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Original Research Paper

Ophthalmology

VARIOUS OCULAR FUNDUS CHANGES IN PATIENTS WITH SYSTEMIC HYPERTENSION

Dr.V.Anu Resident In Ophthalmology, Govt. Stanley Medical College, Chennai-1.

Dr. P. Nanthini Resident In Ophthalmology, Govt. Stanley Medical College, Chennai-1.

Proff. Dr. Thangerani Raajaseharan* M.S, D.O, Professor And HOD, Ophthalmology, Govt Stanley Medical College. *Corresponding Author

ABSTRACT

BACKGROUND: The aim of the study was to detect the various fundus changes in hypertensive patients

PATIENTS AND METHODS: 100 patients were studied. All patients with systemic hypertension between the ages of 20 to 60 years are included in the study and are subjected for systolic and diastolic blood pressure measurement followed by baseline anterior segment examination and dilated fundus examination.

RESULT: 61% patients had normal fundus. Hypertensive retinopathy of varying grades was present in 27% patients. Following hypertensive retinopathy, retinal vascular occlusions were next commonly observed manifestation in 10% patients. AION was observed in 1 % of patient and hypertensive choroidopathy in 1% of the patient.

CONCLUSION: Hypertensive retinopathy is the most common fundus change in hypertensive patients followed by retinal venous occlusive disease. An interdisciplinary approach between an ophthalmologist and general physician will help in reducing the complications and thereby reducing the visual morbidity.

KEYWORDS : Ophthalmology, hypertension, hypertensive retinopathy, fundus.

AIM

To assess various fundus changes in patients with systemic hypertension by fundus examination

MATERIALS AND METHODS:

All patients with systemic hypertension of age group 20 to 60 years without any other systemic vascular diseases are included in the study. All the subjects included in the study are subjected for systolic and diastolic blood pressure measurement followed by baseline anterior segment examination and dilated fundus examination with direct ophthalmoscope. All the fundus findings are confirmed with indirect ophthalmoscope and 90D with slit lamp bio microscope examination

INTRODUCTION

Systemic hypertension is one among the foremost risk factor accelerating the progression of various systemic diseases like cardiovascular, cerebrovascular and renal diseases thereby increasing the morbidity and mortality. Patients with hypertensive retinopathy must be under regular follow up since they are at a higher risk of coronary artery diseases. Grade 3 and 4 hypertensive retinopathy is associated with higher risk of mortality

POSTERIOR SEGMENT MANIFESTATIONS OF SYSTEMIC HYPERTENSION

- Hypertensive retinopathy
- Hypertensive choroidopathy
- Retinal artery occlusions
- Retinal vein occlusions
- Ischemic optic neuropathy

HYPERTENSIVE RETINOPATHY

Arterial narrowing is the marker of hypertensive retinopathy which is more commonly seen in chronic hypertension(1). It is also associated with arteriosclerotic changes resulting in progressive thickening of the arteriole due to increase in the elastic and muscular components. The atherosclerotic changes leads to lipid deposition associated with calcification and fibrosis predisposes to thrombosis of the lumen

Grading of hypertensive retinopathy

Keith–Wagener–Barker classification

Group I: minimal constriction of the retinal arterioles with some tortuosity

Group II: more definite focal narrowing and arteriovenous nicking in patients

Group III: abnormalities include those of groups I and II and also haemorrhages and exudates and vasospastic changes, including focal arteriolar constriction and cotton wool spots. May be associated with cardiovascular, renal and cerebrovascular diseases.

Group IV: the abnormalities listed above are present and are usually more severe, and there is optic disc oedema. Elschnig's spots are present in some. The cardiovascular, renal and cerebrovascular diseases are more severe

RETINAL VEIN OCCLUSION

The most important factor that predisposes to venous obstruction in hypertension is atherosclerosis and arteriovenous crossing abnormalities. In RVO, the artery and vein share the same adventitia in the optic nerve where the arteriosclerotic artery compresses the vein which leads to thrombus formation in the vein. The fundus findings in retinal vein occlusion are Dilatation and tortuosity of the veins , flame-shaped and dot/blot haemorrhages corresponding to the retinal area drained by the occluded vein . Other changes include Cotton-wool spots and retinal oedema may be present. The superotemporal quadrant is most commonly affected. The site of occlusion may be identifiable as an arteriovenous crossing point. The various types of retinal vein occlusion are CRVO, BRVO and CRAO

Non Arteritic Anterior Ischaemic Optic Neuropathy

Diffuse or sectoral hyperaemic disc swelling, often associated with a few peripapillary splinter haemorrhages. NAION occurs due to circulatory insufficiency to optic nerve head. The blood flow through the SPCA is decreased in patients with Non arteritis AION. The delay in choroidal filling on FFA suggests that the impaired perfusion arises in the paraoptic tributaries of the SPCA's, distal to their split from the choroidal branches(2).The ischemia may result from hypertension induced arteriosclerosis which may lead to thrombosis and embolization. Persistent ischemia is due to loss of auto regulatory mechanism which may be attributed to arteriosclerosis, beta blockers and other anti-hypertensive drugs

Retinal Artery Occlusions

Hypertensive arterial necrosis is associated with CRAO and

BRAO. Retinal artery occlusion is a devastating condition producing profound visual loss. Atherosclerotic plaque formation due to systemic hypertension may lead to embolus formation and retinal artery occlusion. RAO occurs due to platelet fibrin thrombi and emboli as a result of atherosclerotic disease following uncontrolled hypertension.(3). The Fundus features in CRAO are Cherry red spot and Retinal oedema whereas BRAO are Cattle tracking'/'box-car 'appearance, cloudy white oedematous (ground glass) retina corresponding to the area of ischemia, occluding emboli may be seen at bifurcation points. The affected artery is likely to remain attenuated

HYPERTENSIVE CHOROIDOPATHY

Choroidal lesions secondary to elevated blood pressure are due to choroidal ischemia and its effects on the retinal pigment epithelium and retina. Systemic hypertension leads to loss of auto regulatory mechanism which in turn causes platelet fibrin obstruction resulting in obstruction of choroidal arteries and choriocapillaries. This in turn leads to necrosis of retinal pigment epithelium and fibrinous exudation. (4). The fundus findings are Elschnig's spots which are Patches of retinal pigment epithelium overlying occluded choriocapillaries appear yellow and Siegrist's streaks which are hyperpigmentation with linear configuration that develop over choroidal arteries in chronic hypertension

RESULTS

100 patients were studied. 61% of patients had normal fundus. Hypertensive retinopathy of varying grades was present in 27% of patients. Following hypertensive retinopathy, retinal vascular occlusions were next commonly observed manifestation in 10% of patients. AION was observed in 1% of patient and hypertensive choroidopathy in 1% of patient.

Out of 39 patients who had hypertensive related fundus changes, 19 were male and 20 were female. So there was no significant gender preponderance .Among the patients with hypertensive retinopathy changes of varying grades, Grade 1 was present in 12 patient grades 2 in 9 patients grade 3 in 4 patients and grade 4 in 2 patients.

Retinal vascular occlusions were found in 10 patients of whom 3 % had CRVO, 5 patients had BRVO AND 2 % had CRAO. All 10 patients had hyperlipidaemia which shows a significant association between systemic hypertension and hyperlipidaemia in pathogenesis of retinal vascular disorders.

Among the 100 study subjects, 39 subjects had hypertensive retinopathy and associated fundus complications. Table 1 shows an association between the duration of hypertension and the occurence of hypertension related fundus change.

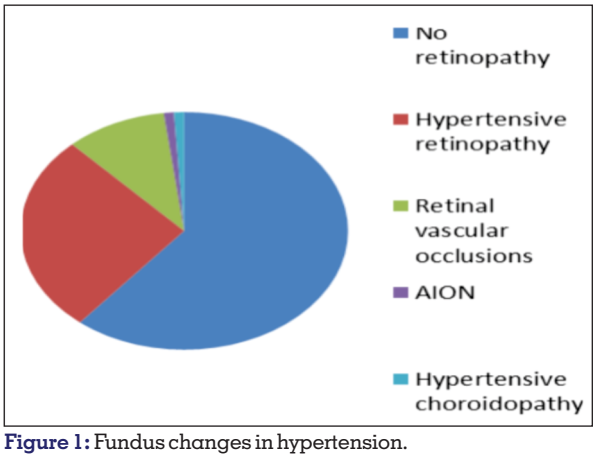

Figure 1: Fundus changes in hypertension.

Table 1: Duration of hypertension and retinopathy

Duration	No retinopathy	Hypertensive related changes	Total
< 5 years	23	2	25
5 – 10 years	14	10	24
11 – 15 years	20	9	29
>15 years	4	18	22
Total	61	39	100

DISCUSSION:

The study revealed a significant level of hypertensive retinopathy and venous occlusive diseases in hypertension patients. The duration of hypertension was found to be significantly associated with development of hypertensive retinopathy. Increase in the duration of hypertension was associated with increased occurrence of hypertensive fundus changes. Oluleye et al study showed that the hypertensive retinopathy was present in 19.4 %of the patients where as it is 27% in our study. Retinal vascular occlusion was present in 13.4% whereas it is 10% in our study and AION and hypertensive choroidopathy was 0.6 and 0.8 % respectively in their study whereas it 1% in our study .

Retinal artery occlusion is a harmful condition leading to profound visual loss and is an emergent ocular vascular occlusive disorder that frequently leads to profound loss of vision, and also these patients are at increased risk of a cerebrovascular accident. Embolism originating from carotid is the most common cause of RAO. Both patients had sudden painless diminution of vision and RAPD with visual acuity of hand movements at presentation. Both the patients had retinal oedema, box-carring, retinal artery attenuation and cherry red spot which are the common features of RAO. Both the patients were diagnosed with ipsilateral carotid artery plaque Retinal venous occlusions are a devastating cause of visual loss. Visual acuity is reduced due to macular oedema and retinal ischemia. Out of 8 patients who had retinal venous occlusions, 5 were smokers which revealed smoking to be a significant precipitating factor.

Hypertensive choroidopathy is observed more commonly in younger individuals with acute rise in blood pressure. Accelerated hypertension may result in choroidal ischemia which leads to changes in hypertensive choroidopathy.

CONCLUSION:

Hypertensive retinopathy is the most common fundus change in hypertensive patients followed by retinal venous occlusive disease. The presentation of Retinal artery occlusion is emerging as an alarm of an incoming stroke alerting physicians to start actions to manage these patients with thorough evaluations and treatments to prevent further deterioration. An interdisciplinary approach between an ophthalmologist and general physician will help in reducing the complications and thereby reducing the visual morbidity.

REFERENCES:

1. RYAN'S RETINA 6th Ed 3 Volumes Set.pdf.
2. Miller NR, Arnold AC. Current concepts in the diagnosis, pathogenesis and management of nonarteritic anterior ischaemic optic neuropathy. Eye. 2015 Jan;29(1):65–79.
3. Varma DD, Cugati S, Lee AW, Chen CS. A review of central retinal artery occlusion: clinical presentation and management. Eye. 2013 Jun;27(6):688–97.
4. Bourke, K., Patel, M.R., Prisant, L.M. and Marcus, D.M. (2004), Hypertensive Choroidopathy. The Journal of Clinical Hypertension, 6: 471-472. https://doi.org/10.1111/j.1524-6175.2004.3749.x.
5. Oluleye T, Olusanya B, Adeoye M. Retinal vascular changes in hypertensive patients in Ibadan, Sub-Saharan Africa. IJGM. 2016 Aug;Volume 9:285–90.