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Ophthalomology

A STUDY ON FUNDUS FINDINGS IN PREGNANCY INDUCED HYPERTENSION IN VIJAYAPUR DISTRICT - KARNATAKA.

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ABSTRACT **Background:** Hypertensive disorders in pregnancy are considered the major cause of maternal morbidity and mortality in developing as well as developed countries. It is the most common medical problem in pregnancy, complicating 7–10% of all pregnancies. The biggest limitation clinicians face is differentiating pregnancy induced hypertension from hypertension independent of pregnancy. Pregnancy can affect anywhere in the visual pathway from anterior segment to the visual cortex. Ocular sequelae of 30 – 100% is seen in patients with HELLP syndrome **Method:** A cross-sectional, observational study was conducted on all females admitted with pregnancy induced hypertension in OBG department, Al Ameen Medical College Vijayapur for a duration of 12 months. Patients with pre-existing hypertension, diabetes mellitus and renal disease. Patients with raised blood sugar values. Ocular pathologies like glaucoma, cataract, corneal opacities and history of ocular trauma, surgery or previous laser treatment and having hazy media which hinders the fundus examination were excluded from the study.A total of 100 subjects were included in the study. An interviewer administered a semi-structured questionnaire for data collection.The retinal changes (hypertensive retinopathy) were graded according to Keith Wagner Barker classification. **Results:** 60% were found in the age group of 21 – 25 years. Majority 60% of the cases of PIH was found in primigravida and the rest 40% in multigravida . 67% had a gestational age of>32 weeks at the time of presentation.22% had grade 2, 6% had grade 3 and 2% of the cases had grade 4 hypertensive retinopathy. 44.4% had grade 1 hypertensive retinopathy changes with narrowing of the retinal arterioles. 40.7% had grade 2 changes. **Conclusion:** This study suggested a positive correlation of fundus findings with severity of hypertension.This study conveys the importance of routine fundus examination.

KEYWORDS : Pregnancy , Hypertension , Fundus Examination

INTRODUCTION

Hypertension has become one of the most common medical problems encountered during pregnancy. It is one of the leading cause for maternal and perinatal morbidity and mortality worldwide. It is of global public health concern both in developed and developing countries. However, the risk that women in developing countries die of complications due to hypertensive disorder of pregnancy is approximately 300 times higher than that for women in developed countries.[1] Hypertensive disorders of pregnancy have a wide spectrum of presentation, ranging from mild elevation of blood pressure to severe hypertension with end organ dysfunctions. Among the hypertensive disorders, the preeclampsia syndrome, either alone or superimposed on chronic hypertension, is the most dangerous.[2] Eclampsia is the convulsive form of preeclampsia and affects 0.1% of all the pregnancies.[3] Women who developed preeclampsia were three times more likely to progress to eclampsia and if eclampsia develops, they are 14 times more likely to cause maternal mortality.[4] In the World Health Organization (WHO) systematic review on maternal mortality worldwide, 16 % of maternal deaths were attributed to hypertensive disorders. [5] In eye, severe toxemia is the main cause of diminution of vision. Retinal vessels may take days to develop constriction and last for weeks to months. Progression of retinal changes are similar to ischemic changes in placenta, decides the maternal outcome and fetal mortality rate.[6]

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.[7]

There was a scarcity of data on the occurrence of fundus alterations in PIH . The current study was carried out to determine the prevalence of retinal changes in pregnancy-induced hypertension, as well as the association between the retinal changes and blood pressure and the severity of hypertension.

The aim of this study is to determine the prevalence of retinal changes in pregnancy induced hypertension and to understand the association between retinal changes and severity of hypertension and proteinuria

METHODS

Study Design: A cross sectional, observational study

Study Population: All females admitted with pregnancy induced hypertension in OBG department , Al Ameen Medical College Vijayapur l from Jan2023 – Dec2023 were included in this study..

Study Period: Jan2023 – Dec2023.

Inclusion Criteria

All Pregnant females between age group 18-40 years with new onset of hypertension 28th week of gestation with proteinuria admitted in the OBG department and the referred case with PIH during OPD visit at Al Ameen Medical College Vijayapur.

Exclusion Criteria

Patients with pre-existing hypertension, diabetes mellitus and renal disease. Patients with raised blood sugar values. Ocular pathologies like glaucoma, cataract, corneal opacities and history of ocular trauma, surgery or previous laser treatment and having hazy media which hinders the fundus examination were excluded from the study

Sample Size

A total of 100 subjects were included in the study.

Ethics Approval

The study was approved by the Institutional Ethics Committee (IEC) of Al-Ameen Medical College, Vijayapur district.

Data Collection Instrument

An interviewer administered a semi structured questionnaire for data collection.

The Questionnaire had Four Parts as Following:

Part 1: This part deals with socio demographic factors. This includes age, sex, education, marital status, occupation, source of income, Family arrangement etc

Part 2: This part deals with current pregnancy , age of gestation , records of the vitals, previous history of any other factors that me

comes under the exclusion criteria .

Part 3: Visual acuity examination using Snellen chart and for patients who could not be shifted, bedside vision was taken. Slitlamp examination of the anterior segment was done, wherever possible. Pupils were dilated using tropicamide eyedrops and fundus evaluation was done using indirect ophthalmoscope. Fundus picture was taken, wherever possible. Systemic examination was done to rule out other co-morbidities. Blood pressure was recorded for all the patients. Routine urine analysis for the presence of protein and sugar was done. Protein was analysed using urine dipstick method. Biochemical investigations including blood urea, serum creatinine, serum uric acid and total proteins were done and recorded. Patients were followed up after delivery and reassessed for persistence of fundus changes.

Part 4: The retinal changes (hypertensive retinopathy) were graded according to Keith Wagner Barker classification .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). [8]

Stastical Analysis

The data collected and analysed using SPSS software version 26. Chi Square test was used to compare the retinal changes, severity of hypertension and proteinuria. A P value of less than 0.05 was considered as statistically significant.

RESULTS

Table no 1 shows that maximum number of PIH cases were found in the age group of 21 – 25 years.

Table 2 reveals that majority 60% of the cases of PIH was found in primigravida and the rest 40% in multigravida .

Maximum number of PIH patients(67%) had gestational age>32 weeks at the time of presentation. 23 patients had gestational age of 29-32 weeks, 7 patients between 25-28 weeks and only 3 patients <25 weeks as per the table no 3.

Table no 4 shows that 54 patients fell in the category of mild preeclampsia, 40 in the group of severe preeclampsia whereas 6 patients had hypertension with seizures.

Graph no-1 shows that out of the 100 PIH patients studied, 41 patients had normal fundus findings and the rest 59 patients had some abnormal findings in their fundus.

Table no-5 show that maximum number of patients had either normal fundus (41%) or grade 1 hypertensive retinopathy (24%). 22% had grade 2, 6% had grade 3 and 2% of the cases had grade 4 hypertensive retinopathy. Whereas another 2 % had macular edema. 3% of the cases studied showed central serous retina. 54% of the cases studied had hypertensive retinopathy. This makes hypertensive retinopathy as the most frequently noted sign in PIH.

Table no- 6 showed that a total of 54 patients had hypertensive retinopathy. Of all the PIH patients with hypertensive retinopathy changes, 44.4% had grade 1 hypertensive retinopathy changes with narrowing of the retinal arterioles. 40.7% had grade 2 changes, 11.1% had grade 3 and the rest 3.7% had grade 4 changes. This study shows that maximum number of patients with hypertensive retinopathy had grade 1 and 2 changes.

Table no- 7 shows that association between parity and fundus observation and P value from Fisher's exact test was 0.565. PIH was found more in primigravidas in comparison to multigravidas. But the fundus findings had no correlation with parity. The difference between both was found to be statistically insignificant.

Table no 8 revealed that the fundus changes found in all the 100 cases was correlated with the severity of hypertension and Fisher's exact test was done on the same. P value for the test was found to be <0.001, showing that the two variables have a strong association. That means, as the severity of hypertension increases, there is more chance of the patient having abnormal fundus finding

DISCUSSION

Our study showed that 61% of PIH cases were found in the age group of 21 – 25 years. A study done BY Ramya M showed that 41.5% belongs to 26-28 years of age.[9] Similar finding were seen in a study done by Nalini et al [10] revealed that most of PIH cases (66%) were found in the age group of 21–25 years with mean age=24.32 years.

Majority 60% of the cases of PIH was found in primigravida and the rest 40% in multigravida . Similar finding were seen in study dine by Manpreet et al [11] showing 64.42% were primigravidae, and 35.55% were multigravidae. 70% were primigravidae and 30% were multigravidae seen in astudy done by Bharathi et al [12].

67% had gestational age>32 weeks at the time of presentation. 23 %patients had gestational age of 29-32 weeks. The gestation period ranged from 25 weeks to 40 weeks and 34 (43.5%) were primi gravida.[13]

Our study showed that 54% were fell in the category of mild preeclampsia, 40% in the group of severe preeclampsia whereas 6 %patients had hypertension with seizures. Most patients had mild preeclampsia (54%), followed by severe preeclampsia (40%), and a few had eclampsia with seizures in a study done by Suresh et al [14] . Contrast finding seen in a study by Rahul et al [15] showing out 300 cases of PIH, there are 182 cases of mild preeclampsia and 76 cases of severe preeclampsia and 42 cases of eclampsia.

41% patients had normal fundus findings and the rest 59% patients had some abnormal findings in their fundus.Similar finding seen in M Uma et al [16] Ocular changes were seen in 57% of the PIH patients. 37.1% had normal fundus, and 62.9% cases had abnormal fundus [17]

Our study show that 41% patients had either normal fundus and 24% had grade 1 hypertensive retinopathy . Whereas another 2 % had macular edema. 3% of the cases studied showed central serous retina. 54% of the cases studied had hypertensive retinopathy. In our study 24% showed grade1 hypertensive retinopathy where as in a study by Atakapuram K K and Ram Das showed grade 1 hypertensive retinopathy was seen in 13.53%, which is similar to a study conducted by Kumarra Nandha V et al (13%).[18,19] Grade 1 hypertensive retinopathy was the most common manifestation in PIH patients (51.16%).16 the retinal changes (hypertensive retinopathy changes) were noted in 181 (42.7%) patients [20]

Our study showed that 44.4% had grade 1 hypertensive retinopathy changes with narrowing of the retinal arterioles. 40.7% had grade 2 changes, 11.1% had grade 3 and the rest 3.7% had grade 4 changes. In a study done by Sudha et al 20 shows that grade 1 retinal changes were seen in 33(47.14%) and grade 2 in 4 (6.15%) patients. In S.C. Reddy et al 21 study, grade I retinal changes in 41(52.46%) and grade II in 5(6.4%) were noted. In A.P. Shah 22 study Grade 1 retinal changes in 12 (8%) and Grade 2 in 6 (4%) were noted. S.C. Reddy et al, A.P. Shah studies did not find any haemorrhages, cotton wool spots and/or retinal detachments. [21,22]

In Ranjan et al[23], study demonstrated the prevalence of fundus changes in 70% cases with grade I hypertensive retinopathy, 20% cases have grade II hypertensive retinopathy and 10% cases have Grade III hypertensive retinopathy. Whereas, in Tadin et al. Study reported 10 cases (25%) have grade I hypertensive retinopathy, 6 (15%) cases have grade 2 hypertensive retinopathy and 2 cases (5%) have grade 3 hypertensive retinopathy. [24]

The fundus findings had no correlation with parity. The difference between both was found to be statistically insignificant.Reddy from India has reported retinal changes in 53.4% preeclampsia and in 71.2% in eclampsia patients which is significantly less than of our study y .[25] Another study by Dasgupta S & Ray P, B shows the incidence of retinopathy in PIH is 49%.[26]

The severity of hypertension increases, there is more chance of the patient having abnormal fundus finding. The two variables have a strong association.There is a significant correlation between parity of pregnancy and fundus changes with p=0.0000005, in study conducted by Akanksha et al [27] . The correlation of age with retinopathy is not significant with a p value = 0.16 the correlation with the severity of hypertension and fundus changes is significant with p<0.0000001.[28] A significant association was observed between severity of hypertension and abnormal fundus findings (p<0.01).[29]

CONCLUSION

54 patients had hypertensive retinopathy. 44.4% had grade 1 hypertensive retinopathy changes with narrowing of the retinal arterioles. 40.7% had grade 2 changes, 11.1% had grade 3 and the rest 3.7% had grade 4 changesThis study suggested a positive correlation of fundus findings with severity of hypertension.This study conveys the importance of routine fundus examination .In present study, hypertensive retinopathy changes prevalence was 67% and it is more common in age group 20-25 years and in primigravida

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Declarations
Funding: No Funding
Conflict of Interest: None
Ethical Approval: Yes , Institutional Ethical Clearance was obtained .

Table 1 : Age Wise Distribution Of PIH

Age group (years)	N	%
≥20 yrs	11	11.0
21 - 25 yrs	60	60.0
26 - 30 yrs	21	21.0
31 - 35 yrs	6	6.0
>35 yrs	2	2.0
Total	100	100.0

Table 2 : Parity Wise Distribution Of PIH

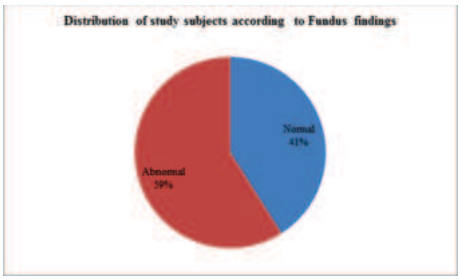
Gravida	N	%
Primigravida	62	62.0
Multigravida	38	38.0
Total	100	100.0

Table 3 : Distribution Of Study Subjects Based On Gestational Age

Period of gestation (weeks)	Number of patients	Percentage
20-24	3	3
25-28	7	7
29-32	23	23
>32	67	67

Table 4 : Distribution Of Study Subjects According To Severity Of Hypertension

Severity of Hypertension	Number of patients
Mild preeclampsia	54
Severe preeclampsia	40
Eclampsia	06



Graph No-1 Distribution Of Study Subjects According To Fundus Findings

Table 5 : Distribution Of Study Subjects According To Observed Fundus Changes

Fundus finding	N	%
Normal	41	41.0
Hypertensive retinopathy	54	54.0
Central serous retinopathy	3	3.0
Macular edema	2	2.0
Total	100	100.0

Table 6 : Distribution Of Study Subjects According To The Grades Of Retinopathy

GRADES OF RETINOPATHY	N	%
GRADE 1	24	44.4
GRADE2	22	40.7
GRADE 3	6	11.1
GRADE 4	2	3.7
TOTAL	54	100.0

Table 7: Association Between Parity And Fundus Changes

Fundus finding	Gravida					
	Primigravida		Multi gravida		Total	
	N	%	N	%	N	%
Gr 1 HTN Retinopathy	14	22.6	10	26.3	24	24.0
Normal	23	37.1	18	47.4	41	41.0
Gr 2 HTN Retinopathy	16	25.8	6	15.8	22	22.0
Gr 3 HTN Retinopathy	3	4.8	3	7.9	6	6.0
Gr 4 HTN Retinopathy	2	3.2	0	.0	2	2.0
Central serous retinopathy	3	4.8	0	.0	3	3.0
Macular edema	1	1.6	1	2.6	2	2.0
Total	62	100.0	38	100.0	100	100.0
	Fisher's Exact Test		P- value = 0.565			

Table 8 : Correlating Fundus Findings With Severity Of Hypertension

Fundus finding	type of PIH							
	Mild HTN (DBP <100)		Severe HTN (DBP >=100)		Eclampsia		Total	
	N	%	N	%	N	%	N	%
Normal	30	55.6	11	27.5	0	.0	41	41.0
Gr 1 HTN Retinopathy	15	27.8	7	17.5	2	33.3	24	24.0
Gr 2 HTN Retinopathy	9	16.7	13	32.5	0	.0	22	22.0
Gr 3 HTN Retinopathy	0	.0	6	15.0	0	.0	6	6.0
Gr 4 HTN Retinopathy	0	.0	0	.0	2	33.3	2	2.0
Central serous retinopathy	0	.0	2	5.0	1	16.7	3	3.0
Macular edema	0	.0	1	2.5	1	16.7	2	2.0
Total	54	100.0	40	100.0	6	100.0	100	100.0
Fisher's Exact Test				<0.001				

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