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Hypertensive retinopathy in chronic hypertensive patients: a cross sectional study from Peshawar

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ABSTRACT

Background: Hypertension is one of the most prevalent health conditions around the globe. Long standing hypertension affects major organs like brain, kidneys and eyes. Persistent raised blood pressure may result in complications like stroke, coronary artery disease, renal damage, damage to retina, etc. Blood vessels of the retina are damaged in hypertensive retinopathy which not only threatens vision but is also an independent risk factor for cardiovascular and cerebrovascular disease.

Objectives: To determine the magnitude of hypertensive retinopathy and its risk factors in chronic hypertensive patients attending a tertiary care hospital of Peshawar.

Material and Methods: A cross sectional study was conducted on a total of 110 hypertensive patients of Peshawar at Ophthalmology unit of Naseer Teaching Hospital, Peshawar from December 01, 2018, to May 30, 2019. Diagnosed hypertensive patients of more than 5 years duration were included in the study through convenience purposive sampling technique. After obtaining informed written consent, the data were collected using a self-administered, closed ended questionnaire followed by detailed ophthalmological examination for diagnosis of hypertensive retinopathy and subsequently analyzed for descriptive statistics using SPSS version 20.

Results: Out of the total 110 patients, 68(61.81%) were females while 42(38.18%) were males. Mean age of the patients was 53.80 ± 8 years; 31(28.18%) of the patients were found to have retinopathy due to hypertension. Hypertensive retinopathy affected more males (n=21, 30.88%) as compared to females (n=10, 23.80%). Older patients over 45 years of age who had more than 5 years history of hypertension were affected more as compared to younger hypertensive patients.

Conclusion: Retinopathy is present in a sizeable proportion of patients with longstanding hypertension. The identified risk factors included male gender, advancing age (>45years) and longer duration of hypertension (>5 years).

Keywords: Hypertensive Retinopathy; Hypertension; Cardiovascular Disease; Risk Factors; Visual Impairment.

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INTRODUCTION

Hypertension is a chronic medical condition with persistently raised blood pressure in systemic arteries. In general, persistently raised blood pressure over a period of 3 months or more defines chronicity. As per recent WHO statistics, hypertension affects 1 in 3 adults worldwide.[1] To make things worse, nearly half of the people globally are currently unaware of their condition and approximately 4 out of 5 people with hypertension are not adequately treated.[1] Uncontrolled hypertension may present with symptoms of headache, dizziness, fatigue, vertigo and blurred vision, etc.[2,3] Long standing hypertension may result in complications like stroke, coronary artery disease, atrial fibrillation, heart failure, chronic kidney disease, dementia and retinopathy.[4-7]

Blood pressure greater than 180/110mmHg is termed as hypertensive crisis that can be an emergency depending on presence or absence of end organ damage.[8-10]

Hypertensive complications related to eye include choroidopathy, optic neuropathy and retinopathy.[11] Retinopathy i.e. damage to retinal blood vessels is one of the major complications of hypertension.[12]

Hypertensive retinopathy is graded on the basis of duration and severity of the disease. A commonly used grading system is the Wagener Keith Barker (KWB) classification,[12] in which Grade I is a mild disease characterized by arteriolar narrowing, AV nicking and/or arteriolar wall opacity, Grade II retinopathy represents definite focal narrowing and arteriovenous nipping, Grade III is moderate disease severity and includes hemorrhage(s), micro-aneurysm(s), cotton wool spots and/or hard exudates, while the presence of features of moderate retinopathy along with optic disc swelling is graded as severe, Grade IV retinopathy.

Hypertensive retinopathy (HRP) is not only one of the leading causes of visual impairment among adult patients with hypertension but also an independent risk factor for cardiovascular and cerebrovascular disease.[13] Therefore, it is important to study the prevalence and risk factors of retinopathy in hypertensive patients in Pakistan, in order to reduce the incidence of hypertensive retinopathy and associated comorbidities.

MATERIALS & METHODS

A cross-sectional, descriptive study was conducted at Ophthalmology unit of Naseer Teaching Hospital, Peshawar, over a period of six months from December 01, 2018, to May 30, 2019. A total of 110 hypertensive patients including 68 females and 42 males were recruited through Ophthalmology and Medical OPDs via purposive sampling technique. The inclusion criteria included only known cases of chronic hypertension, aged above 40 years, and with a minimum duration of hypertension of over 5 years. Patients with a history of diabetes mellitus, history of previous eye surgeries, and untreated hypertension, were excluded to reduce the impact of confounding variables on the study results.

After approval from the hospital research ethics committee, informed written consent was obtained from all study participants. A predesigned closed-ended questionnaire was used to collect relevant information, followed by detailed ophthalmoscopy by the consultant ophthalmologist to record retinal changes of hypertensive retinopathy. The Wagener Keith Barker (KWB) Classification[12] of hypertensive retinopathy (Table 1) was used to diagnose and categorize patients for the severity of hypertensive retinopathy.

Table 1. The Keith Wagener Barker (KWB) classification system for hypertensive retinopathy

Grade	Features
1	Mild generalized retinal arteriolar narrowing, arteriovenous tortuosity
2	Definite focal narrowing and arteriovenous nipping
3	Signs of grade 2 retinopathy plus retinal hemorrhages, exudates and cotton-wool spots
4	Severe grade 3 retinopathy plus papilledema or retinal edema

After collection of data, analysis was carried out using SPSS version 20 for descriptive statistics. The Chi-square test was applied for categorical variables, with $p \leq 0.05$ considered statistically significant.

RESULTS

The study was conducted on 110 hypertensive patients including 68(61.8%) females and 42(38.18%) males. Mean age of the participants was 53.80 ± 8 years. Of the total, 31(28.18%) patients were found to have retinopathy of different severity (Table. 2).

Table 2: Frequency of different stages of hypertensive retinopathy (n=31).

Stages	Frequency (%)
Stage I	17 (54.83)
Stage II	08 (25.80)
Stage III	05 (16.12)
Stage IV	01 (03.22)
Total	31 (100)

Hypertensive retinopathy affected more males (30.88%) as compared to female patients (23.80%). Out of total 110 hypertensive patients, 79(71.81%) were aged more than 46 years. Among those with hypertensive retinopathy, 26(83.87%) patients were aged 46 years and above (Table 3).

Table 3: Frequency of Hypertensive Retinopathy in different age groups (n=110).

Age Groups (Years)	Screened hypertensive patients (f)	Patients with Retinopathy f (%)
25-35	(06)	01 (16.66)
36-45	(25)	03 (12.0)
46-55	(35)	10 (28.57)
>55	(44)	16 (36.36)
Total	(110)	31(28.18)

Table 4 shows an increasing trend of hypertensive retinopathy in chronic hypertensive patients with the duration of hypertension.

Table 4: Relationship of prevalence of hypertensive retinopathy with duration of hypertension

Duration of Hypertension (years)	Screened hypertensive patients (f)	Hypertensive Retinopathy f (%)
05	(29)	05 (17.24)
5-10	(38)	10 (26.31)
>10	(43)	16 (37.20)
Total	(110)	31 (28.18)

DISCUSSION

In our study, the prevalence of hypertensive retinopathy in hypertensive population was 28.18%. This is comparable with findings of other studies from Iran,[14] Italy,[15] and Bangladesh,[16] that reported a prevalence of 29.4%, 30.6%, respectively. Kolman S, et al[17] however; reported a much higher prevalence of 44% in hypertensive patients of comparable age group from Holland. Such a difference in prevalence could be partly explained by the recruitment method employed in their study. They conducted their research study on hypertensive patients referred by general practitioners to specialized hypertension clinic and therefore, likely involved patients with resistant hypertension or other comorbidities to account for over 44% prevalence of hypertensive retinopathy.

In our study, 54% of the retinopathy patients had grade I disease whereas, 25.80% had grade II disease and only 3.22% had signs of grade IV disease (Table. 2). Mondal et al[16] also reported the same pattern in their study. More patients were suffering from grade I (14.70%) and grade II (8.60%) stage retinopathy whereas less than 1% had grade IV disease.

We found hypertensive retinopathy to be more common in males (30.88%) as compared to females (23.80%). Similar gender distribution was found by Mondal et al[16] who reported a higher prevalence of 66.1% in males as compared to females. This finding of higher prevalence in males is however; in contrast with findings of Besharati et al[14] who reported a significantly higher prevalence of hypertensive retinopathy in females (45.6%) as compared to male (33%). The exact cause remains unknown but could be partly explained by the higher mean age of participants

in the afore-mentioned study (64.47 ± 10.66 years) with probable role of age-related changes as a confounder.

Moreover, a positive correlation was found in the present study between prevalence of hypertensive retinopathy and advancing age and duration of hypertension (Table 4). These findings tally well and undisputedly with the findings of similar studies.[14-18]

CONCLUSION

About one fourth of the hypertensive patients, predominantly males, with mean age more than 45 years are prone to suffer from hypertensive retinopathy and its consequences.

RECOMMENDATIONS

This situation dictates vigilance on the part of healthcare providers to adequately treat hypertension in all patients through appropriate pharmacotherapy and lifestyle interventions to reduce the risk of development of hypertensive retinopathy and its allied consequences.

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