

## STUDY OF FUNDUS CHANGES IN PREGNANCY INDUCED HYPERTENSION

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**Abstract**

**Background:** Hypertensive disorders in pregnancy are the most common medical complications affecting 7-15% of all pregnancies. Pre eclampsia remains one of the top five causes of maternal and perinatal mortality worldwide. The preeclampsia/eclampsia syndrome is a multisystem disorder that can involve cardiovascular, hematologic, hepatic, renal and neurologic systems along with the eye and visual pathways. **Aim:** To study prevalence and assess various retinal changes in pregnancy induced hypertension and to determine the association of various factors of toxemia of pregnancy with retinal changes which includes age, parity, blood pressure, proteinuria, and severity of the disease. **Methodology:** This is prospective observational hospital-based study. Total of 150 patients with a diagnosis of Pregnancy induced hypertension admitted in department of Obstetrics and Gynecology of our hospital were included in this study. Age, gestation period, gravida, level of blood pressure and proteinuria were noted. All Fundus findings were noted on Amsler grid. Indirect Ophthalmoscopy with 20D was used for funduscopy. **Results:** A total of 150 Pregnancy induced hypertension patient's fundus were examined. Mean age of patients was 25.1 years. The gestation period ranged from 20 weeks to 40 weeks; 34 (22.66%) patients had Grade 1 hypertensive Retinopathy, 04 (2.6%) patients had Grade 2 Hypertensive retinopathy; No signs of Hemorrhages or exudates or retinal detachment. **Conclusion:** Early ocular examination to assess severity of Pregnancy induced hypertension at regular intervals & timely intervention of time to prevent complications and improved outcome of pregnancy.

**Keywords:** Pregnancy induced hypertension, Gestational hypertension, Retinal changes, fundus changes.

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**Introduction**

Hypertensive disorders in pregnancy are the most common medical complications affecting 7-15% of all pregnancies. Pre eclampsia remains one of the top five causes of maternal and perinatal mortality worldwide[1]. The preeclampsia/eclampsia syndrome is a multisystem disorder that can involve cardiovascular, hematologic, hepatic, renal and neurologic systems along with the eye and visual pathways. Vascular endothelial damage leading to vasospasm, transudation of plasma, and ischaemic and thrombotic sequelae[1,2]. The incidence of preeclampsia in hospital practice varies from 5%-15%. The incidence is 10% in primigravida and 5% in multigravidae.<sup>(1,2)</sup> The hospital incidence of eclampsia in India ranges from 1 in 500 to 1 in 30 pregnancy[1]. It is more common in primigravidae (75%).

Ocular involvement is common in pregnancy induced hypertension, occurring in as many as 30-100% of these patients[3]. Study of eye can provide evidence of health or disease in other parts of the body and aid in diagnosis of systemic disease.

There is strong correlation between the blood pressure elevation and retinal arteriolar spasm[5,6]. Ocular fundus ophthalmoscopic examination is a non-invasive method of assessing the extent and severity of microvascular changes. Hence Ophthalmologist opinion is very valuable in diagnostic, therapeutic aspect of Pregnancy induced hypertension[4,6]. Funduscopy is a simple, non-invasive and cost effective procedure can be performed at ease of bedridden patient or in our out patient department.

**Aim:** 1. To study prevalence and assess various retinal changes in pregnancy induced hypertension  
2. And to determine the association of various factors of toxemia of pregnancy with retinal changes which includes age, parity, blood pressure, proteinuria, and severity of the disease.

**Material & methods**

A Prospective observational study was conducted among 150 patients with Pregnancy induced hypertension admitted at Navodaya medical college, hospital & research centre, Raichur. Ethical clearance was obtained from Scientific committee of College. Duration of this study was from August 2019 to December 2020. Informed consent was obtained before the interview and examination. Pregnant women with existing Diabetes, Chronic hypertension, Renal disease, Ocular diseases like Glaucoma, Optic neuritis and Uveitis, Ocular media opacities which precludes fundus examination. And patients refused to give

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consent. All details of patients were recorded. Blood Pressure was measured twice at an interval of 6 hours.

Ocular examination: Anterior segment examination was done using diffuse light. Fundoscopy: 1% tropicacyl eye drops were instilled in cul-de-sac. After instillation of eye drops patients were advised punctal occlusion for 3minutes after closing their eyes to avoid systemic absorption. Fundus examination was done after adequate mydriasis. Indirect Ophthalmoscopy done and recorded on amsler’s chart. Ocular findings were documented and

**Results**

observations were analysed. Hypertensive retinopathy was classified according to the Keith-Wagener-Barker(KWB) Classification[1,2]. Ocular findings were documented and observations were analysed. Data was entered in the Microsoft excel and analysed using SPSS v20. Chi square test was used to determine the association between various parameters. P value of < 0.05 was taken significant.

**Table 1: Distribution of the patients based upon the age group**

Age group in years	No of patients	Percentages
20-25	68	45.33%
26-30	63	42%
31-35	15	10%
36-40	04	2.67%

Mean age was years 25 years

**Table 2: Parity wise distribution in the present study (n=150)**

Gravida	No of patients	Percentage
G1	90	60%
G2	36	24%
G3	18	12%
G4	06	4%

**Table 3: Gestational age at the time of presentation (n=150)**

Period of gestation (In weeks)	No of patients	Percentage
20-24	27	18%
25-29	30	20%
30-34	45	30%
>34	48	32%

**Table 4: Distribution of patient according to Hypertensive disorder in pregnancy**

Hypertensive disorders	No of patients	Percentage
Gestational hypertension	90	60%
Pre-eclampsia	45	30%
Eclampsia	15	10%

**Table 5: Relationship between age & retinal changes in Pregnancy induced hypertension**

Age (years)	None	Grade I	Grade II	Macular odema	Total Patients	$\chi^2$ Value	P value
20-25	50	14	4	0	68		
26-30	45	17	0	1	63		
31-35	12	02	0	1	15		
36-40	03	01	0	0	04		
Total	110	34	04	02	150		

**Table 6 : Relationship between parity & hypertensive retinopathy**

Gravida	None	Grade I	Grade II	Macular odema	Total Patients	$\chi^2$ Value	P value
G1	61	25	02	02	90		
G2	29	05	02	0	36		
G3	16	02	0	0	18		
G4	04	02	0	0	06		
Total	110	34	04	02	150		

**Table 7: Relationship between Hypertensive disorders of pregnancy & retinal changes**

Hypertensive disorders	None	Grade I	Grade II	Macular odema	Total Patients	$\chi^2$ Value	P value
GHTN	88	02	0	0	90		
Pre-eclampsia	22	21	02	0	45		
Eclampsia	0	11	02	02	15		
Total	110	34	04	02	150		

**Table 8: Relationship between proteinuria and retinal changes in Pregnancy induced hypertension**

Proteinuria	None	Grade I	Grade II	Macular Odema	Total Patients	$\chi^2$ Value	P value
+	42	18	0	0	60	34.6	0.000
++	09	05	02	0	45		
+++	0	11	02	02	15		

### Discussion

This study was undertaken to evaluate the fundus changes in 150 patients with Pregnancy induced hypertension. Mean age is 25years comparable to shah et al (25.1yrs) and bandari et al (23.85yrs)

In study by shah et al, 50.67% were primigravidas & In study by Reddy et al, 55.3% were primigravida. In our present study, 60% are primigravidas indicates that primigravidas are more susceptible to hypertensive retinopathy.

In the present study prevalence of hypertensive retinopathy(26.6%) is higher than shah et al (12%), but lower than Tadin et al(45%). Comparatively lower grades of retinopathy (absence of hemorrhages, hard exudates, cotton wool spots and Retinal Detachment) can be attributed to good antenatal care & early detection and good management of hypertensive disorders of pregnancy.

In study by shah et al, 22.14% of patients with protenuira developed retionopathy. And Tadin et al found statistical correlation between proteinuria and hypertensive retinopathy In our study . Our Study too has statistically significant association between retinal changes and proteinuria (p value of 0.00005).

All PIH patients should undergo ophthalmoscopy as ocular fundus changes are important prognostic indicators of maternal disease , severity and maternal as well as foetal outcome.

In higher grades of retinopathic changes , earlier termination of pregnancy may be considered for safety of the mother.

Hypertension complicates 10% of all pregnancies[13]. Maternal mortality rate in pre-eclampsia and eclampsia is recorded upto 1.8% in developed countries[14]. Maternal mortality in eclampsia patients was observed as very high in India and this ranges varies from 2 to 30%[15], it was much more in rural setups than the urban areas. But, if they treated early and adequately, the mortality rate will be less than 2%. The changes related to retinal vascular which were observed have also been said to be correlated with the severity of hypertension. As per the literature search related to Pregnancy induced hypertension studies, the wellbeing related to fetus will be depends on it's placental circulation. It was observed that the vascular changes in placenta, indicated with the presence of changes may occurs in retinal arterioles/haemorrhages. So, the direct ophthalmoscopic observation to the mother's fundus may also results in the interpretation/report, which will be similar micro-circulation changes of placenta and it's indirectly to the fetus wellbeing. So, the fundus observation of during the pregnancy induced hypertension, will be the important clinical tool to predict/interpret the adverse fetal outcomes if any.<sup>16</sup>

### Conclusion

Early ocular examination is very must to assess severity of Pregnancy induced hypertension at regular intervals & timely intervention to prevent complications and improved outcome of pregnancy.

### Limitations

1. Fetal parameters like Intrauterine growth retardation , Birthweight, Premature birth, including Intrauterine deaths

were not considered which were consequences of pregnancy induced hypertension.

2. This study was conducted in tertiary care hospital with all facilities to manage from the time of diagnosis of Pregnancy hypertension to its complication. Study subjects were not representative of rural population.
3. Study included only 150 subjects.

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