


Original Research Article

# Evaluation of visual impairment in pregnancy induced hypertension

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## Abstract

**Introduction:** Pregnancy induced hypertension is considered as the major cause of maternal morbidity and mortality in developing as well as developed countries complicating 7 – 10% of all pregnancies. Since fundus changes are very good gauge for severity of hypertension for differentiating chronic hypertension in pregnancy induced hypertension, the current study was conducted to assess the visual impairment in relation to the fundus changes in antenatal women with pregnancy induced hypertension.

**Materials and methods:** 56 Pregnant females admitted with pregnancy induced hypertension in Meenakshi Medical College and Research Institute were evaluated thoroughly for eye signs and fundus examination with direct and indirect ophthalmoscope.

**Results:** The most common fundus changes observed were grade 1 and grade 2 hypertensive retinopathy with grade 3 and grade 4 hypertensive retinopathy the least found.

**Conclusion:** The current study concludes that retinal changes leads to poor visual and systemic prognosis and a premature delivery of fetus gives a better prognosis.

## Key words

Fundus, Retinopathy, Visual impairment, Pregnancy induced hypertension.

## Introduction

Pregnancy induced hypertension is defined as new onset hypertension with proteinuria or edema or both occurring after 20<sup>th</sup> week of

gestation and resolving shortly after delivery. It was earlier called “toxemia of pregnancy” since it was thought to be caused by the toxins present in blood during pregnancy. Incidence of

preeclampsia in developed countries is almost 5% with a maternal mortality rate as high as 1.8% [1, 2].

The complications of preeclampsia extend to involve multiple organs and systems, the eye and visual system are no exception. Pregnancy can affect anywhere in the visual pathway from anterior segment to the visual cortex. Retinopathy of pregnancy was first described in 1855 by von Graefe, just 4 years after the invention of ophthalmoscope by Von Helmholtz [3]. Miller was the first obstetrician to correlate fundus changes with pregnancy induced hypertension. Sadowsky was the first one to correlate vascular changes with severity of PIH and foetal mortality and used progressive retinal arteriolar change as a guideline for termination of pregnancy [4]. Ocular sequelae of 30 – 100% is seen in patients with HELLP syndrome [5].

Preeclampsia/eclampsia has various ocular manifestations. Visual symptoms concern up to 25% of patients with severe preeclampsia and 50% of patients with eclampsia. Blurred vision is the most common visual complaint [6]. The most common ocular finding is focal/generalized arteriolar narrowing. Other common symptoms are photopsia, visual field defects, sudden inability to focus, and in severe cases, complete blindness [3, 7].

Complete blindness is rare, with an incidence of 1 – 3%. Blindness in preeclampsia/eclampsia syndrome can be due to the involvement of cortex, retina or optic nerve [8]. Earlier, most cases of blindness were attributed to retinal pathology including vascular abnormalities, edema or retinal detachment and acute ischemic optic neuropathy as a result of decreased blood supply to the prelaminar portion of the optic nerve. But nowadays, more emphasis is being placed on cortical blindness [9, 10].

Hence the aim of the current study was to assess the visual impairment in relation to the fundus changes in antenatal women with pregnancy induced hypertension.

## Materials and methods

A total of 56 pregnant females aged between 18-40 years irrespective of gravida, gestational period or status of blood pressure admitted with pregnancy induced hypertension in Meenakshi Medical College and Research Institute from March 2017- September 2018 were included in this study. PIH along with gestational diabetes, hypothyroidism or anemia were excluded from the study. All the patients were evaluated thoroughly for eye signs, such as visual acuity (Snellen chart/ Slit lamp examination,) color vision, fundus examination (dilated using tropicamide eye drops) with direct and indirect ophthalmoscope and blood pressure. Optical Coherence Tomography (OCT) were done to ascertain the macular thickness. Routine urine analysis and biochemical investigations including blood urea, serum creatinine and serum uric acid were done. Patients were followed up after delivery and reassessed for persistence of fundus changes.

## Results

A total of 56 cases were included in the study. Majority of the participants i.e., 33(60%) were in 21-25 years of age group. Among the participants with PIH, 30(54.54%) belonged to multi gravida (**Table - 1**).

**Table - 1:** Distribution of study participants.

	No. of participants (%)
<b>Age group in Years</b>	
≤20	13(23.63%)
21- 25	33(60%)
>25	9(16.36%)
TOTAL	55(100%)
<b>Incidence of PIH in relation to parity</b>	
<b>Gravida</b>	
Primigravida	25(45.45%)
Multigravida	30(54.54%)
Total	55(100%)

When the participants were grouped according to their severity of hypertension, 54% patients fell in the category of mild preeclampsia, 33% in the

group of severe preeclampsia and 13% with eclampsia (**Table - 2**). Among the total participants, 25(45.5%) participants had normal fundus and 27(49.1%) had hypertensive retinopathy (**Table - 3**).

**Table - 2:** Grouping of patients according to severity of hypertension.

Severity of hypertension	No of participants (%)
Mild pre-eclampsia	16 (54%)
Severe preeclampsia	10(33%)
Eclampsia	4(13%)
Total	30

**Table - 3:** Fundus changes observed.

Fundus finding	No of participants (%)
Normal	25(45.5%)
Hypertensive retinopathy	27(49.1%)
Central serous retinopathy	2(3.6%)
Macular edema	1(1.8%)
Total	55(100%)

Of all the PIH patients with hypertensive retinopathy changes, 23.6% had grade 1 hypertensive retinopathy changes with narrowing of the retinal arterioles. 21.8 % had grade 2 changes, 3.6% had grade 3 and the rest 3.6% had

grade 4 changes. This study shows that maximum number of patients with hypertensive retinopathy had grade 1 and 2 changes (**Table - 4**).

Fundus findings and parity were compared and studied. PIH was found more in primigravidas in comparison to multigravidas. But the fundus findings had no correlation with parity. The difference between both was found to be statistically insignificant (**Table - 5, Table - 6**).

## Discussion

In the present study, hypertensive retinopathy changes (grade I and II) were seen in 69%. 1 of patients with pregnancy induced hypertension similar findings were reported by Reddy CS, et al. Among the 55 study participants with PIH, 25(45.45%) cases were in primigravida group and 30(54.54%) cases in multigravida group. Similarly in a study by Reddy CS, et al. reported that 43.4% belonged to primigravida group. In the current study 54% patients fell in the category of mild preeclampsia, 33% in the group of severe preeclampsia and 13% with eclampsia. Whereas in the study by Reddy CS, et al. Thirty (38.4%) patients had mild preeclampsia, 46 (59%) had severe preeclampsia and 2 (2.5%) had eclampsia [1].

**Table - 4:** Categorization of fundus based on the gravida.

Fundus finding	Primigravida n(%)	Multigravida n(%)	Total
Grade 1 HTN Retinopathy	7(25)	5(20)	12(23.6)
Normal	21(52.5)	4(26.7)	25(45.5)
Grade 2 HTN Retinopathy	7(17.5)	5(33.3)	12(21.8)
Grade 3 HTN Retinopathy	0	2(13.3)	2(3.6)
Grade 4 HTN Retinopathy	0	0	0
Central serous retinopathy	1(50)	1(50)	2(100)
Macular Oedema	1	0	1(1.8)
Total	40(100)	15(100)	55(100)

In present research 12 cases were recorded as grade 1 hypertensive retinopathy, grade 2 hypertensive retinopathy were recorded in 12 cases, 2 cases are found as grade 3 hypertensive retinopathy. No cases of exudative retinal

detachment were recorded. Exudative retinal detachment is seen rarely in PIH patients. It is thought to be caused by choroidal ischemia. Similarly in the study done by Reddy CS, et al. Retinal changes (hypertensive retinopathy) were

noted in 46 (59%) patients --- grade I in 41 (52.6%) and grade II in 5 (6.4%). The current study could not find any correlation between fundus finding and parity [11] 54.54% Patients were having retinal changes and hypertensive

retinopathy is noted In 30 cases were observed. Central serous retinopathy of 2 cases was recorded and 1 case of macular edema is noted, further management for patients are topical anti-inflammatory in macular edema case.

**Table – 5:** Chi-square tests for categorization of fundus based on the gravida.

	Value	DF	Significance (2 sided)
<b>Pearson Chi-Square</b>	9.2	5	0.101
<b>Likelihood Ratio</b>	9.35	5	0.096
<b>N (Normal)</b>	55		

**Table – 6:** Group statistics for levels of serum uric acid.

	Gravida coded	N	Mean	Std. Deviation	Std. Error Mean
<b>Sr.uric acid (mg/dl)</b>	<b>PRIMI</b>	40	6.3150	2.27399	.35955
	<b>MULTI</b>	15	5.9333	1.15984	.29947

### Conclusion

Pregnancy is a physiological state resulting in variation in all physiological and biochemical parameters in body. The current study showed fundus changes as a very good gauge for assessing the severity of hypertension and for differentiating between chronic hypertension and pregnancy induced hypertension. The most common fundus changes observed in current study were grade 1 and grade 2 hypertensive retinopathy; and grade 3 and grade 4 hypertensive retinopathy the least observed. Central serous retinopathy and macular edema were also noted. Primigravida are the group mostly effected by PIH. The retinal changes lead to poor visual and systemic prognosis, unless the pregnancy is terminated. After termination of pregnancy the resolution of retinal change is observed. The present study showed a correlation with the severity of hypertension and serum uric acid level. No correlation was found between fundus changes and age of patient. The findings of the study should be interpreted with caution due to the small sample size. Hence this study recommends PIH fundus examination is in all pregnancy cases. An equal importance should be given to case history taking on there is chance of relapsing retinal changes in PIH patients.

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