

A Clinical Study of Retinal Manifestations of Pregnancy Induced Hypertension among Patients Admitted in a Tertiary Care Hospital

Shyam Savith Varanasi¹, Erra Ramadevi², Bharat Kumar Jain³, Vepa Meenakshi⁴

¹Assistant Professor, Department of Ophthalmology, Rangaraya Medical College, Kakinada, Andhra Pradesh, India.

²Assistant Professor, Department of Ophthalmology, Andhra Medical College, Vizag, Andhra Pradesh, India.

³Assistant Professor, Department of Ophthalmology, Andhra Medical College, Vizag, Andhra Pradesh, India.

⁴Associate Professor, Department of Ophthalmology, Rangaraya Medical College, Kakinada, Andhra Pradesh, India.

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Corresponding author: Dr. Vepa Meenakshi

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Abstract

Background: Vascular endothelial dysfunction and its effects (generalised vasospasm and capillary leak) appear to be linked to the pathological alterations of this disease. Vasospastic symptoms can be reversed, and after delivery, the retinal vessels quickly return to normal health. The aim of this study is to find retinal changes corresponding with pregnancy induced hypertension. Early identification of PIH can prevent foetal and maternal problems.

Methods: The present observational cross-sectional study was conducted on 100 patient in the Department of Ophthalmology and Obstetrics & Gynaecology, Rangaraya Medical College, GGH, Kakinada from December 2019 to November 2021

Results: Out of 100 patients, 53 had gestational hypertension, 2 had mild preeclampsia, 14 had severe preeclampsia and 12 had eclampsia. And 63 patients had no retinal changes, 37 patients had retinal changes, 2 patients had macular edema and in 1 patient serous retinal detachment was seen.

Conclusion: The retinal vascular changes correlate with severity of hypertension. Fundus examination in patients with PIH is an important clinical evaluation to predict adverse fetal outcome. When Ophthalmoscopic examination is done carefully every day, it has proven to be of unquestionable value in the reduction of maternal mortality and foetal mortality.

Keywords: PIH (Pregnancy Induced Hypertension), Retinal Manifestations, Eclampsia, Maternal And Fetal Mortality.

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Introduction

Pregnancy induced hypertension (PIH), is commonest form of life-threatening

complications of pregnancy. PIH is a multisystem disorder affecting 6-8% of all

pregnancies and is a major cause of maternal and fetal morbidity and mortality [1]. Hypertension may be a representative of an underlying pathology which may be pre-existing or appears for the first-time during pregnancy [2].

Ocular involvement occurs in a majority of patients of PIH. Ocular examination of PIH patients not only aids in the diagnosis of eye disorders, but it also aids in determining the severity and course of the disease, treatment response, and final outcome or prognosis [3,4].

Fundoscopy is a simple non-invasive and cost-effective investigative procedure that can be performed in the out-patient department or at the bed side. Fundoscopy tells us the state of retinal blood vessels and the degree of vasospasm which as a guide to the severity of hypertensive disorders.

Aim of study

The aim is to research and study all the fundus changes occurring in women diagnosed with pregnancy induced hypertension.

Materials and Methods

The present observational cross-sectional study was conducted on 100 patient in the Department of Ophthalmology and Obstetrics & Gynaecology, Rangaraya Medical College, GGH, Kakinada from December 2019 to November 2021.

Inclusion criteria

All women diagnosed with pregnancy induced hypertension admitted in department of Obstetrics and Gynaecology, Government General Hospital.

Exclusion criteria

All pregnant women with

1. Chronic hypertension
2. Gestational diabetes mellitus

3. Pre-existing diabetes mellitus and renal disease

4. Pre-existing ocular diseases like glaucoma, uveitis, optic- neuropathy

5. Hazy media at fundus examination

6. Patients who refuse to give informed and written consent

Methodology

Informed consent was taken from the patients admitted in hospital for PIH and age, parity, gravida, gestational age and blood pressure were documented.

A detailed history of PIH signs and symptoms, such as recent onset of blurred vision and headache, was taken. The visual acuity of the participants was assessed. An anterior segment examination was performed at the bedside using Snellen's chart. In unstable cases, a torch light was used, and a slit-lamp examination was done in a stable environment.

Fundus examination was done using direct ophthalmoscope after instilling tropicamide 0.5% eye drops. Patients were advised punctal occlusion for 3min to avoid systemic absorption after closing eyes. After achieving adequate mydriasis, fundus examination was done.

Patients with retinal changes were followed and post-partum fundus examination was done.

Retinal changes observed were documented and analysed.

Study tools – Direct Ophthalmoscope, Indirect Ophthalmoscope, Slit-lamp biomicroscope, Snellen's Visual Acuity chart, Fundus camera.

Statistical Analysis

SPSS software was used for analysis and chi-square test was used to find association between various parameters.

A P-value of less than 0.05 was considered significant.

Observation

Table 1: Distribution of patients according to Age

Age Group (Years)	No. of Patients	Percentage
≤20	26	26
21-25	48	48
26-30	21	21
31-35	4	4
>35	1	1
TOTAL	100	100

In the present study of 100 patients, maximum number of PIH cases were found in the age group of 21 – 25 years that is 48%.

Table 2: Distribution of patients according to Parity

Gravida	No. of Patients	Percentage
G1	61	61
G2	27	27
G3	10	10
G4	2	2
TOTAL	100	100

PIH is most common in Primigravida. In this study of 100 patients, 61% were Gravida 1, 27% were Gravida 2, 10% were Gravida 3, and Gravida 4.

Table 3: Grouping of patients according to Grades of Hypertensive retinopathy

Retinal Changes	No. of Patients	Percentage
No changes	63	63
Grade 1	26	26
Grade 2	7	7
Grade 2 + retinal and macular edema	2	2
Grade 3	1	1
Serous retinal detachment	1	1
TOTAL	100	100

Out of 100 patients in this study, 63 had normal fundus, 26 had grade-1 changes, 7 had grade-2 changes, 2 had grade-2 changes with retinal and macular oedema, 1 had grade-1 changes and 1 patient had serous retinal detachment.

Table 4: Correlation between Age and Retinal changes

Age (years)	No changes		Grade 1		Grade 2		Grade2+ Retinal and macular edema		Grade 3		Serious retinal detachment		Total
≤20	15	57.7%	8	30.7%	2	7.7%	1	3.8%	0	0%	0	0%	26
21-25	30	62.5%	12	25%	3	6.2%	1	2%	1	2%	1	2%	48
26-30	14	66.7%	5	23.8%	2	9.5%	0	0%	0	0%	0	0%	21
31-35	3	75%	1	25%	0	0%	0	0%	0	0%	0	0%	4
>35	1	100%	0	0%	0	0%	0	0%	0	0%	0	0%	1
Total	63	63%	26	26%	7	7%	2	2%	1	1%	1	1%	100
P value = 0.988													

In this study maximum changes in the fundus were observed in the age group less than 25 years.

Table 5: Correlation between Parity and Retinal changes

	G1		G2		G3		G4		Total
No Changes	36	59%	18	66.6%	7	70%	2	100%	63
Grade 1	19	31.1%	5	18.5%	2	20%	0	0%	26
Grade 2	4	6.5%	2	7.4%	1	10%	0	0%	7
Grade 2+ Retinal and Macular Edema	1	1.6%	1	3.7%	0	0%	0	0%	2
Grade 3	0	0%	1	3.7%	0	0%	0	0%	1
Serous retinal detachment	1	1.6%	0	0%	0	0%	0	0%	1
Total	61		27		10		2		100

P value = 0.0088

In this study maximum changes (41%) were seen in first gravida (primi).

Table 6: Correlation between Hypertensive disorders and Retinal changes

	GHTN		Mild Preeclampsia		Severe Preeclampsia		Eclampsia		Total
No Changes	39	73.6%	12	57.1%	7	50%	6	50%	63
Grade 1	12	22.6%	6	28.6%	4	28.6%	4	33.3%	26
Grade 2	2	3.8%	1	4.7%	2	14.3%	1	8.3%	7
Grade 2+ Retinal and Macular Edema	0	0%	1	4.7%	0	0%	1	8.3%	2
Grade 3	0	0%	1	4.7%	0	0%	0	0%	1
Serous Retinal Detachment	0	0%	0	0%	1	7.1%	0	0%	1
Total	53		21		14		12		100

P value = 0.001

The majority of retinal abnormalities were identified in severe preeclampsia and eclampsia patients in this investigation. Eclampsia and severe pre-eclampsia patients have macular oedema and serous retinal detachment.

Corelation between Systolic Blood Pressure and Retinal Changes

Most of the retinal changes (74%) were seen when systolic blood pressure was ≥ 160 mm of Hg. And in all patients with systolic BP ≥ 170 retinal changes were seen.

Corelation between Diastolic Blood Pressure and Retinal Changes

In this study, most of the retinal changes were seen when diastolic blood pressure was ≥ 100 mm of Hg.

Discussion

The mean age of the patients was 23.64 years. Most of the retinal abnormalities were seen in the age group of <25 years. The P value was 0.988 which is insignificant indicating no relation between age and retinal changes.

Out of 100 patients, 53 had gestational hypertension, 2 had mild preeclampsia, 14 had severe preeclampsia and 12 had eclampsia.

Most of the patients were primigravida (61%). Maximum retinal alterations were seen in primigravida (41%) with a P value

of 0.0088 indicating higher incidence of retinopathy changes in primigravida.

Retinal changes were observed in 37 cases. Out of which 26 cases had grade 1 retinopathy changes, 7 cases diagnosed as grade 2 retinopathy changes, 2 cases had grade 2 changes with retinal and macular edema and one case suffered serous retinal detachment.

Cases with macular edema and with serous retinal detachment were advised immediate termination of pregnancy.

Out of 37 patients with retinal changes 14 had gestational hypertension, 9 were mild preeclampsia, 7 were severe preeclampsia and 6 were eclampsia patients.

In the present study, 42.9% of mild preeclampsia patients had retinal changes and 50% of severe preeclampsia and eclampsia patients had retinal changes.

Visual disturbance was seen in 3 patients, out of which 2 patients had retinal and macular edema. Another one patient had serous retinal detachment.

Reversal of retinal changes was seen by 14th day postpartum.

In the present study, most of the fundus changes were seen when the systolic pressure was ≥ 160 mm of Hg.

Every patient who had systolic blood pressure ≥ 170 mm of Hg had retinal changes.

It was found that there was increased incidence of retinal changes with an increase in systolic BP with a statistically significant P value of 0.000.

In the present study, retinal abnormalities were present when diastolic blood pressure was ≥ 100 mm of Hg.

It was found that there was increased incidence of retinal changes with an increase in diastolic blood pressure with a statistically significant P value of 0.000.

Grade 2 retinopathy with macular edema was present in patients with BP $\geq 170/110$ mm of Hg.

It was discovered in this study that there was a statistically significant link between retinal alterations and blood pressure measurements (P value 0.000).

This is comparable to Shah et al [5], Sagili Chandrasekhara Reddy et al [6], Tadin et al [7], Karki et al [8].

Thus in this study we tried to assess retinal changes in PIH, and visual acuity changes and relationship between retinal changes with blood pressure, parity, age and hypertensive disorders.

Conclusion

1. Daily Ophthalmoscopic examinations during hospital stay is important to the obstetricians in the management of patients with PIH.
2. The development of hypertensive retinopathy is directly related to the severity of hypertension.
3. It is relatively safe to allow patients with grade I and grade II hypertensive retinopathy to continue the pregnancy with treatment.
4. The pregnancy should be terminated in patients with retinal and macular edema, regardless of the gestational duration.
5. Early interruption of pregnancies result in more living babies even though some will be premature.
6. When Ophthalmoscopic examination is done carefully every day, it has proven to be of unquestionable value in the reduction of maternal mortality and foetal mortality.

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