Original Article

Vision Problems in Hypertensive Patients

Relationship Between Duration of Hypertension and Vision Problems in Hypertensive Patients: A Cross-Sectional Survey

Muhammad Luqman Ali Bahoo[1], Muhammad Sarwar Khalid[2] and Mazhar ul Haq[1]

ABSTRACT

Objective: To study the relationship between duration of hypertension and vision problems in individuals suffering from hypertension.

Study Design: Cross-sectional study.

Place and Duration of Study: This study was conducted at the Medical Outpatient Department of Medicine, Shahida Islam Medical College and Hospital, Lodhran from April 2018 to September 2018.

Materials and Methods: A cross-sectional survey was conducted on 307 patients of 18 or higher ages hospital with the utilization of convenient sampling technique Age, duration of hypertension and presence and type of vision problem in patients were evaluated with the help of a structured questionnaire developed specifically for the study. For inferential analysis chi-square test was employed. Potential confounding effect of age was controlled by means of stratification.

Results: The outcome of the study predicted a significant positive association between longer duration of hypertension and presence of vision problems (p=0.004) where patients with longer duration of hypertension had higher prevalence of vision problems than those with shorter duration (66.7% vs. 48.1%) although after controlling for the potential confounding effect of age, this association no longer persisted in any of the two age groups (p>0.05 for both).

Conclusion: The study results revealed a positive association between longer duration of hypertension and presence of vision problems, although not after controlling for the confounding effect of age. Moreover, no significant association between duration of hypertension and types of vision problems was observed in the study participants. Further evaluation of the study findings with more rigorous study designs and a larger sample size is recommended.

Key Words: Vision Problems, hypertensive patients, duration of hypertension, age.

Citation of articles: Bahoo MLA, Khalid MS, Haq M. Relationship Between Duration of Hypertension and Vision Problems in Hypertensive Patients: A Cross-Sectional Survey. Med Forum 2019;30(2):103-107.

INTRODUCTION

The precise definition of Hypertension is, 'systolic blood pressure of ≥140 mm Hg, or a diastolic blood pressure of ≥90 mm Hg, or taking anti-hypertensive medication'.[1] It has been recognized as the third most cause for morbidity resulting in 64 million inability settled living years (4.4% in overall DALYs) and as the predominant element of danger for death worldwide.[2] In 2005, global hypertension prevalence was estimated to be 26% which by the year 2025 is expected to rise to 29%.[3] The percentage of the people suffering from high blood pressure worldwide decreased during the years 1980 and 2008. Nevertheless, due to the expansion of population and ageing, the amount of individuals with uncontrolled hypertension amplified from 600 million in 1980 to about 1 billion in 2008. Moreover, hypertension is estimated to result in 7.5 million mortality rate annually, around 12.8% of all deaths.[4] The highest prevalence of hypertension globally has deviated from upper average revenue countries to lower average revenue countries.[5] It is estimated that by 2025 approximately three fourths of individuals with hypertension will be living in evolving countries.[3] World Health Organization estimates the total prevalence rate of hypertension in Pakistan to be 25.2%.[6] Raised blood pressure levels have consistently been revealed to be related to the hazard for stroke and coronary heart disease. Additionally, the complications of hypertension include peripheral vascular disease, kidney disease, retinal hemorrhage and visual disturbances.[4]

Visual impairment is reported to have a remarkable effect on quality of life and it has been estimated that the quality of life related to health is substantially deduced in persons who are suffering from visual impairment in comparison with normal individuals.[7] Visual impairment has also been found to contribute to deficits in performance on everyday tasks.[8] It therefore

[1.] Department of Ophthalmology, SIMC Lodhran.
[2.] Department of Cardiology, QAMC, Bahawalpur.

Correspondence: Muhammad Luqman Ali Bahoo, Assistant Professor of Ophthalmology, SIMC, Lodhran.
Contact No: 0333-6363991
Email: rluqmanali@yahoo.com

Received: August, 2018
Accepted: November, 2018
Printed: February, 2019

results in a lifelong disparity as patients with visual damage usually have worse physical condition, and encounter obstacles to education and work. The effects of blindness are too visible in a family as helpful responsibilities can lessen the chances of other family members to flourish and amplify the possibility of misery of the family. The effect is well-versed nationally as well, where blindness can result in financial deficits and augmented costs to the health sector.[9]

World Health Organization estimates that 39 million individuals are suffering from blindness and 253 million to have vision disturbances globally.[9] Pakistan National Blindness and Visual Impairment Survey report the prevalence of vision loss to be 2.7%, with an estimated 1.14 million blind adults in Pakistan.[10] It has been estimated that the preventable causes of visual impairments are upto 80% of the entire universal load.[11] Likewise, the estimated percentage of preventable causes of visual impairment in Pakistan is placed at 85.5%.[12]

Literature frequently relates tighter blood pressure control with favorable visual outcomes in hypertensive patients. Browning AC et al. in 2001 suggested that the chances of permanent severe visual damage can be reduced by promptly diagnosing the malignant hypertension in children.[13] Colucciello M in 2005 concluded that modification of risk factors such as hypertension can enhance vision outcomes and protect the standard of living.[14] Bhargava M et al. in 2012 reported that high blood pressure typically leads to a sequence of microvascular retinal alterations known as hypertensive retinopathy, consisting of retinal arteriolar constriction, arteriovenous nicking, retinal hemorrhages, micro aneurysms and optic disc and macular edema. Moreover, hypertension is among the key element of danger for development and succession of diabetic retinopathy, and its control has been demonstrated for the prevention of blindness from diabetic retinopathy.[15]

In spite of that, to the greatest of authors' knowledge, there's virtually no information for evaluating the association between duration of hypertension and presence of visual problems in hypertensive patients. Moreover, as it has also been reported that disturbance in vision is related with high possibility of mortality[16,17], its association with duration of hypertension is worth investigating. In the given context, collecting pertinent local data is essential for establishing a baseline for future comparisons and planning of targeted interventions. Our objective therefore was to study the relationship between duration of hypertension and vision problems in subjects with hypertension.

MATERIALS AND METHODS

Across-sectional survey was conducted on patients selected from the medical outpatient department of medicine of Shahida Islam Medical College and hospital after receiving approval from the ethical committee. After checking their eligibility, 307 patients with convenient sampling technique, of 18 or above ages, were selected in the study against a calculated sample size of 267 participants with 50% frequency of outcome factor, 95% confidence interval and 6% precision. Self-stated record of high blood pressure and being on prescription against hypertension were the inclusion criteria whereas the patients having the history of diabetes, cardiac events, neurological disorders, cluster headache, gastrointestinal disease and life-threatening obesity were excluded from the study.

Prior to interview, verbal approval was taken from every member of the study and all relevant information pertaining to the study was conveyed to the participants. Data regarding age, duration of hypertension and presence and types of vision problems in patients were evaluated with the help of a structured questionnaire developed specifically for the study. The obtained information were enrolled, cleaned and assayed on SPSS version 20. Descriptive analysis was done by calculating the frequency and percentage for categorical variables and means and standard deviations for continuous variables. For inferential analysis chi-square test was employed whereas the potential confounding effect of age was controlled by means of stratification. The significant level was at 0.05. The period of survey spanned over 4 months.

RESULTS

The total data collected were of 307 patients but after excluding missing data for various study variables the final data analyzed were of 293 patients.

The study results revealed that out of a total of 293 participants, 56.3% aged <50 years, 51.9% were males, 70.3% had hypertension for up to 5 years, 53.6% had vision problems whereas 44.9% had dark spots in field of vision (table 1), Moreover, the mean duration of hypertension in patients with vision problems was 5.64±6.18 years whereas that in patients without vision problems was 3.91±4.28 years (figure 1).

The study results further revealed a significant positive association between longer duration of hypertension and presence of vision problems (p=0.004) where patients with longer duration of hypertension had higher prevalence of vision problems than those with shorter duration (66.7% vs. 48.1%) (table 2).

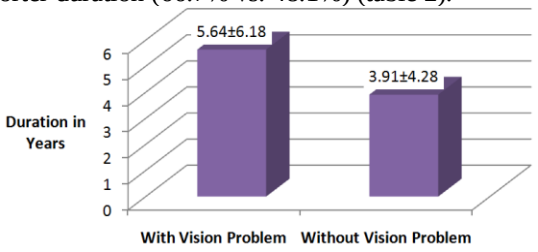

Figure No.1: Comparison of Mean Duration of Hypertension

Table No.1: Participants Profile

Variables (n=293)		Frequency(%)
Age	<50 Years	165(56.3)
	≥50 Years	128(43.7)
Gender	Male	152(51.9)
	Female	141(48.1)
Duration of Hypertension	Up to 5 Years	206(70.3)
	6 Years and Above	87(29.7)
Vision Problem	Yes	157(53.6)
	No	136(46.4)
Types of Vision Problem	Loss of Central/Peripheral Vision	47(30.1)
	Dark Spots in Field of Vision	70(44.9)
	Pain in Eyes	39(25.0)

Table No.2: Cross Tabulation between Duration of Hypertension and Vision Problems

Variable (n=293)		Vision Problems		P
		Yes (n=157)	No (n=136)	
		Frequency (%)	Frequency (%)	
Hypertension Duration	Up to 5 Years	99(48.1)	107(51.9)	0.004
	6 Years & Above	58(66.7)	29(33.3)	

Table No.3A: Duration of Hypertension and Vision Problems in Patients <50 Years Old

Variable (n=165)		Vision Problems		P
		Yes (n=82)	No (n=83)	
		Frequency (%)	Frequency (%)	
Hypertension Duration	Up to 5 Years	64(46.7)	73(53.3)	0.090
	6 Years & Above	18(64.3)	10(35.7)	

Table No.3B: Duration of Hypertension and Vision Problems in Patients ≥50 Years Old

Variable (n=128)		Vision Problems		P
		Yes (n=75)	No (n=53)	
		Frequency (%)	Frequency (%)	
Hypertension Duration	Up to 5 Years	35(50.7)	34(49.3)	0.051
	6 Years & Above	40(67.8)	19(32.2)	

Post stratification analysis to manage the potential confounding impact of age showed that the significant association earlier seen between duration of hypertension and presence of vision problems no longer persisted in any of the two age groups (p>0.05 for both) (tables 3A and 3B).

Moreover, cross tabulation between duration of hypertension and types of vision problems did not reveal any significant association (p=0.726) (table 4).

Table No.4: Cross Tabulation between Duration of Hypertension and Types of Vision Problems

Variable (n=156)		Types of Vision Problems			p
		Loss of Central/Peripheral Vision (n=47)	Dark Spots in Field of Vision (n=70)	Pain in Eyes (n=39)	
		Frequency (%)	Frequency (%)	Frequency (%)	
Hypertension Duration	Up to 5 yrs	27 (27.8)	45 (46.4)	25 (25.8)	0.726
	6 Yrs and Above	20 (33.9)	25 (42.4)	14 (23.7)	

DISCUSSION

The study results revealed a significant positive association between longer duration of hypertension and presence of vision problems in hypertensive patients where those with longer duration of hypertension had higher prevalence of vision problems than those with shorter duration though after age based stratification this association did not persist anymore. Furthermore, no significant association between duration of hypertension and types of vision problems was observed in the study participants.

As cited above, the relationship between hypertension and vision problems is already known.[13-15] Even though a thorough literature search did not reveal any pertinent local or international data, in light of this information, it can be reasonably suspected that greater time-span of hypertension leads to more chances of impairment of vision

A systematic analysis of dose management and compliance of medication published in 2001 revealed that easier and infrequent dosing course resulted in improved compliance.[18] Being an inclusion criterion, every hypertensive individual in our study was on anti-hypertensive medication. Because the compliance of

the study participants with the prescribed treatment was not the desired end point of the study, it was not assessed. But as anti-hypertensive medications are usually given as multiple therapies with multiple doses, it is not unlikely that the blood pressure level of hypertensive patients is not always well controlled because of potential for poor compliance. Another systematic review published in 2004 also reported blood pressure control while on anti-hypertensive medication to vary from 5.4% to 58%.[19]

In this context, and as expected, the preliminary assessment of the study data showed a significant positive association of longer duration of hypertension with higher prevalence of sleep apnea (p=0.004).

Naturally, advancement of age results in deterioration of multiple bodily functions, and vision is no exception. Literature also reports that visual impairment is largely confined to adults aged 50 years or more[20], and that 81% of those subjects who are 50 years of age or above are blind or have mild or severe visual disturbances.[21] The study participants were therefore stratified into two age based groups, using the above mentioned cut off of 50 years, to control for the potential confounding effect of their age. As apprehended, the initially observed association between duration of hypertension and presence of visual impairment did not appear in the post stratification analysis, signifying the age of the study participants to be a confounder indeed.

Nevertheless, as cited above, visual impairment adversely influences the life of an affected individual and its consequences are far reaching.[7-9] It is therefore duly suggested that any hypertensive patients with a prolonged disease history and/or advanced age should be screened for vision problems for their early detection and prompt treatment.

The study results did not show any association between duration of hypertension and types of vision problems, although loss of central/peripheral vision was observed to be more prevalent among patients with longer duration of hypertension as opposed to dark spots in field of vision and pain in eyes which were seen to be more common among patients with shorter duration of hypertension. As a thorough search did not reveal any relevant published data, this study finding could not be compared with previous pertinent literature.

Limitations: The assessment of duration of hypertension may have suffered from limitation of recall, an inherent weakness of a cross-sectional study design. Moreover, the vision problems were assessed by history only and not on eye examination. Use of convenient sampling technique due to resource constraint was another limitation of the study.

CONCLUSION

Conclusion and Recommendation: The study results revealed a positive association between longer duration of hypertension and presence of vision problems, although not after controlling for the confounding effect of age. Moreover, no significant association between duration of hypertension and types of vision problems was observed in the study participants. In order to prioritize the use of limited resources and identifying areas for selected interventions, early recognition of hypertensive profile at high risk for development of subsequent complications is imperative. Further evaluation of the study findings with more rigorous study designs and a larger sample size is therefore recommended to verify the observed results.

Author's Contribution:

Concept & Design of Study:	Muhammad Luqman Ali Bahoo
Drafting:	Muhammad Sarwar Khalid
Data Analysis:	Mazhar ul Haq
Revisiting Critically:	Muhammad Luqman Ali Bahoo, Muhammad Sarwar Khalid
Final Approval of version:	Muhammad Luqman Ali Bahoo

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Roger VL, Go AS, Lloyd-Jones DM, Benjamin EJ, Berry JD, Borden WB, et al. Heart disease and stroke statistics—2012 update. Circulation 2012; 125(1):e2-20.
2. Ezzati M, Lopez AD, Rodgers A, Vander Hoorn S, Murray CJ, Comparative Risk Assessment Collaborating Group. Selected major risk factors and global and regional burden of disease. The Lancet 2002;360(9343):1347-60.
3. Kearney MP, Whelton M, Reynolds K, Muntner P, Whelton KP, Heet J. Global burden of hypertension: analysis of worldwide data. Lancet 2005;365(9455): 217–23.
4. Raised blood pressure. WHO; 2018 [cited 2018 9th October]; Available from: http://www.who.int/gho/ncd/risk_factors/blood_pressure_prevalence_text/en/.
5. Salem H, Hasan DM, Eameash A, El-Mageed HA, Hasan S, Ali R. Worldwide prevalence of hypertension: A pooled meta-analysis of 1670 studies in 71 countries with 29.5 million participants. J Am Coll Cardiol 2018;71(11): A1819.
6. Noncommunicable Diseases Country Profile 2014 [database on the Internet]. World Health Organization. 2014 [cited October, 2018]. Available from: http://www.who.int/nmh/publications/ncd-profiles-2014/en/.
7. Langelaan M, de Boer MR, van Nispen RM, Wouters B, Moll AC, van Rens GH. Impact of

visual impairment on quality of life: a comparison with quality of life in the general population and with other chronic conditions. Ophthalmic Epidemiol 2007;14(3):119-26.
8. West SK, Rubin GS, Broman AT, Muñoz B, Bandeen-Roche K, Turano K. How does visual impairment affect performance on tasks of everyday life? The SEE Project. Salisbury Eye Evaluation. Archives of Ophthalmol (Chicago, Ill.: 1960) 2002;120(6):774.
9. World Report on Vision. WHO; 2018 [cited 2018 9th October]; Available from: http://www.who.int/blindness/vision-report/en/.
10. Jadoon MZ, Dineen B, Bourne RR, Shah SP, Khan MA, Johnson GJ, et al. Prevalence of blindness and visual impairment in Pakistan: the Pakistan National Blindness and Visual Impairment Survey. Investigative Ophthalmol Visual Science 2006; 47(11):4749-55.
11. Pascolini D, Mariotti SP. Global estimates of visual impairment: 2010. Bri J Ophthalmol 2012; 96(5):614.
12. Dineen B, Bourne RR, Jadoon Z, Shah SP, Khan MA, Foster A, et al. Causes of blindness and visual impairment in Pakistan. The Pakistan National Blindness and Visual impairment Survey. Br J Ophthalmol 2007.
13. Browning AC, Mengher LS, Gregson RM, Amoaku WM. Visual outcome of malignant hypertension in young people. Archives of Disease Childhood 2001;85(5):401-3.
14. Colucciello M. Retinal Vascular disease in hypertension: risk factor modification optimizes vision outcomes. Postgraduate Medicine 2005; 117(6):33-42.
15. Bhargava M, Ikram MK, Wong TY. How does hypertension affect your eyes? J Human Hypertension 2012;26(2):71.
16. McCarty CA, Nanjan MB, Taylor HR. Vision impairment predicts 5 year mortality. Br J Ophthalmol 2001;85(3):322-6.
17. Wang JJ, Mitchell P, Simpson JM, Cumming RG, Smith W. Visual impairment, age-related cataract, and mortality. Archives of Ophthalmol 2001; 119(8):1186-90.
18. Claxton AJ, Cramer J, Pierce C. A systematic review of the associations between dose regimens and medication compliance. Clinical Therapeutics 2001;23(8):1296-310.
19. Kearney PM, Whelton M, Reynolds K, Whelton PK, He J. Worldwide prevalence of hypertension: a systematic review. J Hypertension 2004;22(1): 11-9.
20. Resnikoff S, Pascolini D, Etya'Ale D, Kocur I, Pararajasegaram R, Pokharel GP, Mariotti SP. Global data on visual impairment in the year 2002. Bulletin of the world health organization 2004;82:844-51.
21. Bourne RR, Flaxman SR, Braithwaite T, Cicinelli MV, Das A, Jonas JB, et al. Magnitude, temporal trends, and projections of the global prevalence of blindness and distance and near vision impairment: a systematic review and meta-analysis. The Lancet Global Health 2017;5(9):e888-97.