ORIGINAL PROF-764

PREVALENCE OF RETINOPATHY IN HYPERTENSIVE PATIENTS

DR. MUHAMMAD ZAKRIA MBBS
Registrar Medical unit-II
Allied Hospital, Faisalabad.

DR. KHALID AMIN MBBS, FCPS
Assistant Professor of Medicine
Punjab Medical College, Faisalabad.

DR. ISRAR KAFEEL MBBS
Registrar Medical Unit - II
Allied Hospital, Faisalabad..

Dr. Masood Javaid, MBBS, FCPS
Senior Registrar, Medical Unit-I
Allied Hospital, Faisalabad.

Dr. Zafar Alam, MBBS, FCPS
Registrar, Medical Unit-II,
Allied Hospital, Faisalabad.

ABSTRACT... drkamin2002@hotmail.com **Objective:** The objectives of this study were to find out the prevalence of hypertensive retinopathy among hypertensive patients in this area of Pakistan and grading of hypertensive retinopathy at the time of examination according to the Keith-Wagener retinal changes classification for hypertension. **Study Design:** An observational study. **Period:** 5½ months **Setting:** Outdoor/emergency department as well as in medical unit - II of Allied Hospital, Faisalabad **Material & Methods:** Three hundred consecutive patients with hypertension of either sex and between 20-85 years of age were examined. Opthalmoscopy was done after dilating the pupil with 1% Mydriacyl and retinopathy graded according to Keith-Wagener Classification. **Results:** Among these patients, 168 had the finding of hypertensive retinopathy, with overall prevalence of 56%. Out of these 168 patients, 70 had grade I, 75 had grade II, 18 had grade III and 05 had grade IV changes according to the Keith-Wagener Classification of hypertensive retinopathy. Among these 168 patients with hypertensive retinopathy, 64 were males and 104 were females, with overall prevalence in males 58.18% and in females 54.73%. It is found that prevalence of hypertensive retinopathy is maximum in patients with 50 years of age or above. The prevalence of hypertensive retinopathy increases with the duration of hypertension and is maximum in patients with duration of 10 years or more. Two hundred twenty five (225) patients were taking single drug and out of these 110 patients were found to have retinopathy with prevalence of 48.8%, 40 patients were taking combination therapy and out of these 34 patients were found to have retinopathy with prevalence of 86%. The remaining 35 hypertensive patients who had never taken medicine for their B.P control, out of these 35, 22 patients were found to have hypertensive retinopathy with prevalence of 62.8%. **Conclusion:** Prevalence of hypertensive retinopathy in our population is quite high, seen in both sexes and almost in all age groups. It increases with duration of the disease, higher in patient who are taking combination of drug as compared to those who were on single drug.

INTRODUCTION

Elevated arterial pressure is probably the most important public health problem in developed countries and fairly common in developing countries. Although it is common, asymptomatic, readily detectable and easily treatable, yet often leads to lethal complications if left untreated[1]. Most patients with hypertension have no specific symptoms referable to their B.P elevation and are identified only in the course of their routine physical examination. Symptoms of hypertension when present are related to:-

1. Elevated pressure itself.
2. Hypertensive vascular disease.
3. Underlying disease in case of secondary hypertension.

The neurological effects of long standing hypertension may be divided into retinal and central nervous system changes. Because the retina is the only tissue in which the arteries and the arterioles can be examined directly, repeated opthalmoscopic examination provides the opportunity to observe the progress of the vascular effects of hypertension[1,2,3]. Perhaps the best known classification of hypertensive retinopathy is the Keith-Wagener classification. It is as follows:

Grade I	Mild narrowing or sclerosis of retinal arteries.
Grade II	Moderate to marked narrowing or sclerosis with enhanced light reflex and arteriovenous crossing changes.
Grade III	In addition, haemorrhages or cotton-wool spots.
Grade IV	In addition, swelling of optic nerve head (papilloedema) or retina[4].

MATERIALS & METHODS

The study was carried out in the outdoor department as well as in patients admitted in Medical Unit-II, Allied Hospital, Faisalabad.

STUDY DESIGN

"It was observational study". Consecutive 300 patients with hypertension, irrespective of the duration of illness, cause, age, sex and therapy used, attending outdoor/emergency department as well as in the Medical Unit II of Allied Hospital were scored for hypertensive retinopathy. All cases of hypertension were studied in detail using a proforma to record the patient's name, age, sex, address, date of admission, mode of presentation, known duration of hypertension, history of taking anti-hypertensive drugs (single/combination) and whether they were taking regularly or irregularly. They were asked about diabetes to exclude the persons with positive history.

Blood pressure was measured with mercury sphygmomanometer at the time of admission or in the outdoor department at the time of visit. After the patient had been comfortably seated, with an appropriately sized BP cuff on left arm, obliteration of the radial pulse was determined. Brachial artery was located and stethoscope was placed. One minute after, the first and fifth Korot-koff's sound were measured and recorded as systolic and diastolic B.P respectively. A detailed general physical, systemic and particularly cardiovascular examination was carried out. All patients were examined specifically for cardiomegaly and left ventricular hypertrophy.

In this clinical study data related to retinopathy was collected with the help of ophthalmoscope, after dilatation of the pupils with 1% mydriacyl. Hypertensive retinopathy was graded according to the Keith-Wagener and Baker classification[5].

Investigations performed in all patients including complete blood count, erythrocyte sedimentation rate, complete urine examination, blood glucose, blood urea, serum creatinine, serum cholesterol, electrocardiography (ECG) and x-ray chest - PA view. X-ray facilities from the department of Radiology, Allied Hospital Faisalabad were availed. For laboratory investigations, facilities from PMRC, Research Cell (PMC Department of pathology, Laboratory of Allied Hospital and private laboratories) were availed.

Patients Criteria:
Patient selection were done in a meticulous manner for which an inclusion and exclusion criteria was delineated.

Inclusion Criteria:
All the patients with hypertension, irrespective of the duration of illness, cause, age, sex, therapy used, attending outdoor as well as indoor in the Medical Unit II were screened for hypertensive retinopathy.

Exclusion Criteria:
All hypertensive patients along with diabetes mellitus were excluded from the study.

Hypertensive patient criteria:
For hypertensive patients, the following criteria were noted:

a). Patients having definite history of taking anti-hypertensive medications or having authentic previous medical record suggestive of hypertension were regarded as known hypertensive.

b). Patients having no previous checkup and having high BP readings i.e. > 160/90 mm of Hg at the time of examination were considered hypertensive, if clinical examination, ECG, X-ray chest - PA view and echocardiographic findings were consistent with the changes occurring due to hypertension.

I). Clinical examination findings consistent with hypertension
Following findings on clinical examination of CVS were regarded due to hypertension:-

1). Displaced/undisplaced apex beat of sustained character on palpation after ruling out obstructive lesions of the outflow tract by echocardiography.
2). Presence of fourth heart sound (S_4) on auscultation of apical area. Other causes of S_4 were ruled out by history, clinical examination and investigations like ECG and echocardiography.
3). Presence of ejection systolic murmur at aortic area excluding causes of ejection systolic murmur other than hypertension.

II. ECG findings consistent with hypertension
ECG findings of left ventricular hypertrophy, were regarded because of hypertension, provided there was no other cause of left ventricular hypertrophy.

III. Radiological findings regarded to be suggestive of hypertension

- Cardiomegaly due to left ventricular enlargement, excluding other causes of cardiomegaly.
- Unfolding of arch of aorta.

Statistical Analysis
After studying 300 patients, the data was analyzed by using Z test for proportion and Chi-sqaure (x^2) test to check the association between two categories.

RESULTS

This study ranged over a period of 5 ½ months and the patients examined during this period were divided into six age groups i.e. Group I ranges from 21-30 years(19 patients), Group II ranges from 31-40 years (30 patients), Group III ranges from 41-50 years (80 patients), Group IV ranges from 51-60 years (69 patients), Group V ranges from 61-70 years (72 patients) and Group VI ranges from 71 years or above (30 patients). 110 were males and 190 were females and 286 were married whereas 14 were unmarried. The duration of the disease was asked to every patient and had disease duration from 6 months to 18 years. 225 patients were using single drug for hypertension, 40 were using combination of anti-hypertensive drugs for their control of hypertension. Alarmingly, 35 patients had never taken any medicine for their control of hypertension. Out of 265 patients 79 patients were taking their medicine regularly while the remaining 186 patients were not taking their medicine regularly. 86 patients were those who had their blood pressure controlled, while the remaining 214 patients were having their blood pressure uncontrolled, at the time of visit.

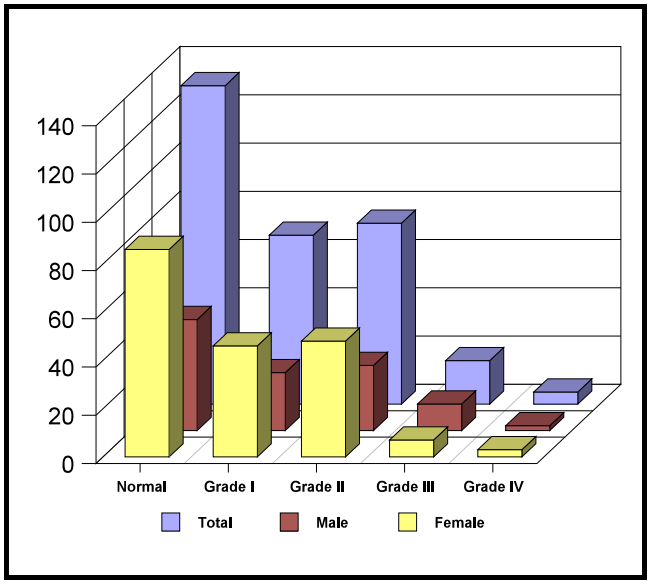
The total no. of 300 patients were under-gone direct ophthalmoscopy looking for the grading of retinopathy according to the Keith-Wagener classification of retinopathy in these patients. Maximum no. of patients were in grade II - 25% (75 cases: 27 males and 48 females). 44% (132) of the patients were normal i.e. normal retina. Other patients were in grade I (70), II (18) and IV (5) at the time of examination.

Distribution of patients according to the grade of retinopathy.

Grade of Retinopathy	No. of hypertensive patients			%age
	Male	Female	Total	
Normal	46	86	132	44%
Hypertensive Retinopathy	64	104	168	56%
Grade I	24	46	70	23.3%
Grade II	27	48	75	25%
Grade III	11	07	18	06%
Grade IV	02	03	05	1.7%

Out of 110 males 64 had retinopathy and out of 190 females 104 had retinopathy. Hypertensive retinopathy are maximum among the patients having duration of hypertension more than 10 years, with 100% (03 cases out of 3 patients) retinopathy seen in group having known duration of hypertension more than 15 years.

The prevalence of retinopathy is more in patients taking combination of anti-hypertensive drugs for their control of BP i.e. 85% (34 cases). The prevalence is high among those patients who are not taking their medicine regularly i.e. 63.4% (118 cases out of 186 patients). 86 patients with controlled BP 22 had retinopathy, while 214 remaining patients with uncontrolled BP 146 had retinopathy.



DISCUSSION

In many developing countries such as Pakistan education about hypertension and its complications is lacking at all levels. This is largely because of the poor appreciation of the problems, lack of expertise, shortage of manpower and absence of literature, equipment facilities for such education.

Hypertension is a risk factor for various forms of cardio-vascular disease. Accelerated hypertension leading to hypertensive retinopathy can produce visual disturbance and can lead to loss of vision[6,7]. So, in hypertensive patients it is important to look carefully at the retina, as the changes will help to decide if treatment is necessary, it if is adequate, or if it is needed urgently. Grading is a useful guide to severity of hypertension and helps in assessing both immediate and longer term changes. It is important to remember that blood pressure high enough to damage renal and cerebral vessels is best organized by looking carefully at the retinal vessels. Because there may be no symptoms even in those patients with more severe retinopathy, as the vision in most patient remain normal[4].

There is no data available on the prevalence or incidence of hypertensive retinopathy both in Pakistan and in developed countries. Only population

based studies have been performed in selected population. The best predictor of hypertension was general and/or focal narrowing of retinal arteries. The later had a particularly high correlation with hypertension[8,9]. Our study also shows a highly significant association (P<0.01) between duration of illness i.e, hypertension and the prevalence of retinopathy. It also shows prevalence of hypertensive retinopathy more in men than in women.

In a study conducted on inhabitant of Sweden, Caucasian population with essential hypertension, the prevalence of hypertensive retinopathy was observed in 54.83%[10]. In our study, the overall prevalence of retinopathy in hypertensive patients is 56%, which is very much comparable with this study.

A retrospective study of malignant hypertension in a district hospital, Birmingham, 200 patients with malignant and accelerated hypertension admitted in hospital were investigated. 95 patients had grade IV retinopathy (47.5%), 31 had grade III retinopathy (15.5%) and 72 patients had failed to meet the criteria for the retinopathy[11]. In our study, prevalence of retinopathy according to grading is more in with grade II changes (25%). Grade III and grade IV showing prevalence of retinopathy 6% and 1.7% respectively. This wide difference is due to our study irrespective of the severity of hypertension, while above mentioned study was done in people with accelerated or malignant hypertension.

The only population based study to investigate the relationship of various retinal lesions to systemic hypertension was done by Ronald Kelin, Barbara E.K, Klein et al in people live in Beaver Dam. In that study out of 4926 persons examined, 1479 were hypertensive. Retinopathy was present in 336 subjects (prevalence of 7.8% in that population 22.7% in hypertensive patients) i.e. having flame shaped retinal hemorrhages, cotton wool exudates, according to Modified Airlie House Classification Scheme. Overall prevalence of retinopathy in hypertensive patients in this study was 68.5%[12]. Prevalence of retinopathy is 56% in our study also near to the above mentioned study. In our study, prevalence of retinopathy is more in males 58.18% (64 out of 110) than females 54.73% (104 out of 190) and also in un-controlled hypertensive patient i.e. 68.22%, also supporting the study. Five years later people were again examined in Beaver Dam. Among them, 2151 (69.1%) were normotensive and 963 (30.9%) were hypertensive. Retinopathy was developed in 658 patients with prevalence of 68.3% in hypertensives[13].

In our study prevalence of hypertensive retinopathy increases with age and duration of disease. The prevalence was maximum in duration of 10 years or above and age group 40-70 years. These are also comparable with the Blue Mountain Eye Study[14] showed that retinal lesions are relatively frequent in older people without diabetes and significantly related to the pressure and severity of hypertension. Male dominance and higher prevalence in uncontrolled BP patients also supported by Blue Mountain Eye Study.

We also observed that the patients who were taking there medicine regularly had retinopathy with the prevalence of 32.9% (26 cases out of 79) and the patients who were careless about the control of BP and taking there medicine irregularly have prevalence of 63.4% (118 cases out of 186).

CONCLUSION

Following conclusions can be drawn from this study:

- The prevalence of retinopathy in our population is quite high.
- Prevalence of hypertensive retinopathy increases with the duration of the disease.
- Hypertensive retinopathy is seen in both sexes and almost all age groups.
- Males are affected more than females.
- Prevalence of hypertensive retinopathy is higher in uncontrolled BP patients as compared to controlled BP patients.
- Prevalence of hypertensive retinopathy is higher in patients taking their drug irregularly as compared to those who are taking their drug regularly.

REFERENCES

1. Goroon H Williams. **Hypertensive vascular disease.** Harrisons Principles of internal Medicine 15th edition, 2001: 246: 1414-1430.

2. Martin MB. **Cerebrovascular diseases, epidemiology, history, examination and different diagnosis.** Medicine International, 1996: 34(10):34-41.

3. Chen Yh, Kuo Hk, Kao ML. **Malignant hypertensive retinopathy-clinical and fundus manifestations in patients with new onset or acute exacerbation of chronic hypertension.** Chang Gung Med J. 2003 Sep; 26(9): 669-77.

4. P. Frith: The eye in general medicine. **Oxford Textbook of Medicine** (3rd Edition) 1996: 26; 4179-4199.

5. Stephen J. H. Millar: **Parsons Disease of the eye.** 18th edition reprinted 1996. 22; 229-251.

6. Johanna M. Seddon. **Hypertension. Principles and practice of opthalmology,** 1994 Vol 4; 232: 2868-73.

7. Zou H, Zhang X, Xu X, Wang W et al. **An epidemiological survey of low vision and blindness of senile persons in Beixinjing blocks,** Shanghai. Zhonghua Yan KeZa Zhi. 2002 Dec; 38(12): 744-6.

8. Wong et al. **Narrowed retinal arterioles predict development of hypertension.** BMJ 2004; 329:7457.

9. Svardsudd IC, Wedel H, Aurell E et al. **Hypertensive eye groung changes peruder studies to BP and progrotia inputange.** Acta Med Scand 1978; 204: 159-67.

10. Cerasola G. Cottone S. Mule G et al. **Microalbuminuria, renal dysfunction and cardiovascular complication in essential hypertension.** J. Hypertens 1996 Jul; 14(7): 915-20.

11. Ahmad MEK, Welker Jcl, Beever DG et al. **Lack of difference between malignant and accelerated hypertension.** BMJ 1986; 292: 235-237.

12. Ronald Klein MD, Barbara EK, Klein et al. **Hypertension and retinopathy, Arteriolar narrowing, and Arteriovenous nicking in a population.** Arch Opthalmol. 1994 Jan; 12:92-98.

13. Klein R, Klein BEK, Moss SE. **The relation of systemic hypertension to changes in retinal vasculature: The Beevar Dam Eye Study.** Trans Am Opthalmol Soc. 1997; 95: 329-48.

14. Yu-T; Mitchell P; Berry G, et al. **Retinopathy in older persons without diabetes and its relationship to hypertension.** Arch Opthalmol. 1998 Jan; 116(1):83-9.