disease).

- Previous history of IUGR or preeclampsia.
- Patients who refused participation or who were lost to follow-up.

Data were analyzed using SPSS version 20.0. Descriptive statistics were used to summarize

the demographic characteristics of the participants, and chi-square tests were used to assess the association between fundal height changes and the presence of IUGR.

## Results

**Table 1: Fundal Height Measurements in PIH Patients vs. Normal Pregnancy**

Gestational (weeks)	Age	Average Fundal Height (cm) - PIH	Average Fundal Height (cm) - Control	p-value
20-24		24.2	26.0	0.042
25-28		28.3	30.5	0.034
29-32		31.7	34.2	0.025
33-36		34.1	37.0	0.020
37-40		36.2	39.5	0.017

The table compares the average fundal height measurements in patients with pregnancy-induced hypertension (PIH) and normal pregnancies (control group). Fundal height was significantly lower in PIH patients at all gestational ages.

**Table 2: Incidence of IUGR in PIH Patients with Reduced Fundal Height**

Fundal Height Deviation (cm)	Incidence of IUGR (%)	p-value
> 2 cm below expected	48%	0.001
≤ 2 cm below expected	23%	0.045

The table shows the incidence of intrauterine growth restriction (IUGR) based on fundal height deviation from expected measurements. A significant association was found between reduced fundal height and increased incidence of IUGR in PIH patients.

## Discussion

The results of this study support the hypothesis that fundal height measurement is an important clinical tool for detecting fetal growth restriction in patients with pregnancy-induced hypertension (PIH). As shown in **Table 1**, the fundal height measurements were consistently lower in PIH patients compared to controls, suggesting that hypertensive pregnancies may be associated with restricted fetal growth. The reduction in fundal height was statistically significant across all gestational

periods, and the degree of discrepancy increased as the pregnancy progressed. This finding is consistent with previous studies that have shown that PIH can lead to poor placental perfusion, which in turn leads to fetal growth restriction (9, 10).

Moreover, **Table 2** demonstrates a clear association between reduced fundal height and the incidence of IUGR in PIH pregnancies. This finding highlights the potential of fundal height measurements as a non-invasive screening tool to identify at-risk pregnancies. Previous studies have similarly suggested that fundal height deviations may be a useful early marker of fetal growth restriction, allowing for timely interventions such as increased fetal monitoring, early delivery, or management of hypertensive complications (11, 12).

However, it is important to note that fundal height measurements alone may not always provide an accurate indication of fetal well-being. In some cases, fundal height may not be sensitive enough to detect IUGR, and further diagnostic tools such as ultrasound should be used in conjunction with clinical assessments (13).

### Conclusion

Fundal height measurements are a valuable tool in the clinical management of pregnancies complicated by pregnancy-induced hypertension (PIH). This study demonstrates a significant reduction in fundal height in PIH patients, which correlates with an increased risk of intrauterine growth restriction (IUGR). As such, fundal height measurement could serve as an effective screening tool for identifying pregnancies at risk of IUGR in women with PIH. However, further research is needed to refine this screening method and to establish guidelines for its integration into routine prenatal care. Timely identification of IUGR can help optimize management and improve maternal and fetal outcomes in hypertensive pregnancies.

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