

A Study of Association of Fundus Changes in Pregnancy Induced Hypertension

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ABSTRACT

Aims: To study the association of retinal changes in pregnancy induced hypertension (PIH) and its parameters like age, parity, and severity of the disease.

Subjects and Methods: This was a tertiary hospital based cross-sectional study. All the patients (117) admitted with diagnosis of PIH were included in this study. Age, gravida, gestation period, blood pressure, and severity were noted from the case records. After taking history for any eye symptoms, fundus examination was done after dilating the pupils with indirect ophthalmoscope in the ward itself to note the various fundus changes.

Results: Majority of the patients belonged to the age group 31-40 yrs (46.15%). Majority of the patients were primigravidas (47.86%). (20.51%) were second gravidas and (18.80%) and (12.82%) were third gravida and multigravida respectively. Fundus changes of PIH were present in 45(38.46%) patients. Most of the patients had mild eclampsia (53.85%) It was found that there was a statistically significant association of parity (P=0.002) and severity of PIH (P=0.00). But the age of the patient was not significant statistically (P=0.09) in our study.

Conclusion: Fundus examination in cases of PIH is of paramount importance in monitoring and managing cases as it co-relates with the severity.

KEYWORDS: Eclampsia, Fundus changes, Ocular manifestations, Ophthalmoscopy, Pregnancy Induced Hypertension (PIH), Pre eclampsia, Retinopathy.

INTRODUCTION

Amongst all the various systemic medical conditions associated with pregnancy, pregnancy induced hypertension (PIH) is the most common after anemia in pregnancy. As per standard textbooks in OBGY hypertensive disorder in pregnancy that occurs in the absence of other causes of elevated blood pressure (140/90mmHg or a rise of 30mmHg of systolic pressure or a rise of 15mmHg of diastolic pressure), taken on two occasions after rest, in combination with generalized edema and/or proteinuria is PIH (Williams) When there is significant proteinuria it is termed as preeclampsia; seizures or coma as a consequence of PIH is termed as eclampsia. The ophthalmic manifestations of PIH are conjunctival vasculopathy, hypertensive retinopathy, exudative retinal detachment, hypertensive choroidopathy. Retina is involved due to the basic pathology of vasospasm and deranged capillary permeability, the consequences of vascular endothelial

dysfunction. These changes are usually reversible and frequently proportional to the grade of severity of PIH (Duke -Elder S, 1971).¹ Rare complications like reversible cortical blindness and extra-ocular muscle palsy have been documented(Davis and Dana, 2000)² Important decision regarding conservative management verses induction /termination of pregnancy can be made with these fundus changes as one of the important parameters for consideration.

MATERIALS AND METHODS

This was a cross-sectional observational study done at a tertiary referral center over a period of 6months (1st August 2015 till 31st January). A total of 117 patient who met the inclusion criteria of PIH (>20 weeks of gestation with a BP of > 140/90, with proteinuria, with/without edema feet) and admitted to the antenatal ward were included in the study. The PIH was graded as

pre-eclampsia (mild and severe) and eclampsia.. All the patients were initially evaluated by an obstetrician. Detailed history, general physical examination and systemic examination were then done, followed by ocular evaluation which included visual acuity with Snellen’s chart and best- corrected visual acuity (BCVA) (in possible cases after refraction), ocular alignment and motility, pupillary examination and detailed slit-lamp examination (whenever possible). Fundus evaluation under mydriasis (plain tropicamide 1%) was performed. Fundus changes were grouped as: no changes, vascular changes, extra-vascular retinal changes (hemorrhages, cotton wool spots, hard exudates), optic nerve head changes and choroidal changes. Patients who had preexisting diabetes or hypertension or renal disease or hazy media which did not permit fundus visualization were excluded from the study. Hypertensive retinopathy changes seen in right or left or both eyes, was taken as positive findings in that patient. Age, parity, blood pressure, proteinuria were noted from the case records. The retinal changes (hypertensive retinopathy) were graded according to Keith Wagener classification into:

Grade I – mild generalized arterial attenuation, particularly of small branches;
Grade II – more severe grade I + focal arteriolar attenuation;
Grade III – grade II + haemorrhages, hard exudates, cotton wool spots;
Grade IV – grade III = optic disc swelling (papilloedema).
 The severity of PIH was classified into pre-eclampsia (mild and severe) and eclampsia, based on the following findings: Mild preeclampsia --- BP >140/90mmHg, proteinuria +, and/or mild edema of legs; Severe preeclampsia --- BP >160/110mmHg, proteinuria ++ or +++, headache, cerebral or visual disturbances, epigastric pain, impaired liver function tests, and increased serum creatinine; Eclampsia --- severe preeclampsia + convulsions. Proteinuria was tested using dipstix method and was graded as + = 0.3gm/L, ++ = 1gm/L, and +++ = 3gm/L. The results were analyzed using SPSS program. Chi-square test was used to determine the association between the retinal changes and blood pressure, proteinuria, and severity of PIH. A p value < 0.05 was taken as significant.

Table 1: Major Fundus Changes

Sr. No	Fundus Changes	No of Pateints	Percentages (%)
1.	Vascular Changes	30	66.67
2.	Retinal Changes	11	24.44
3.	Optic Nerve Changes	3	6.67
4.	Choroidal Changes	1	2.22

Table 2: Showing the association of retinopathy with different variables in patients with PIH

VARIABLES	RETINAL CHANGES GRADES					TOTAL	INFERENCE
	0	I	II	III	IV		
AGE							
<20	2	3	2	0	0	7	P value- 0.09 Not significant
21-30	32	15	13	1	0	51	
31-40	37	11	4	1	1	54	
>40	1	3	0	1	0	5	
PARITY							
Primi	29	24	2	0	0	56	P value- 0.002 Significant
G2	17	4	3	0	0	24	
G3	14	3	3	2	0	22	
>G4 Grand Multipara	12	0	1	1	1	15	
SEVERITY OF PIH							
Mild Pre Eclampsia	41	19	3	0	0	63	P value-0 Significant
Severe Pre Eclampsia	31	13	6	1	0	51	
Eclampsia	0	0	0	2	1	3	

RESULTS

117 patients were examined of which majority were in the age group of 31-40yrs. (46.15%). Only 5 patients were above 40 years of age (4.27%) whereas 7 were teenagers (5.98%). Fundus changes were detected in 45 patients (38.46%). 72 patients in our study did not have any retinopathy (61.53%).

Majority of the patients were primigravidas (47.86%). (20.51%) were second gravidas and (18.80%) and (12.82%) were third gravid and multigravidas respectively. Most of the patients had mild pre-eclampsia (53.85%). (43.59%) had severe pre-eclampsia whereas only 3

patients were eclamptic (2.56%). One patient of eclampsia had exudative retinal detachment which recovered spontaneously post-delivery. Of the 3 patients showing optic nerve changes 2 had frank papilloedema while one had early papilloedema changes of blurred nasal margins with visual acuity of 6/6 in both eyes.

It was found that there was a statistically significant association of parity ($P=0.002$) and severity of PIH ($P=0.00$) with the fundus changes detectable. However the age of the patient was not significant statistically ($P=0.09$) in our study.

DISCUSSION

One of the most common causes of morbidity and mortality in obstetrics is Pregnancy-induced hypertension.

117 patients were examined of which majority were in the age group of 31-40yrs. (46.15%). Only 5 patients were above 40 years of age (4.27%) whereas 7 were teenagers (5.98%). Fundus changes were detected in 45 patients (38.46%). 72 patients in our study did not have any retinopathy (61.53%). Age in our study ($P= 0.09$) was not associated with retinopathy changes ($P > 0.05$) which is similar to the results quoted by Reddy et al.³ Youngest patient was 17 year old while the oldest was 44years of age. None of the patients under 20 years of age had any severe retinopathy changes (grds III- IV).

Various authors have reported PIH changes in the visual system causing multitude of affections viz. focal or generalized narrowing of retinal arterioles, haemorrhages, exudates, peripapillary or focal retinal edema, serous retinal detachment⁴, isolated cases of acute ischemic optic neuropathy⁵, transient blindness^{6,7}, cortical blindness⁸⁻¹⁰, bilateral retinal detachment¹¹, exudative retinal detachment in one eye and severe macular edema in the other eye¹², retinal pigment epithelial lesions¹³, temporary decrease in vision secondary to severe retinal arteriolar spasm and retinal edema¹⁴, permanent blindness secondary to central retinal artery occlusion and optic atrophy¹⁵. Transient blindness associated in 1% to 3% of patients with eclampsia¹⁶, is improving with modern available diagnostic and treatment modalities. Optic atrophy secondary to retinal vascular involvement has been reported to cause visual impairment although rare^{14,17}. The commonest finding reported so far remains retinal arteriolar narrowing.¹⁸

In the present study, PIH changes were seen in 72 pts.(61.53%), while 45pts (38.47%) had various retinopathy changes the most commonest being grade I changes of generalized retinal arteriolar narrowing (27.35%).

Tadin et al. from Croatia had reported 45% of retinal changes in their study of 40 patients with PIH.¹⁹ Reddy et al. from Malaysia found 59% of retinal changes in their study of 78 patients.³ Karki et al. from Nepal have

reported 13.7% of fundus changes in their study of 153 subjects with PIH.²⁰ Rasdi et al. from Malaysia found prevalence of retinopathy of 21.5%²¹ Ranjan et al. from India found 40% of retinal changes in their study of 75 patients.²² Javadekar et al., from India observed retinal changes in 42% of patients of PIH.²³ Our incidence is similar to that reported by Reddy et al but higher than the other Indian studies. This is probably because our patients came from varied socio-economic background and ours is a referral center in Mumbai a cosmopolitan city with a lot of migrant population.

This is probably why we also encountered Grade III and Grade IV changes (2.56%), and (0.8%) in our study which were conspicuous by their absence in the studies reported by authors viz. Reddy et al from Malaysia, Karki et al., from Nepal and Jaffe and Schatz²⁴ from U.S.A.

In a study of 275 cases of preeclampsia and 125 cases of eclampsia, Reddy²⁵ from India has reported retinal changes in 53.4% preeclampsia and in 71.2% in eclampsia patients (over all 59%, 236 out of 400). The most common retinal change noted was narrowing of arterioles (45.7%, 183 out of 400 cases). He found that retinal changes were significantly more in patients with severe hypertension.

We found a strong association between fundus changes and pregnancy induced hypertension ($P=0$) statistically significant.

CONCLUSION

Regular fundus examination in all cases of PIH results in a proper assessment of the clinical status of the patient. It is a helpful diagnostic tool for prediction of severity and thereby improving the fetomaternal outcome by managing the pregnancy judiciously and providing timely termination.

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