Research Paper

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Clinical Study of Ophthalmic Manifestation of Pregnancy Induced Hypertension in a Rural Setting in Central India

Medical Science

KEYWORDS : hypertension, fundus, pregnancy induced hypertension, eclampsia.

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ABSTRACT

The following study was done to evaluate the ocular morbidity in patients with pregnancy induced hypertension (PIH) and role of ocular symptoms in the early diagnosis of the disease was assessed. 100 patients admitted for PIH were the study sample form that ocular history was taken and anterior segment evaluation and fundus examination was done. Results showed patients with pre eclampsia, fundus on examination had shown changes which corelated with the severity of the disease and levels of hypertension. Changes were significantly associated with severe hypertension, severe proteinuria and severity of the disease.

Introduction –

The term 'Pregnancy Induced Hypertension' includes Gestational hypertension, Pre-eclampsia and Eclampsia. Gestational hypertension includes the development of a blood pressure of 140/90mm of Hg or more after twenty weeks of gestation without proteinuria. Pre- eclampsia is a disease characterised by an elevated blood pressure and proteinuria after 20 weeks of gestation and sometimes an associated coagulation abnormality or liver disease. If coma or convulsions occur in addition it is termed eclampsia. It is seen in 10% of pregnancies and is more common among primiparae. The cause of PIH remains obscure. Theories include immunological mechanisms, genetic predisposition, dietary deficiencies, increased free radical damage and endothelial dysfunction[1-3].

Visual system involvement is due to the severe toxaemia. The pathological changes of this disease appear to be related to vascular endothelial dysfunction and its consequences (generalized vasospasm and capillary leak). The retinal vascular changes generally, but not always, correlate with the severity of systemic hypertension. . The arteriolar constriction may take some days to develop and may last for weeks to months.Vasospastic manifestations are reversible and the retinal vessels rapidly return to normal after deliver. The choroid is also frequently affected in the disease. There occurs choroidal ischemia and infarction. Ischemia of the optic nerve and of the occipital lobe may also occur and recovery usually occurs unless there is significant infarction[4,5,10].

Rarely visual disturbances may be the presenting symptom. Other less common symptoms include amaurosis,photopsia,scotomata, diplopia, chromatopsia and hemianopia. The abnormalities of the retina and the retinal vasculature are most frequent though the conjunctiva, choroid, optic nerve and the visual cortex may be affected. Vision threatening conditions involve central retinal artery occlusion, secondary optic atrophy, macular tear, central serous retinopathy, retinal detachment, central retinal vein occlusion, choroidal ischemia and haemorrhage[6,7,11].

There is paucity of data available in the published literature on the prevalence of retinal changes in PIH. Therefore, this study was under taken to determine the prevalence of retinal changes in PIH and association between the retinal changes and blood pressure, proteinuria, and severity of the disease.

AIM – To study the ocular morbidity in patients of pregnancy induced hypertension and the role of ocular symptoms in the early diagnosis of the disease.

As these ocular findings were parallel to those of the vascular systems elsewhere in the body, the fundus findings would serve as a tool in assisting the obstetrician in order to assess the severity of the disease[8,9].

MATERIALS AND METHOD :

STUDY PERIOD – February 2015 to February 2016.

STUDY POPULATION – Patients admitted in the wards of AVBRH, JNMC, Sawangi, Wardha with diagnosed pregnancy induced hypertension.

TYPE OF STUDY – Prospective, cross sectional, non interventional study.

SAMPLE SIZE – 120 patients.

INCLUSION CRITERIA –All cases of diagnosed pregnancy induced hypertension within 25-41 weeks of gestation.

EXCLUSION CRITERIA: Pre- existing hypertension, coexisting diabetes mellitus, severe anaemia, connective tissue disorders, and cases with ocular disease like high myopia, cataract, corneal opacities were excluded.

METHOD –

After taking history for any eye symptoms, anterior segment was examined and visual acuity determined using Snellen's chart on the bedside itself. Both pupils were dilated with 1% tropicamide eye drops and fundus examination was done with direct ophthalmoscope in a semi dark room in the ward. Hypertensive retinopathy changes seen in right or left or both eyes, was taken as positive findings in that patient. Age, race, para, gravida, blood pressure, proteinuria were noted from the case records. The PIH was graded as preeclampsia (mild and severe) and eclampsia. All the findings were noted on a data sheet.

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 with arteriovenous crossing changes; Grade III – grade II + haemorrhages, hard exudates, cotton wool spots; Grade IV – grade III = optic disc swelling (papilloedema)[7].

Pregnancy induced Hypertension (PIH) was classified according to severity into:

1) Gestational hypertension - BP> 140/90 mm Hg without proteinuria;
2) Preeclampsia (mild and severe): Mild preeclampsia - BP >140/90mmHg, proteinuria +, with or without mild edema of legs; Severe preeclampsia - BP >160/110mmHg, proteinuria ++ or +++, cerebral or visual disturbances, epigastric pain, impaired liver function tests, and increased serum creatinine.
3) Eclampsia - preeclampsia+convulsions/coma.

Proteinuria was tested using the dipstix method and graded as + = 0.3gm/L, ++ = 1gm/L, and +++ = 3gm/L, +++++=10gm/L[1].

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. This study is adhered to the tenants of declaration of Helsinki and approved by institutional ethical committee of DMIMSU.

RESULTS –

Table 1:AGE DISTRIBUTION: A total of 120 patients were studied. The age ranged from 18-32 with a mean of 23.56 years. 20 cases (16.67%) belonged to < 20 years age group; 96 (80%) were in the 21-30 years group and 4cases were in > 30 years group(3.33%).There was no significant effect of extremes of age (<20 or > 30) on the degree of changes (p=0.24).

Age Group (Number)	With changes	Without changes
<20 (20)	9 (45%)	11(55%)
21 – 30 (96)	36(37.5%)	60(62.5%)
>30 (4)	4(100%)	0

Table 2:GRAVIDA DISTRIBUTION: Most of the cases, 84 (70%) were primigravidae and 36 (30%) were multigravidae. A significant association of changes was found in association with primigravidae. (p=0.01)

Gravida (Number)	With changes	Without changes
Primigravida (84)	40 (47.6%)	44 (52.4%)
Multigravida (36)	9 (25%)	27 (75%)

Table 3: SEVERITY OF DISEASE: 11 (9.17%) had gestational hypertension, 44 (36.7%) had mild preeclampsia, 43 (35.83%) had severe preeclampsia and 22(18.33%) had eclampsia. A significant association was found with the severity of disease (p=0.0003).

Severity of disease	With changes	Without changes
Gestational HTN	0	11 (100%)
Mild pre eclampsia	8 (18.18%)	36 (81.81%)
Severe pre eclampsia	31 (72.1%)	12 (27.9%)
Eclampsia	10 (45.45%)	12 (54.54%)

Table 4: FUNDUS CHANGES: 71 cases had no change (59.16%). Fundus findings were seen in 49 cases (40.84%).

Fundus changes	Number (Percentage)
No changes	71 (59.16%)
Grade I changes	32 (26.67%)
Grade II changes	13 (10.83%)
Grade III changes	2 (1.7%)
Grade IV/ Serous Retinal Detachment	2 (1.7%)

Table 5:Association of retinopathy with different variables in patients with pregnancy induced hypertension –

Parameter	Retinal Changes					Total
	Nil n=71	Gd I n=32	Gd II n = 13	Gd III n = 2	Gd IV n = 2	
Blood pressure						
<150 mmHg systolic <100 mmHg diastolic	49	20	4	1	0	74
>150 mmHg systolic >100 mm Hg diastolic	22	12	9	1	2	46
Proteinuria						
+	47	18	0	0	0	65
++	24	6	5	0	0	35
+++	0	8	8	2	2	20

The association between retinal changes and different parameters is shown in Table 5. There was statistically significant positive association between the presence of retinal changes and blood pressure, proteinuria.

Discussion –

PIH also called as toxaemia of pregnancy, is a common cause of maternal mortality, especially in developing countries.

Tadin. I. et al[24] from Croatia had reported 45% of retinal changes in their study of 40 patients with PIH. They found a statistical correlation between proteinuria, blood pressure and hypertensive retinopathy. The degree of retinopathy was directly proportional to severity of preeclampsia. They stated that hypertensive retinopathy is a valid and reliable prognostic factor in determining the severity of preeclampsia. The prevalence rate of fundus changes found in our study, 49% was similar to that found in Tadin.et.al study (45%); with similar statistical correlation with blood pressure and severity of disease of hypertensive retinopathy.

Jaffe and Schatz[22] 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.

In a study of 275 cases of preeclampsia and 125 cases of eclampsia, Reddy 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.

S.C. Reddy et al[16] studied 78 cases with PIH and found a prevalence rate of 59% of the cases. They found a positive association of the changes with blood pressure and severity of disease. This was similar to our study, though the prevalence rate was lower. They did not find any case of haemorrhages, or cotton wool spots or retinal detachments probably reflecting the effective control of hypertension of patients. Also their sample size was smaller.

Karki et al[25] from Nepal have reported 13.7% of fundus changes in their study of 153 subjects with PIH. They as-

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sessed the foetal outcome in these patients and concluded that retinal and optic nerve head changes were associated with low birth weight; choriodal and optic nerve head changes were associated with low APGAR score; and fundus evaluation in patients with PIH is an important procedure to predict adverse foetal outcomes. The prevalence rate found in our study was higher.

Exudative retinal detachment is rare in PIH patients. In our study there was 2 case of eclampsia with serous retinal detachment. It is thought to be caused by choroidal ischemia. Elschnigspots, may also be found in preeclamptic patient with choroidal infarcts. The prognosis in these cases is good, with visual symptoms and changes resolve spontaneously within weeks of delivery. Presence of retinal detachment is a warning sign. The management of serous retinal detachment is the termination of pregnancy after controlling blood pressure and vision can be saved in the affected eye[15,20,21].

Cortical blindness refers to reduced vision from bilateral damage to any portion of the visual pathways posterior to the lateral geniculate nucleus[18,19,21]. Eye examination is typically normal, including a normal pupillary light reflex. It can occur in ante partum and postpartum period, lasting for several hours to several days in preeclampsia and eclampsia patients[12,13]. Other presenting symptoms include headache, seizures and loss of consciousness. MRI shows hypertense signals on T2-weighted images and hypotense signals on T1-weighted images in occipital cortex. These findings are consistent with transient ischemic events as a result of cerebral edema. Management includes magnesium sulphate for seizure prophylaxis, anti-hypertensives for severe hypertension, fluid restriction to avoid worsening of cerebral edema, ophthalmologic and neurologic consultation as well as neuroimaging. Prompt delivery is curative, with resolution of neuroimaging findings[14,17,26].

In conclusion, ophthalmoscopy is a simple tool that can help the obstetrician in assessing the severity of disease in cases of PIH. A change in the retinal vasculature could also reflect a similar disease in the placental microcirculation and predict fetal prognosis. There is significant correlation with the severity of disease and the levels of hypertension.

Most of the fundus changes in PIH are underdiagnosed. Timely ophthalmoscopy should be called for in all cases of PIH as it would affect the decision of induction of delivery, thereby preventing other complications.Visual symptoms are few in patients with PIH and often absent unless the macula is involved. Sudden onset of headache, which is resistant to routine therapy in these patients, may be the warning symptom before the onset of first convulsion. In cases of toxemia of pregnancy, the retinal changes usually regress with decrease in blood pressure and may disappear completely after delivery due to lack of placental toxins. In spite of the increased awareness amongst patients regarding their health and the need for routine examinations and institutional deliveries in pregnancy and an improvement in the management of Pregnancy Induced Hypertension, complications like serous retinal detachment continue to occur, causing ocular morbidity in a physiological state as pregnancy. Therefore, by repeated fundus examinations at regular intervals one can assess the severity of the disease and also response to treatment instituted.

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