

CLINICAL STUDY OF FUNDOSCOPIC FINDINGS IN PREGNANCY INDUCED HYPERTENSION

Obstetrics & Gynaecology

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ABSTRACT

OBJECTIVES: To study the fundoscopic changes in pregnancy induced hypertension, prognostic factor and fetomaternal outcome. **MATERIALS AND METHODS:** A retrospective study in which all the patients for the study were selected from Department of Obstetrics and Gynecology, Sapthagiri Institute of Medical Science and research centre during the period of may 1st 2022 to 12th of June 2023. In every case detail obstetric history, general examination and relevant pathological investigations were carried out. In every case, pupil was dilated with homatropine (2%) eye drops and fundoscopic examination was done. **RESULTS:** In our study out of 130 cases of Pregnancy induced hypertension , there 54(41.5%) Gestational hypertension , 19 (14.6%)cases of mild preeclampsia , 50 (38.4%)cases of severe preeclampsia and 7 (3.7%)cases of eclampsia. Out of 130 cases retinopathy changes are more common in severe preeclampsia and eclampsia. Out of 54 cases of GHTN 2 (12%) have showed retinopathy changes. out of 7eclampsia cases only 4 (57.1%) have showed retinopathy changes. Among 11 mild preeclampsia cases 3(27.2%) cases have showed grade 1 retinopathy changes. Among 19 severe pre-eclampsia cases 3 (15.7%) have showed retinopathy changes. The incidence of preterm babies, intrauterine death, still birth and low birth weight infants is high in mothers having positive fundus changes. **CONCLUSION:** Fundoscopic examination reveals important objective information about pregnancy induced hypertension, furthers their accurate diagnosis and refines their management.

KEYWORDS

INTRODUCTION

Pregnancy hypertension is the one of the most common cause of maternal morbidity and mortality. Pregnancy-induced hypertension (PIH) is one of the most common complications of pregnancy and if not diagnosed early and treated appropriately, can lead to maternal and neonatal morbidity and mortality. In India, the incidence of eclampsia ranges from 0.17 to 3.7% [2-4], and maternal mortality from 2.2 to 23% of all women with eclampsia. [3-6]

Preeclampsia, the most common medical complication of pregnancy, is characterized by elevated systemic blood pressure ($>140/90$ mm Hg), proteinuria (>300 mg/24 hours), and generalized edema which appears after the 20th week of pregnancy. It occurs in 5%-10% of all pregnancies (1). Eclampsia is the medical word for preeclampsia that is exacerbated by a generalised tonic-clonic convulsion.

The pathological changes of this disease appear to be related to vascular endothelial dysfunction and its consequences (generalized vasospasm and capillary leak). Ocular involvement is common in PIH.[11-13]. Symptoms like headache, epigastric pain, blurring of vision, photopsia, scotoma, diplopia may be the precursor of seizures.[11-17] Progression of retinal changes correlates with progression of PIH and also with the fetal mortality due to similar vascular ischemic changes in placenta.[4-6] Vasospastic manifestations are reversible and the retinal vessels rapidly return to normal after delivery.

Pregnancy-induced hypertension results in vision-threatening illnesses like central retinal artery occlusion, central serous retinopathy, secondary optic atrophy, retinal detachment, macular tear, choroidal ischemia, central retinal vein occlusion, and haemorrhage.6 The most common retinal change observed was arteriole narrowing.

Ophthalmoscopy does not only helps in diagnosing the disease but repeated observations assist in assessing the severity, progress of disease, response to treatment if any and ultimate outcome or prognosis.[6,8-17,26]

The current study aimed to evaluate the ocular manifestations in women affected by pregnancy-induced hypertension (mild and severe

pre-eclampsia and eclampsia) presenting to a multi-disciplinary tertiary-level teaching hospital in Karnataka, India.

OBJECTIVE OF THE STUDY

To determine the association between ocular fundus changes with gravida, disease severity, maternal mortality and foetal outcome.

PURPOSE FOR THE STUDY

Pregnancy induced hypertension is a multisystem disorder, characterised by proteinuria, pedal edema, abnormal kidney and liver function tests. Since there exists a close relationship between retinal, cerebral, and renal vessels, fundoscopy gives the opportunity of observing the changes in the vascular tree.

MATERIALS AND METHOD

A Retrospective study , single centre Hospital based surveillance among pregnant women with hypertension disorder delivered in the department of Obstetrics and Gynaecology, Sapthagiri Institute of Medical Science and Research Centre, Bangalore from May 1st 2022 to June 12th 2023. 130 pregnant women with hypertension disorder in pregnancy were observed.

INCLUSION CRITERIA

All patients diagnosed with pre-eclampsia (mild and severe) or eclampsia, admitted to the obstetrics ward and willing to participate in the study, were included.

EXCLUSION CRITERIA

Patients with a history of chronic hypertension, pre-existing diabetes mellitus, renal disease, hematological disease, infectious disease, thyroid disease, HIV, hepatitis B surface antigen (HBsAg), prior ocular pathologies, and those who didn't wish to participate in the study were excluded from the study.

STUDY PROCEDURE

In every case, detail obstetric history including a detail antenatal history was taken. General examination and relevant pathological investigations like routine blood count, HIV, HBsAg, renal function tests, etc., were carried out. In every case, pupil was dilated with homatropine (2%) eye drops. Then detailed ophthalmic examination

was carried out with special emphasis on direct ophthalmoscopy apart from visual acuity of both eyes and anterior segment examination.

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).

Chi-square test was used to determine the association between the retinal changes and blood pressure, proteinuria, and severity of PIH. A value <0.05 was taken as significant. This research project was approved by ethical committee.

STATISTICAL ANALYSIS:

The data collected was entered into Microsoft excel worksheet 2010 and analysis was performed using stata for calculation of probability value.

RESULTS: In our study out of 130 cases of Pregnancy induced hypertension, there were 54 (41.5%) Gestational hypertension, 19 (14.6%) cases of mild preeclampsia and 50 (38.4%) cases of severe preeclampsia and 7 (3.7%) cases of eclampsia. Out of 130 cases retinopathy changes are more common in severe preeclampsia and eclampsia. Out of 54 cases of GHTN 2 (12%) have showed retinopathy changes. out of 7 eclampsia cases only 4 (57.1%) have showed retinopathy changes. Among 11 mild preeclampsia cases 3 (27.2%) cases have showed grade 1 retinopathy changes. Among 19 severe pre-eclampsia cases 3 (15.7%) have showed retinopathy changes. The incidence of preterm babies, intrauterine death, still birth and low birth weight infants is high in mothers having positive fundus changes.

Table No1. Retinal changes in pregnancy induced hypertension

GRADES OF RETINOPATHY	NUMBER OF PATIENT WITH CHANGES	PERCENTAGE
No change	117	90%
Grade 1	4	30.7%
Grade 2	6	46.1%
Grade 3	3	23%
Grade 4	0	0%

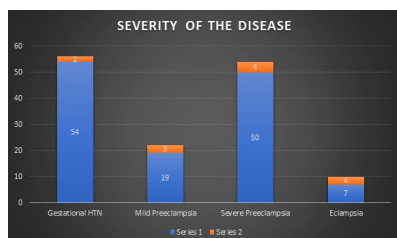


Table No2. Relationship between total number of cases of PIH and fundus changes according to age

Age (years)	Total cases of PIH	Cases of positive fundus changes (%)
UP TO 20 YEARS	4(3.07%)	1
21-25 YEARS	67(51.5%)	6
26-30 YEARS	42(32.3%)	3
31-35 YEARS	14(10.7%)	2
>35 YEARS	7(5.3%)	1
TOTAL	130	13

Table 03: FUNDUS CHANGES ACCORDING TO GRAVIDA

GRAVIDA	NORMAL FUNDUS	POSITIVE FUNDAL CHANGES
PRIMIGRAVIDA	78	9
MULTIGRAVIDA	39	4
TOTAL	117	13

DISCUSSION:

The retina is a unique location where the vasculature of the human body can be seen directly with an ophthalmoscope. Hence, a change in retinal arterioles indicates the similar state of placenta, provides the reasonable idea for placental circulation and fetus health.

According to a study on fundus changes in PIH by Nupur Pednekar et al. (12), The largest percentage of patients in the 20–30 year age range. In our study 83.8% of the total number of patients ranges between 20–30 years.

Our study shows 96 women (73.8%) were primigravida and the remaining 48 (36.9%) were multigravida, which is consistent to the results of the study by Upadhyaya D et al. The incidence of PIH is more common in primipara and second gravida than multigravida because the young retinal arterioles are more sensitive to high blood pressure.

The multigravida women are aware of complications of pregnancy and so they attend antenatal clinic regularly. The second high peak was seen in patients having multiple pregnancies.

The majority of the patient with hypertensive disorder were primigravida. The study by Reddy SC et al revealed a majority of primigravida in hypertensive disorder in pregnancy.

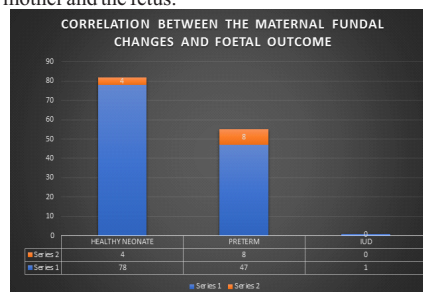
In our study, 4 patients out of 13 positive fundus cases patients i.e. 30.7% had grade I hypertensive retinopathy. 6 (46.1%) had retinal changes that corresponded to grade II hypertensive retinopathy. 3 (23%) individuals were observed to have grade III and none of them had grade IV retinal changes respectively. S.C. Reddy et al.'s study (5) found that grade I hypertensive retinopathic changes were evident in 52.46 percent of patients with hypertension disorders of pregnancy and grade 2 changes were present in 6.4% of patients. The proportion of females included in the grade 1 category of fundus changes was comparable because the majority of patients lie in this category of retinal changes.

In our study shows 54 Gestational Hypertension, 19 Mild preeclampsia, 50 Severe pre-eclampsia, 7 Eclampsia cases. Our study shows similarities with the study by Prachakvej et al. which studied 17 cases of toxemia of pregnancy comprising of 2 cases of mild preeclampsia, 8 cases of severe preeclampsia and 7 cases of eclampsia. There is an increase incidence of pre-term babies, still births, intra uterine death, intra uterine growth restriction and low birth weight babies in patients with positive fundus changes. This high incidence is probably due to placental insufficiency; short gestation period; socio-economic status; nutritional and intrauterine environment; chronic hypertension; birth trauma, infections, increased parity; chronic maternal disease and genetic influence are responsible for increased perinatal mortality. Bakhda RN found that the incidence of preterm and IUD was high in pregnancies having positive fundus changes.

The high incidence of perinatal mortality is due to pre-term deliveries; intra-uterine death, still birth. In severe preeclampsia, Grade III retinopathy termination should be performed at the earliest possible time irrespective of estimated weight of the fetus. Retinal detachment and papilloedema are indication for termination of pregnancy.

CONCLUSION

Ocular complications are frequent in pregnancy-induced hypertension, with retinal vascular alterations being the most prevalent. While the advancement of fundus changes indicates a worsening of pregnancy-induced hypertension (PIH), it may not necessarily correlate with systemic blood pressure levels. Furthermore, these visual changes are correlated with fetal mortality. Consequently, any visual alterations could serve as indicators for swift intervention, as they may mirror ischemic vascular changes occurring in the placenta. Ocular involvement holds promise as a prognostic factor in PIH. Nevertheless, frequent monitoring, early detection, and timely intervention are crucial for ensuring favorable outcomes for both the mother and the fetus.



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