OPHTHALMOSCOPIC CHANGES IN PREGNANCY INDUCED HYPERTENSION

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ABSTRACT

BACKGROUND

Pregnancy induced hypertension can have grave consequences for both mother and foetus. Ocular involvement is common in majority of cases of PIH. The ocular vascular changes have been said to correlate with the severity of hypertension and ophthalmic examination is very helpful for evaluation, diagnosis and prompt management.^(1,2)

MATERIALS AND METHODS

This study is a descriptive study. 93 patients identified with Pregnancy Induced Hypertension in the Outpatient Department of Obstetrics and Gynaecology and Department of Ophthalmology, Sri Siddhartha Medical College, Tumkur, were enrolled.

Inclusion Criteria: All the pregnant women diagnosed as PIH by the obstetrician.

Exclusion Criteria: Patients with pre-existing: a) Diabetes mellitus, b) Hypertension, c) Renal disease. Patients with any pre-existing ocular diseases.

RESULTS

A total of 93 patients of PIH were examined. Mean age of the patients was 21 - 40 years (30.5). Gestational period ranged from 20 - 40 weeks (30). Primigravidae 53 (56.9%) and Multigravidae 40 (43%). Retinal changes were seen in 32 (34.4%) patients. Grade 1 changes 30 (32.2%) patients, Grade 2 changes 1 (1.07%) and Grade 3 changes 1 (1.07%) patient.

CONCLUSION

Ninety three cases of PIH were studied, in which 34.4% of the cases showed retinal changes. This is comparable with various studies. Attenuation of arterioles was the first detectable and the most common retinal change. Majority of retinal changes were of Grade I retinopathy. Retinal changes progress with severity of PIH. Ocular examination reveals important objective information concerning the disorder. Also, we can consider presence of retinal changes to be an indirect marker of severity of PIH and of prognostic value.

KEYWORDS

Pregnancy Induced Hypertension, Preeclampsia, Eclampsia, Ocular Manifestations, Fundus Changes, Ophthalmoscopy.

HOW TO CITE THIS ARTICLE: Dhaval HR, Shah JS. Ophthalmoscopic changes in pregnancy induced hypertension. J. Evolution Med. Dent. Sci. 2018;7(10):1281-1283, DOI: 10.14260/jemds/2018/292

BACKGROUND

A Successful Pregnancy depends on the major adaptation in the maternal anatomy, physiology and metabolism. Even before conception, hormonal changes are initiated and they alter the physiology of the mother significantly and continues to maintain in the entire antenatal and immediate postnatal period.

Full understanding of these pregnancy induced alterations becomes necessary to differentiate them from abnormal alterations.²

Disorders of hypertension in pregnancy are the most common complications of pregnancy. The incidence of hypertensive disorders complicating pregnancy is about 5% to 10%. They constitute an important cause of morbidity and mortality in the maternal and prenatal groups.^(3,4)

MATERIALS AND METHODS

This study is a descriptive study. Patients identified with pregnancy induced hypertension in the Outpatient Department of Obstetrics and Gynaecology, Sri Siddhartha Medical College, Tumkur, were enrolled. Institute Ethical Committee approval and adhered to the tenets of the Declaration of Helsinki were taken.

Data was collected from patients attending the Outpatient Department of Ophthalmology, Sri Siddhartha Medical College after getting an Institution approved informed consent from them.

Inclusion Criteria- All the pregnant women who were diagnosed as PIH by the obstetrician.

Exclusion Criteria

Patients with pre-existing-

- Diabetes mellitus,
- Hypertension,
- Renal disease. Patients with any pre-existing ocular diseases.

The Patients will be grouped according to -

- Age.
- Parity.
- Severity of hypertension.
- Grade of ocular changes.

'Financial or Other Competing Interest': None.
Submission 16-01-2018, Peer Review 15-02-2018,
Acceptance 21-02-2018, Published 05-03-2018.

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DOI: 10.14260/jemds/2018/292

After taking a thorough history pertaining to eye symptoms, anterior segment examination is done with torch light and undilated fundus examination done with direct ophthalmoscope in obstetric ward.

Complete ocular examination including Visual acuity: distance vision with Snellen's chart and near vision with Jaeger's chart and colour vision with Ishihara's chart; pupillary reaction with direct, consensual and swinging flashlight test; slit lamp examination of eye and IOP measured with Schiotz tonometry was done.

Both pupils were dilated with 1% tropicamide drops and detailed fundus examination was carried out.

Statistical Analysis/ Statistical Software

Statistical software SPSS 18.0 was used for the analysis of the data and Microsoft Word and Excel have been used to generate graphs and tables. Chi-square test and Fisher's exact test were used to determine the association between retinal changes and blood pressure and severity of PIH. A $p < 0.05$ was taken as significant.

RESULTS

Age	Normal	Grade 1	Grade 2	Grade 3	Grade 4	P value
20-24 years	25	03	01	0	0	0.000 (HS)
25-29 years	27	13	0	0	0	
30-34 years	09	11	0	0	0	
>34 years	0	03	0	01	0	
Total	61	30	1	1	0	

Table 1. Comparison of Positive Retinal Changes with Age of Patients

Out of 93 cases, in 20 - 24 years' age group 25 cases (26.8%) shows normal retina, 3 cases (3.2%) shows Grade 1 changes and 1 case (1.07%) shows Grade 2 changes. In 25 - 29 years' age group, 27 cases (29%) shows normal retina and 13 cases (13.9%) shows Grade 1 retinal changes.

Parity	Normal	Grade 1	Grade 2	Grade 3	Grade 4	P value
Primi	45	08	01	0	0	0.00 (HS)
Multi	16	22	0	01	0	
Total	61	30	01	01	0	

Table 2. Comparison of Positive Retinal Changes with Patient's Parity

Risk of retinal changes is seen more in multigravida than primigravida. Out of 93 cases, 23 cases (24.7%) in multigravidae and 9 cases (9.6%) in primigravidae showed retinal changes.

Onset of Preeclampsia	Normal	Grade 1	Grade 2	Grade 3	Grade 4	P value
< 28 weeks	01	02	0	0	0	0.324
29-32 weeks	05	02	0	01	0	
33-36 weeks	45	20	01	0	0	
> 37 weeks	10	06	0	0	0	
Total	61	30	1	1	0	

Table 3. Comparison of Positive Retinal Changes with the Onset of Preeclampsia

Out of 93 cases, below 28 weeks of gestation 1 case (1.07%) showed normal retina and 2 cases (2.15%) showed Grade 1 retinal changes. In 33-36 weeks gestation, 45 cases (48.3%) showed normal retina, 20 cases (21.5%) showed Grade 1 changes and 1 case (1.07%) showed Grade 2 changes.

Severity of PIH	Normal	Grade 1	Grade 2	Grade 3	Grade 4	P value
Mild	40	10	0	0	0	0.04 (SIG)
Severe	21	20	01	01	0	
Total	61	30	1	1	0	

Table 4. Comparison of Positive Retinal Changes with Severity of PIH

Out of 93 cases, mild PIH group of 40 cases (43%) showed normal retina and 10 cases (10.7%) showed Grade 1 changes. In severe PIH group, 21 cases (22.5%) showed normal retina, 1 case (1.07%) showed Grade 1 changes, 1 case (1.07%) showed Grade 2 changes and 1 case (1.07%) showed Grade 3 changes.

DISCUSSION

The retinal vascular changes have been said to correlate with the severity of hypertension. Many studies have considered the progression of retinal vascular changes as a sign of increasing severity of PIH and have correlated them with foetal mortality.

These changes help as a guideline for obstetrician to effectively manage the pregnancy and for better outcome of pregnancy and to reduce the maternal and foetal mortality and morbidity. It helps in prompt obstetrical and medical management of PIH.^(3,4)

In present study, cases having ocular fundus changes were 34.4%. Mean age of the cases in our study was 27.85 ± 6.58 years. In a prospective cohort study conducted by Karki et al, it was found that mean age group of patients with retinal changes was 23.86 ± 5.51 years and without retinal changes was 24.36 ± 5.65 years.

In prospective study conducted by Shukla et al, they examined 20 cases of preeclampsia and eclampsia and noted incidence of retinal changes in 70% of the cases in different age groups. In their study, 60% cases were aged < 25 years.

Mean age group of patients in the present study matches with the studies by Karki et al and Shukla et al. Tadin et al in their retrospective study of 40 women with preeclampsia, 45% (18 cases) showed retinal changes. The average age of 40 patients was 29.1 ± 7.4 years. In a study by Jaeffe and Schatz, mean age of patients with preeclampsia was 28 years. Mean age of patients in studies by Tadin et al, Jaeffe and Schatz was higher than that of our study.^(5,6)

According to Duke Elder, the most common retinal change is attenuation of retinal arterioles, occurring in approximately 60% of patients with preeclampsia. In our study, thirty two cases (34.4%) showed arteriolar attenuation. Arteriolar attenuation was seen in 10 cases (10.75%) of mild PIH cases and 22 cases (23.6%) of severe preeclampsia.

Reddy et al found 6 cases (3%) with retinal haemorrhages and 6 cases (3%) with cotton wool spots belonging to severe preeclampsia. Naval et al found 1.5% of cases with cotton wool spots and retinal haemorrhage.

Francis et al found 5% of cases with cotton wool spots and retinal haemorrhage. In present study, we found 1 case

(1.07%) with retinal haemorrhage and cotton wool spots. Karki et al mentioned optic nerve head changes in 8 cases.

Shukla et al found 10% case of papilloedema. Decline in the percentage found in our study regarding papilloedema could be due to early and prompt obstetrical and medical management of PIH.

In our study, normal fundus findings were seen in 61 cases (65.5%). Grade I changes were seen in 30 cases (32.2%), Grade 2 changes in 1 case (1.07%) and Grade 3 changes in 1 case (1.07%).

Grades of Retinal Vascular Changes	Tadin et al (%)	Reddy et al (%)	Present Study (%)
Normal fundus	55	41.03	65.5
Grade 1	29	52.6	32.2
Grade 2	15	6.4	1.07
Grade 3	5	-	1.07
Grade 4	-	-	-
Table 5. Shows Grades of Retinal Vascular Changes in Various Studies			

In the study by Tadin et al, the percentage of occurrence of Grade I retinal vascular changes in PIH cases was similar to that of our study.

Reddy et al (2012) in their study found higher percentage of occurrence of Grade I retinal vascular changes (52.6%) as compared to our study. In the study by Reddy et al (2012), the percentage of occurrence of Grade II retinal vascular changes in PIH cases was higher than that of our study.

Tadin et al in their study found higher percentage of occurrence of Grade II retinal vascular changes (15%) as compared to our study. In the study by Tadin et al, the percentage of occurrence of Grade III retinal vascular changes in PIH cases was higher than that of our study.

Vision is important criteria to be seen in these patients including follow-up after delivery. Most cases of late onset severe eclampsia present with exudative retinal detachment, which usually resolves with termination of pregnancy.

Vision and the retinal findings documented need to be followed up after the termination of pregnancy and any residual optic nerve affection should be correlated. In some of the cases, optic nerve changes were seen.

CONCLUSION

Ninety three cases of PIH were studied, in which 34.4% of the cases showed retinal changes. This is comparable with various studies. Attenuation of arterioles was the first detectable and the most common retinal change.

Majority of retinal changes were of Grade I retinopathy. Retinal changes progress with severity of PIH. Ocular examination reveals important objective information concerning the disorder. Also, we can consider presence of the retinal changes to be an indirect marker of severity of PIH and of the prognostic value.

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