



## Fundoscopic Changes in PIH and Association With Maternal and Fetal Outcomes

### KEYWORDS

\* Revathy K

Associate professor, department of Ophthalmology, GGH, Kurnool, A.P. \* Corresponding author

Varalakshmi B

Assistant professor, Department of obstetrics and gynecology, GGH, Kurnool

### ABSTRACT

*Pre eclampsia is defined as hypertension and proteinuria occurring after 20 weeks of pregnancy. The visual system may be involved in PIH. Visual system involvement is due to the severe toxemia. The fundus changes are underdiagnosed and there are lack of studies documenting correlation between severity of PIH, fundus changes with maternal and fetal outcomes in Indian context. This observational study was undertaken to estimate the frequency and severity of fundoscopic changes in PIH and determine the association between severity of PIH, Fundus changes and pregnancy outcome.*

**INTRODUCTION:** The term 'Pregnancy Induced Hypertension' (PIH) includes Gestational hypertension, Pre-eclampsia and Eclampsia. Pre eclampsia is defined as hypertension and proteinuria occurring after 20 weeks of pregnancy. It affects multiple organ system that include cardiovascular changes, haematological abnormalities, neurological or visual manifestation<sup>1</sup>, hepatic and renal impairment. Multiple organs may be involved in PIH. Cardiovascular effects include vasospasm, increased cardiac output and hemoconcentration. Renal function abnormalities include decreased GFR and sodium retention, proteinuria. Hepatic dysfunction and platelet abnormalities may occur. Neurological involvement may vary from headache and drowsiness to seizures, hemiplegia and coma. The visual system may be involved in PIH. Visual system involvement is due to the severe toxemia. The most common abnormality seen is a spasm and narrowing of the retinal vessels. The fundus changes are underdiagnosed and there are lack of studies documenting correlation between severity of PIH, fundus changes with maternal and fetal outcomes in Indian context.

**AIM OF THE STUDY:** To estimate the frequency and severity of fundoscopic changes in PIH and determine the association between severity of PIH, Fundus changes and pregnancy outcome.

**MATERIALS:** This is an observational study conducted in Government General Hospital(GGH) , Kurnool during May 2014 to JAN 2015 off 100 patients attending the antenatal clinic.

**Inclusion criteria:** All patients diagnosed with PIH after 20 weeks of Pregnancy were enrolled in the study and followed up.

**Exclusion criteria:** all patients with secondary causes of hypertension were excluded from the study

**Methods:** Informed consent was taken, Fundus examination was done with Direct Ophthalmoscopy, after dilating the pupils with 1% Tropicamide drops and this examination was repeated in subsequent visits till delivery in case who showed abnormal fundal changes. Hypertensive retinopathy changes seen in right or left or both eyes, was taken as positive findings in that patient. Age, para, gravida,

blood pressure systolic and diastolic, proteinuria, weight were noted. The hypertensive retinopathy changes were graded according to Keith Wagener classification<sup>2</sup>. Patients were followed up after delivery and mode of delivery with complications were recorded. The fetal outcome was studied like term /preterm delivery, fetal birth weight, APGAR score were also noted.

### RESULTS :

A total of 100 patients were studied over a period of 9 months. The mean age of the patients in our study was 28.4 yrs. Among our patients 44% had no symptoms apart from pedal edema, next common symptom being headache. Out of 100 cases, 50% of our patients had fundus changes of hypertensive retinopathy. Among those patients with fundus changes 26% had convulsions(n=13), 24% had headache(n=12), 8% of patients complained of blurring of vision, sudden loss of vision was complained by 4 % of patients(n=2). Thirty four (32%) patients had grade I hypertensive changes. Grade II and Grade III changes were seen in 8% and 8% respectively, and grade IV changes were seen in 2% of patients. 2 patients in our study had retinal detachment.

The mean systolic blood pressure (SBP) in patients with fundus changes was 151.4±16.6 mmHg(mean±SD), whereas in patients without fundus changes the mean SBP was 142.2±25.8 mmHg. In our study 90% of patients had proteinuria, with patients having 2+ proteinuria showing increased incidence of fundus changes. Total of 22 patients had eclampsia(22%), 13 patients had eclampsia with fundus changes i.e, whereas 9 patients with eclampsia had no suggestive fundus changes.

FUNDUS changes	Number of patients (n)	percentage
No changes	50	50%
Grade 1	32	32%
Grade 2	8	8%
Grade 3	8	8%
Grade 4	2	2%

parameter	Retinal changes absent n=50	Retinal changes present=50
Blood pressure		
<150mmHg Systolic	32	28
<100mmHg diastolic		
>150mmHg systolic	18	22
>100mmHg diastolic		
Proteinuria		
nil	9	1
1+	13	5
2+	17	25
3+	7	18
4+	4	1

Maternal outcomes were also assessed in relation to fundus changes. 5 patients had abruption placenta, out of them 4 had fundus changes (80%). Higher incidence of HELLP syndrome and renal failure was noted in patients with fundus changes in our study. Majority of the patients in our study had vaginal delivery, 22% (n=22) patients in our study had caesarian section, 20% of patients (n=10) with fundus changes delivered by caesarian section, 24% of patients (n=12) without fundus changes delivered by caesarian section.

Maternal OUTCOME	With retinal changes n=50	Without retinal changes n= 50
Abortions	4	4
Vaginal Delivery	21	11
IN VD	15	23
LSCS	0	1
Emergency LSCS	10	11
Complications:		
HELLP	3	1
DIC	1	1
Renal failure	2	0
death	0	1

Fetal outcomes were also assessed in patients with preeclampsia. Patients with fundus changes had significantly higher incidence of preterm births ( $p > 0.05$ ), and also low birth weight (LBW) babies ( $p > 0.05$ ). 70% of patients with fundus changes had LBW babies. Total of 19 still born births were noted, out of which 12 were in patients with

fundus changes.

Fetal outcome	With fundus changes (n)	Without fundus changes (n)
Term	7	21
Preterm	27	18
LBW (<2.5kgs)	35	26
Stillborn	12	7
APGAR <5	10	9

**DISCUSSION:** In our study out of 100 patients with PIH, 50 patients (50%) had fundus changes of hypertensive retinopathy graded according to Keith Wagener classification. The prevalence rate is similar when compared to other studies. In a study by Sagili *et al*<sup>3</sup>, hypertensive retinopathy changes were seen in 59% of patients with PIH. In a study by Tadin. I. *et al*<sup>4</sup> from Croatia, 45% of patients with PIH had retinal changes. In our study there was association between blood pressure and retinopathy changes, which was also observed in study by Tadin *et al*. Karki *et al*<sup>5</sup> from Nepal have reported 13.7% of fundus changes in their study of 153 subjects with PIH. In a study by Rasdi *et al*<sup>6</sup>, showed a prevalence of 21.5%. In a study by Javadekar *et al*<sup>7</sup>, from India observed retinal changes in 42% of patients of PIH. In our study most of the patients had grade I retinopathy, similarly in a study by Sagili *et al* 52.6% of patients had Grade I retinopathy. No significant association was found between retinopathy grade and proteinuria in our study. Our study showed that presence of fundus changes in a patient of pre eclampsia was not significantly associated with maternal outcomes in terms of mode of delivery, but there was a significant association between fundus and maternal complications. There was significant association between birth weight and fundal changes, along with increased incidence of preterm births. In the study by Karki *et al*, the presence of fundal changes in PIH was not associated significantly with fetal outcomes in terms of gestational age, APGAR score 1, still birth and neonatal death but it was associated with low birth weight. Some studies reported poor fetal prognosis, while others reported no prognostic implications on the fetus. In a study by Ranjan *et al*<sup>8</sup> showed that presence of fundus changes in patients of PIH was significantly associated with LBW ( $P < 0.05$ ), but was not associated with fetal outcome in terms of gestational period.

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