

PREVALENCE AND ASSOCIATED FACTORS OF HYPERTENSION COMPLICATIONS AMONG HYPERTENSIVE PATIENTS: A HOSPITAL-BASED STUDY

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Received : 17/10/2022
Received in revised form : 22/11/2022
Accepted : 04/12/2022

Keywords:
Hypertension; Secondary complications; Stroke; Kashmir.

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DOI: 10.47009/jamp.2023.5.1.10

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (1); 34-38



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Abstract

Background: Cardiovascular diseases (CVDs) remain the leading cause of disability and death in the world among communicable diseases. Therefore, this study aimed to assess the prevalence and associated factors of hypertension complications among hypertensive patients. **Materials and Methods:** A cross-sectional study was conducted to assess the prevalence and associated factors of hypertension complications, from 1st June 2019 to 30th July 2022. Interview-guided self-administered questionnaire and a chart review were used for data collection. Statistical significance was set at a 95% confidence interval using a P value of ≤ 0.05 as a cutoff point. **Result:** In a total of 378 recruited hypertensive subjects, majority of the subjects were males 231 (61.1%) were males as compared to females. The subjects were having a mean age of 53.55 ± 16.65 years with a range of 20 to 85 years. Maximum representations of subjects were having a sedentary life and were having a history of first degree relatives among family members ($p < 0.05$). On further stratification of the subjects females, married people, farmers and self-employed, subjects with family history of hypertension, sedentary life style presented with a higher risk of getting HTN complications ($p < 0.05$). Joint family system presented with higher HTN complications as compared to nuclear families ($p = 0.05$). In this study, the overall prevalence of stroke complications was 24.9% followed by Diabetic mellitus (21.9%), dyslipidemia (21.2%), kidney disease (12.5%), heart disease (11.2%) and eye problem in 8.2%. **Conclusion:** In this study, being female, having sedentary life, having a family history of hypertension among first degree relatives are factors associated with hypertension complications. Similarly, stroke was the main complications associated with HTN.

INTRODUCTION

Hypertension (HTN) is characterized by increased systolic blood pressure (SBP) of at least 140 mmHg or diastolic blood pressure (DBP) of at least 90 mmHg. Uncontrolled blood pressure is a most common problem among HTN patients receiving treatment, according to several research conducted in various parts of the world.^[1,2,3] In the past two decades, non-communicable diseases like cardiovascular disease (CVD) have posed a significant threat to public health and continue to be the world's leading cause of death.^[1,2,3,4] Due to the fact that HTN causes CVDs, affects an estimated 1.13 billion people worldwide, and affects two-thirds of them in low and middle-income

countries.^[5] It is estimated that in 2025, 1.56 billion adults globally would have HTN, a 30% rise from today, with majority of these patients representing developing nations.

The available literature reports that 9.4 million fatalities globally each year are caused by the side effects of hypertension.^[6] HTN has been a major risk factor for ischemic and hemorrhagic stroke, congestive heart failure, coronary heart disease, and other peripheral arterial diseases.^[7,8,9] As a risk factor for ischemic and hemorrhagic stroke, there has been a substantial increase in incidence of stroke deaths globally.^[10]

In Kashmir HTN is a public health issue and associated complications like strokes (ischemic and hemorrhagic stroke) have been on the rise.

Uncontrolled blood pressure puts patients at risk for cerebrovascular, cardiovascular, and renal problems on its own.^[11] It is previously reported that a significant number of hypertension patients in Kashmir maintained blood pressure levels above the normal range despite having access to therapeutic alternatives.^[12] Numerous factors, including non-adherence, which may be changeable and has an impact on blood pressure control, have been linked in studies to insufficient HTN control.^[1,13,14] Similarly, another study a large proportion of participants reported that irrational use of anti-hypertensive medications, no salt restriction, inactive life style were the major risk factors for development of complications of hypertension.^[15] Moreover, among the commonly known risk factors for hypertension and its complication from modifiable risk factors are obesity, physical activity, diet, smoking and diabetes mellitus whereas gender, age, genetics, and race are not amenable to change risk factors.^[16,17] Additionally, common risk factors for hypertension, such as a family history of hypertension, diabetes, or being overweight, have been found to be strongly associated with high BP in this part of the world. Therefore, the aim of this study is to assess prevalence and associated factors of HTN complications among hypertensive patients from Kashmir-Northern state of India.

MATERIALS AND METHODS

Study Design and Subjects

This cross-sectional study was conducted to identify the major risk factors inducing hypertensive complications at the Government Medical College (GMC), Anantnag, Kashmir. The study was conducted from 1st June 2019 to 30th July 2022. All adult hypertensive patients (age ≥ 18 years) who visited the General Medicine out-patient department of GMC Anantnag during the study period. Hypertensive patients with duration of HTN of more than one year were included in the study. The systematic random sampling method was used to recruit the final participants.

Data Collection Process

The well trained post graduate doctors and Author himself collected the data from subjects. Previously available literature was taken as a reference to collect and prepare a data. Interview-directed self-administered questionnaires and a chart review was employed for data collection. Patients with HTN who were unable to write and read were interviewed. The well designed questionnaire includes both the socio- demographic characteristics and clinical status of the patients.

The presence of complications was diagnosed by the physician. The collected data were checked and

cleaned after completing the study before processing. During data collection, the fulfillment and completeness of all questions were checked by the corresponding author.

Statistical Analysis

Data were entered in to an excel file and analyzed using the STATA version 14. Descriptive statistics, like frequency distribution, mean, and percentage were employed for most variables. A binary logistic regression analysis was done to assess the relative importance of the explanatory variables on the HTN and its complications. Statistical significance was set at a 95% confidence interval using a P-value of ≤ 0.05 as a cutoff point.

RESULTS

Out of 378 hypertensive patients, the mean age of the subjects was 53.55 ± 16.65 years. Highest representation of the cases were of the older age group of >50 years (72.5%). Majority of the subjects were males [231 (69.0%)] and had rural place of residence with a percentage of 61.1. Majority of the subjects were married (75%); farmers or self employed by occupation and with comparatively low socio economic status. Family history of HTN among the family members seems to be a common trend among the participating subjects, 44.4 % of the subjects were a positive history of HTN among family members. Similarly, active smoking (39.7%); physically inactive (73.0%) and Hypertension (86.5) was a common feature among the participating subjects [Table 1].

On stratification of the subjects on the basis of possible complications, we observed a significant effect of HTN among subjects when variables were classified on the basis of different groups. From the sociodemographic characteristics females presented with a higher risk of getting HTN complications ($p = 0.32$). Married people presented with higher HTN complications as compared to single ($p = 0.05$). Compared to government employed participants, farmers and self employed subjects were more likely to develop complications ($p = 0.05$). Participants with family history of hypertension were substantially at more risk of getting complication as compared to those with no family history of hypertension ($p = 0.001$). Participants who had active physical activity were less likely to develop complication than those who had sedentary physical activity ($p = 0.002$) [Table 2].

In this study, the overall prevalence of stroke complications was 115 (24.9%). Diabetic mellitus 101 (21.9%) was the most reported complication by hypertensive patients, followed by dyslipidemia 98 (21.2%), kidney disease 58 (12.5%), heart disease 52 (11.2%) and eye problem 38 (8.2%) [Table 3].

Table 1: The general characteristics of participating subjects

Variable Category	Frequency	Percent
Mean age	53.55 ± 16.65	
Age group		
<30	33	8.7
30–50	70	18.5
>50	275	72.7
Gender		
Male	261	69.0
Female	117	31.0
Residence		
Urban	147	38.9
Rural	231	61.1
Marital status		
Single	92	24.3
Married	286	75.7
Occupation		
Government	88	23.3
Non-government	40	10.6
Self-employed	157	41.5
Farmer	82	21.7
Student	11	2.9
Income		
<1000	155	41.0
1000–3000	142	37.6
3000–5000	17	4.5
>5000	64	16.9
Family history		
Yes	168	44.4
No	210	55.6
Smoking		
Yes	150	39.7
No	228	60.3
Physical activity		
Sedentary	276	73.0
Moderate	102	37.0
Blood pressure		
Normal	51	13.5
Hypertension	327	86.5

Table 2: Associated risk factors of hypertension complications.

Variables	Categories	Complication/s		P-value
		Yes	No	
Age in years	<30	15 (45.4)	18 (54.6)	0.987
	30–45	33 (47.1)	37 (52.9)	
	>45	181 (65.9)	94 (34.1)	
Gender	Male	156 (59.8)	105 (40.2)	0.032
	Female	88 (75.2)	29 (24.8)	
Residence	Urban	112 (76.2)	35 (24.8)	0.426
	Rural	142 (61.5)	89 (38.5)	
Marital status	Single	29 (31.5)	63 (68.5)	0.05
	Married	163 (57.0)	123 (43.0)	
Occupation	Government	56 (63.6)	32 (36.4)	0.042
	Non-government	31 (77.5)	09 (22.5)	
	Self-employed	117 (76.5)	40 (23.5)	
	Farmer	30 (36.6)	52 (63.4)	
	Student	01 (9.1)	10 (90.9)	
Income	<1000	60 (61.3)	55 (47.8)	0.032
	1000–3000	87 (62.6)	55 (37.7)	
	3000–5000	09 (52.9)	08 (47.1)	
	>5000	54 (84.4)	10 (15.6)	
Family history of HTN	Yes	122 (89.7)	36 (10.3)	0.001
	No	116 (50.9)	112 (49.1)	
Smoking	Yes	106 (70.7)	44 (29.3)	0.282
	No	28 (12.7)	192 (87.3)	
Physical activity	Sedentary	126 (45.6)	150 (54.3)	0.002
	Active	27 (26.5)	75 (73.5)	

Table 3: Complication of hypertension.

Complication	Frequency (n = 378)	Percent
Stroke	115	24.9
Diabetic mellitus	101	21.9

Dyslipidemia	98	21.2
Heart disease	52	11.2
Eye problem	38	08.2
Kidney disease	58	12.5

*Some subjects have one or more combinations

DISCUSSION

Non-communicable diseases (NCDs) are a major threat to the world being the highest health concern as far its incidence and mortality is concerned. Among various NCDs cardiovascular diseases (CVDs) present with the majority of total cases as well as mortality is concerned. In CVDs, raised blood pressure is a major risk factor and can have a number of health complications like stroke, coronary heart disease, chronic heart disease, peripheral vascular disease, renal impairment, and heart failure.^[18]

The most common complications of hypertension in this study include stroke, diabetes mellitus, dyslipidemia, kidney disease, stroke and heart diseases. Among these, stroke seems to be the most common complication in the study population followed by Diabetes mellitus was the most common complications followed by dyslipidemia, kidney disease, and eye diseases. Being female, farmers, illiteracy, family history and sedentary life style were significantly associated risk factors for HTN and its complications. smoking were not associated risk factors for complications of HTN in this study.

Several studies have revealed that age was not an associated risk factor for HTN and its complications, unlike other studies that reported age was independently associated with hypertension that hypertension-related morbidity increases with increased age along with subsequent complications.^[19,20,21] IN current study we observed that subjects with a first degree relative effected with developed more complications. This is in compliance with other findings and reported that the association was due to family history increases the risk of developing hypertension.^[1,22,23] This seems to be due to having same genetic set up besides sharing the same life style and dietary habits.^[24]

Participants who are physically more active developed less complications than participants' sedentary life style. This is in line with other studies and such association was because of the decreased activity in less than 10 min daily increased risk of hypertension.^[20,25] Similarly, a study in India showed lack of physical exercise was the major risk factor for the development of complications of hypertension Ref) Moreover, studies have reported that excess body weight and living a sedentary lifestyle predispose an individual to hypertension and its complications.^[25]

The major limitations of the study could be the smaller sample size and recall bias, however, this is the first of its kind study done in study population

with a number of factors being assessed for possible HTN complication.

CONCLUSION

In this study being female, illiterate participants, having a family history of hypertension, and being physically less active are strongly associated risk factors for HTN. There needs to be proper health related guidelines to HTN subjects on the possible etiology of HTN and complications thereon. Implementation of proper awareness cum screening programs by health professionals is key in managing these health issues. Although, proper use of medications, maintaining regular physical activities and healthy diet can not be ruled out. good nutrition.

Acknowledgments

We would like to acknowledge the volunteer participation of the patients and all the paramedical staff involved in this study.

REFERENCES

1. Kifle ZD, Adugna M, Chanie GS, Mohammed A. Prevalence and associated factors of hypertension complications among hypertensive patients at University of Gondar Comprehensive Specialized Referral Hospital. *Clin Epidemiology Glob Health*. 2022;13:100951.
2. Iloh GUP, Ofoedu JN, Njoku PU, Amadi AN, Godswill-Uko EU. Medication adherence and blood pressure control amongst adults with primary hypertension attending a tertiary hospital primary care clinic in Eastern Nigeria. *Afr J Prim Health Care Fam Med*. 2013;5(1):446. doi: 10.4102/phcfm.v5i1.446.
3. Sadeghi E, Behnood-Rod A, Aerab-Sheibani H, Shobeiri E, Pourzargar P, Ormoz E, et al. Controlled Blood Pressure in Iranian Patients: A Multi-Center Report. *Glob J Health Sci*. 2015;8(4):188-95. doi: 10.5539/gjhs.v8n4p188.
4. Aggarwal A, Patel P, Lewison G, Ekzayez A, Coutts A, Fouad FM, et al. The Profile of Non-Communicable Disease (NCD) research in the Middle East and North Africa (MENA) region: Analyzing the NCD burden, research outputs and international research collaboration. *PLoS One*. 2020;15(4):e0232077. doi: 10.1371/journal.pone.0232077.
5. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. *Lancet*. 2005;365(9455):217-23. doi: 10.1016/S0140-6736(05)17741-1.
6. Zinat Motlagh SF, Chaman R, Ghafari SR, Parisay Z, Golabi MR, Eslami AA, et al. Knowledge, Treatment, Control, and Risk Factors for Hypertension among Adults in Southern Iran. *Int J Hypertens*. 2015;2015:897070. doi: 10.1155/2015/897070.
7. Lawes CM, Bennett DA, Parag V, Woodward M, Whitlock G, Lam TH, et al. Blood pressure indices and cardiovascular disease in the Asia Pacific region: a pooled analysis. *Hypertension*. 2003;42(1):69-75. doi: 10.1161/01.HYP.0000075083.04415.4B.
8. Zimmerman MC, Lazartigues E, Sharma RV, Davisson RL. Hypertension caused by angiotensin II infusion involves increased superoxide production in the central nervous system. *Circ Res*. 2004;95(2):210-6. doi: 10.1161/01.RES.0000135483.12297.e4.

9. UK Prospective Diabetes Study Group. Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. *UK Prospective Diabetes Study Group. BMJ.* 1998;317(7160):703-13.
10. Klein R, Klein BE, Moss SE, Davis MD, DeMets DL. Is blood pressure a predictor of the incidence or progression of diabetic retinopathy? *Arch Intern Med.* 1989;149(11):2427-32.
11. Scherhag A, Kaden JJ, Kentschke E, Sueselbeck T, Borggrete M. Comparison of impedance cardiography and thermodilution-derived measurements of stroke volume and cardiac output at rest and during exercise testing. *Cardiovasc Drugs Ther.* 2005;19(2):141-7. doi: 10.1007/s10557-005-1048-0.
12. Chachoo J, Mushtaq N, Jan S, Majid S, Mohammad I. Clinical variables accompanying salt-sensitive essential hypertension in ethnic Kashmiri population. *J Hypertens.* 2022;40(5):916-923. doi: 10.1097/HJH.0000000000003093.
13. Im SI, Rha SW, Choi BG, Choi SY, Lee JJ, Ki Lee S, et al. Impact of uncontrolled hypertension on 12-month clinical outcomes following below-the-knee arteries (BTK) interventions in patients with critical limb ischemia. *Clin Hypertens.* 2016;22:9. doi: 10.1186/s40885-016-0044-y.
14. Boima V, Ademola AD, Oduola AO, Agyekum F, Nwafor CE, Cole H, et al. Factors Associated with Medication Nonadherence among Hypertensives in Ghana and Nigeria. *Int J Hypertens.* 2015;2015:205716. doi: 10.1155/2015/205716.
15. Kumar C, Sasi Sekhar T, Sahithi B. Hypertension—the silent killer, awareness of the risk factors and complications of hypertension among hypertensives. *Int J Adv Res.* 2006;4(6):1277–1281.
16. Jaddou HY, Batiehah AM, Ajlouni KM. Prevalence and associated factors of hypertension: results from a three community-based survey, Jordan. *J Hum Hypertens.* 1996;10(12):815-21.
17. Wamala JF, Karyabakabo Z, Ndungutse D, Guwatudde D. Prevalence factors associated with hypertension in Rukungiri district, Uganda—a community-based study. *Afr Health Sci.* 2009;9(3):153-60.
18. Ombada M, Ombada M. Diagnosing hypertension among adults; A study based on prevention-management of primary and secondary hypertension. *Global J Health Sci.* 2020;12(2):1–61.
19. Abebe SM, Berhane Y, Worku A, Getachew A. Prevalence and associated factors of hypertension: a cross-sectional community based study in Northwest Ethiopia. *PLoS One.* 2015;10(4), e0125210.
20. Awoke A, Awoke T, Alemu S, Megabiaw B. Prevalence and associated factors of hypertension among adults in Gondar, Northwest Ethiopia: a community based cross-sectional study. *BMC Cardiovasc Disord.* 2012;12(1):1–6.
21. Giday A, Tadesse B. Prevalence and determinants of hypertension in rural and urban areas of southern Ethiopia. *Ethiop Med J.* 2011;49(2):139–147
22. Devadason P, Sabarinath M, Reshma Dass R, Sameena A, Fathima SS, Mathiarasu AM, et al. Risk factors for hypertension and its complications—a hospital based case control study. *Int J Interdiscipl Multidiscip Stud.* 2014;1(4):160–163.
23. Mandago K, Mghanga FP. Awareness of risk factors and complications of hypertension in southern Tanzania. *J Community Health Res.* 2018;7(3):155–163.
24. Carmelli D, Robinette D, Fabsitz R. Concordance, discordance and prevalence of hypertension in World War II male veteran twins. *J Hypertens.* 1994;12(3):323–328.
25. Tesfaye F, Byass P, Wall S. Population based prevalence of high blood pressure among adults in Addis Ababa: uncovering a silent epidemic. *BMC Cardiovasc Disord.* 2009;9(1):1–10.