PREVALENCE OF FUNDUS CHANGES IN PREGNANCY INDUCED HYPERTENSION – A CLINICAL STUDY

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Abstract:

To evaluate prevalence of fundus changes in Pregnancy Induced Hypertension (PIH) and to find the correlation of the findings with the levels of hypertension and with the severity of the disease.

METHOD: It was hospital based cross sectional study conducted at GMC Jammu, Upgraded department of ophthalmology over a period of one year from June 2017 to June 2018. 90 patients with diagnosed PIH with period of gestation of 24 weeks or above, were enrolled in the study. Patients having pre-existing hypertension, coexisting diabetes mellitus, severe anaemia, renal disease and ocular diseases like cataract or corneal opacities were excluded from the study. After taking consent and ocular history, anterior segment was evaluated. Pupils were dilated with 0.5% tropicamide eye drops and fundus examination was done with direct, indirect ophthalmoscope. Information like age, para, BP etc., was taken.

RESULT: Total 90 patients of PIH studied. 58 patients (64.42%) were primigravidae and 32 patients (35.55%) were multigravidae. Fundus findings were observed 28 patients (31.11%). 20 patients (22.22%) had grade I changes, 6 patients (6.66%) had grade II changes, 2 patients (2.22%) had grade III changes. Degree of retinopathy correlates with severity of disease and blood pressure levels.

CONCLUSION: The prevalence of fundus changes in PIH in this study is 31.11%. Fundus examination should be done in all cases of PIH that in turn prevent other complications.

KEYWORDS: PIH, PREGNANCY, HYPERTENSION, PREECLAMPSIA, FUNDUS CHANGES

Introduction

Pregnancy Induced Hypertension (PIH) comprises of Gestational hypertension, Pre-eclampsia and Eclampsia. (1) Gestational hypertension define as development of blood pressure of 140/90mm of Hg or more after twenty weeks of gestation without proteinuria. Preeclampsia is a disease that include an elevated blood pressure and proteinuria after 20 weeks of gestation and sometimes an associated coagulation abnormality or liver disease. If coma or convulsions associated with preeclampsia then it is term as eclampsia.

Hypertension is the primary sign. Oedema initially occurs in the lower legs that may progress to massive oedema . Proteinuria is defined as 300 mg or more of protein in a 24 hour urine sample(2) or 100mg/dl or

more in atleast two or more random samples that are collected six or more hours apart.

Eclampsia is life threatening condition. Single or multiple seizures each lasting approximately for a minute may be followed by a coma of varying duration. Multiple organs involvement occurs in PIH. Cardiovascular effects include increased cardiac output and hemoconcentration. Renal function abnormalities include decreased GFR (glomerular filtration rate) and sodium retention. Hepatic dysfunction and platelet abnormalities may occur. Neurological involvement includes headache and drowsiness, hemiplegia and coma. The visual system involvement in PIH is due to the severe toxemia. The most common abnormality seen is narrowing of the retinal vessels. (3) The arteriolar constriction requires some days to develop and then last for weeks to

months. It occurs due to a toxin that irritates the vessels and predicts state of vessels in the brain and in the kidneys of similar size. Vasospastic manifestations are reversible and the retinal vessels rapidly return to normal after delivery (4)

The choroid is also affected in the disease causing choroidal ischemia and infarction. Ischemia of the optic nerve and of the occipital lobe can also occur and recovery usually takes place if there is no significant infarction

Visual disturbances rarely be the presenting symptom. Less common symptoms include amaurosis, photopsia, scotoma, diplopia, chromatopsia and hemianopia. Vision threatening conditions involve central retinal artery occlusion, secondary optic atrophy, central serous retinopathy, retinal detachment, central retinal vein occlusion, choroidal ischemia and haemorrhage. Spontaneous vitreous haemorrhage may occur in cases of HELLP (Hemolysis, Elevated Liver enzymes, Low Platelet count) syndrome.

MATERIALS AND METHODS:

STUDY PERIOD: June 2017 to June 2018. Study was done at GMC Jammu, Upgraded department of ophthalmology for period of 12 months.

STUDY DESIGN: Cross sectional, Observational study.

SAMPLE SIZE: 90 patients

INCLUSION CRITERIA:

All cases having diagnosed PIH with period of gestation 20 weeks and above.

EXCLUSION CRITERIA:

- Pre-existing hypertension
- Coexisting diabetes mellitus, severe anaemia, connective tissue disorders
- Associated ocular disease like high myopia
- Ocular disease where fundus examination difficult like cataract and corneal opacities were excluded.

METHODS:

Informed consent was taken from all patients. After consent, detailed history of eye symptoms taken, visual acuity was evaluated by using Snellens chart. A visual acuity of 6/9 or better was considered normal. Anterior segment was then evaluated with torch light at bed side followed by fundus examination. Pupils

were dilated with 0.5% tropicamide eye drops. Fundus examination was done by using direct and indirect ophthalmoscope and grading of retinopathy in one or both eyes were taken as positive. 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)(5)

For stable patients that could be mobilized slit lamp biomicroscopy (with 90 D lens) done and fundus photographs were taken. The severity of PIH was classified into gestational hypertension, preeclampsia (mild and severe) and eclampsia.

1. Gestational hypertension - BP > 140/90 mm Hg without proteinuria

2. Mild preeclampsia - BP > 140/90 mmHg, proteinuria +, with or without mild edema of legs

3. Severe preeclampsia - BP > 160/110 mmHg, proteinuria ++ or +++, headache, cerebral or visual disturbances, epigastric pain, impaired liver function tests, and increased serum creatinine.

4. Eclampsia - severe preeclampsia + convulsions or coma.

Grading of proteinuria was done as + = 0.3 gm/L, ++ = 1 gm/L, and +++ = 3 gm/L

RESULTS:

Out of 90 patients that were studied, the age ranged from 24-30 years with mean age of 27 +3 years. Out of 90 patients, 58 patients (64.42%) were primigravidae and 32 patients (35.55%) were multigravidae. 14 patients (15.55%) had gestational hypertension, 46 patients (51.11%) had mild preeclampsia, 23 patients (25.55%) had severe preeclampsia and 7 patients (7.77%) had eclampsia. Majority of patients were asymptomatic. Headache was reported in 22 (24.4%) cases. Blurring of vision (transient) was reported in 2 (2.2%) patients. The visual acuity was found to be normal (6/9 or better) in 86 cases (95.55%). The visual acuity in remaining 4 cases (4.44%) was less than 6/9 but complete loss of

vision was not noticed in any patient. Out of 90 patients, 62 patients had no change in fundus (68.88%). Fundus changes were observed in 28 cases (31.11%). No changes were seen in 62(68.88%) patients. Grade I changes were seen in 20(22.2%); Grade II changes were in 6 (6.7%); Grade III were in 2 (2.22%) and no changes of Grade IV were seen.

DISCUSSION:

In present study, grade I and II hypertensive retinopathy changes were observed in 26 patients with pregnancy induced hypertension. Grade III changes were observed in 2 patients in this study. Grade IV changes were not observed in any patient.

Rasdi et al (6) studied group of patients having hypertensive disorders of pregnancy (gestational hypertension, chronic hypertension, preeclampsia/eclampsia, chronic hypertension with superadded preeclampsia/eclampsia) concluded that the retinal changes were observed in 21.5% (5 out of 28 patients) of preeclampsia/eclampsia, generalized arteriolar narrowing (5/28), haemorrhage (1/28), cotton wool spot (1/28) and serous retinal detachment (1/28). Further, observed resolution of all retinal changes during postpartum period except narrowing of arteries.

The most common fundus abnormality is narrowing of retinal arterioles (4). Various abnormalities in the fundus of patients of preeclampsia and eclampsia include focal or generalized narrowing of retinal arterioles, haemorrhages, exudates, peripapillary or focal retinal edema, serous retinal detachment(7), isolated cases of acute ischemic optic neuropathy(8), transient blindness(9),(10) bilateral retinal detachment(11), exudative retinal detachment in one eye and severe macular edema in the other eye(12), retinal pigment epithelial lesions(13), temporary decrease in vision secondary to severe retinal arteriolar spasm and retinal edema(14), permanent blindness secondary to central retinal artery occlusion and (15) optic atrophy. Although transient blindness reported in 1% to 3% of patients with eclampsia, but present incidence is probably much lower due to adequate management. Optic atrophy due to retinal vasculature involvement is not so common but it may cause visual impairment (14,16)

Tadin. I. et al (17) from Croatia studied 40 patients with PIH and reported 45% patients had retinal changes. They found statistical correlation between proteinuria, blood pressure and hypertensive

retinopathy. They concluded that degree of retinopathy was directly proportional to severity of preeclampsia and hypertensive retinopathy is prognostic factor in determining severity of preeclampsia. In our study, the prevalence rate of fundus changes found to be 23.33% lesser than that found in Tadin I et al study (45%). Reddy et al (18) studied 275 cases of preeclampsia and 125 cases of eclampsia found an incidence of 53.4% in preeclampsia and 71.6% in eclampsia of hypertensive retinopathy. The prevalence rate in our study is lower. S.C. Jaffe and Schatz (19) from USA have reported significant correlation between the reduction in arteriole to vein ratio, number of focal arteriolar constrictions and severity of preeclampsia. They did not find any haemorrhages, exudates, cotton wool spots, or retinal detachment in their study of 17 mild preeclamptic and 14 severe preeclamptic patients. Karki et al (20) have reported 13.7% of fundus changes in their study of 153 subjects with PIH. The prevalence rate found in present study is higher. The prevalence rate in present study was lower might be due to the fact that the pregnant women were undergoing routine prior antenatal checkups and had taken treatment for hypertension, if given. The incidence of grade III changes observe in present study not consistent with some studies where no or less incidence of grade III changes had been reported might be due to the reason that few cases from remote areas are presenting at hospital with severe preeclampsia and eclampsia at term gestation without prior antenatal checkups.

LIMITATIONS OF THE STUDY.

1. The study included only those patients at 20 weeks of gestation and above, those presenting earlier with more severe form of the disease even with fundus changes and whose pregnancy would be terminated might have been missed.
2. Postpartum followup not done in this study.

CONCLUSION.

Visual symptoms are less or absent in PIH patients unless the macula is involved. Sudden onset of headache, that is resistant to routine therapy consider as warning symptom before the onset of first convulsion. The presence of multiple hard exudates in fundus may indicate albuminuric retinopathy and chances of damage to the kidneys. Presence of papilloedema in the eyes may indicate

raised intracranial tension and such patients may develop convulsions. There is significant correlation with the severity of disease and the level of hypertension. Most of the fundus changes in PIH are underdiagnosed. Timely fundus evaluation should be done in all cases of PIH as it affect decision of induction of delivery, thereby preventing other complications. In patient of toxemia of pregnancy, the retinal changes usually revert as blood pressure decreases and may disappear completely after delivery due to lack of placental toxins. Therefore, by repeated fundus examinations at regular intervals one can do assessment of severity of disease and response to treatment given. In spite of the increased awareness among patients regarding their health and the need for routine examinations and institutional deliveries in pregnancy and an improvement in management of Pregnancy Induced Hypertension, complications like serous retinal detachment that cause ocular morbidity in pregnancy are less.

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