

Prevalence of Hypertension and its Associated Risk Factors among People Living in Rishikesh, Uttarakhand

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Abstract

Background: India is in a state of epidemiological, economic, demographic and nutrition transition. And all these transitions are leading to non communicable diseases. Hypertension is a major public health problem and important area of research due to its high prevalence and being major risk factor for cardiovascular diseases and other complications.

Objectives: To find out the prevalence of hypertension and its associated risk factors among people living in study area.

Methodology: It is a community based cross sectional study conducted among people living in Barrage colony of Rishikesh, Uttarakhand. House to house survey was conducted for 3 months from December 2018 to February 2019 in all the four blocks (A,B,C,D) of Barrage colony, Rishikesh, Uttarakhand, to make a sample size of 955. Both male and female age of 15 years and above was included in the study.

Results: The prevalence of hypertension among study participants was 10.4%. Prevalence of hypertension was found more in male subjects (12.6%) as compared to females subjects (6.9%). The risk factors found to be significantly associated with HTN in this study were increasing age, male gender, central obesity (high WHR), diabetes, smoking, alcohol, sedentary lifestyle and excess salt intake.

Conclusion: There is significant burden of hypertension in Barrage colony, Rishikesh. Strong public health measures need to be seriously implemented to combat hypertension and its consequences.

Keywords –Epidemiological transition, Prevalence, Non communicable diseases, Hypertension

Introduction

India is undergoing a rapid epidemiological transition with the increase in the incidence of noncommunicable diseases (NCD), such as cardiovascular diseases (CVD), cancer, chronic obstructive pulmonary disease, stroke, chronic kidney disease (CKD), and blindness, some of which are often referred to as lifestyle diseases. Among them, systemic hypertension is a very important disorder

by itself and is also a strong risk factor for CVD, stroke, and CKD^{1,2}. Systemic arterial hypertension is defined as a state of chronically elevated arterial blood pressure, as compared to what is normally expected, as per the defined level given in JNC-VII. Prehypertension is also associated with an increased risk of major cardiovascular events, independent of other cardiovascular risk factors³.

The recent WHO report states that considering the prevalence of any diseases, hypertension ranks fourth in the world⁴. As it is hidden beneath an outwardly asymptomatic appearance, the disease does immense harm to the body in the form of “Target organ” damage hence the WHO is named it the “silent killer”⁴. Hypertension affects approximately 1 billion people worldwide. Raised blood pressure is estimated to cause

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about 7 million premature deaths throughout the world, and 4.5% of the disease burden (64 million disability-adjusted life years (DALYs))⁴.

Hypertension is one of the commonest non-communicable diseases in India, with an overall prevalence of 29.8% among the adult population⁴. Recent studies showed that for every known person with Hypertension, there are two persons with either undiagnosed Hypertension or prehypertension. Various community-based studies have recorded prevalence of Hypertension in India to be ranging from 30%–40% in urban and 10–20% in rural areas. It is directly responsible for 57% of all stroke deaths and for 24% of cases of coronary heart diseases in India. Only scant data are available on the prevalence of risk factors in different geographical areas in India⁵.

In Uttarakhand, hypertension is more prevalent in males (13.1%) than females (7.2%) as per NFHS 4 estimates⁶.

There is an urgent need to check the increasing burden of Hypertension. This study was undertaken to know the actual burden of Hypertension and its risk factors in rural areas to facilitate the planning of strategies for prevention and control and to facilitate the surveillance of risk factors.

Objectives

1. To estimate the prevalence of hypertension among people living in Barrage colony, Rishikesh, Uttarakhand.
2. To estimate the risk factors associated with hypertension among people living in Barrage colony, Rishikesh, Uttarakhand.

Methods and Materials

Study Design: Cross sectional community based study.

Study Area: Barrage colony, Rishikesh, Uttarakhand

Study Period: Threemonths from December 2018 to February 2019

Study Subjects :People aged 15 years and above

who are the permanent residents in the Barrage colony, Rishikesh, Uttarakhand.

Sampling Technique: :People living in all the 4 blocks (A,B,C,D) of Barrage Colony were included in the study by house to house survey, and we were able to collect demographic data on all residents, though some residents refused to undergo full assessment, making a total sample size of 955.

Inclusion criteria:

1. All individuals (male and female) more than and equal to 15 years.
2. All those who gave consent to participate.

Exclusion criteria:

1. Individuals less than 15 years of age.
2. Those absent on the day of visit and did not give consent to participate in study.

Data Collection: A detailed history was obtained by interview using a pretested and semi-structured questionnaire, to collect data on socio-demographic factors, co-morbidities, lifestyle and anthropometric measurements of height, weight, body mass index (BMI), waist circumference, and waist-hip ratio (WHR) were assessed using standard guidelines⁷.

Blood pressure measurements :

BP was measured twice (10 minutes apart) for each study subject, with a calibrated mercury sphygmomanometer using standard guidelines.⁸ It was measured to the nearest 2 mm Hg and the average of two readings was taken as the mean BP.

HTN definition :HTN was defined as sustained elevation of systolic BP ≥ 140 mmHg and /or diastolic BP ≥ 90 mmHg, and also included study subjects who were on antihypertensive medication (JNC 7)⁹.

Statistical Analysis:Data was entered in Microsoft excel and analysed using SPSSv21. Pearson's Chi square test was applied. P value < 0.05 was considered significant. All the statistical significances were evaluated as 95% confidence interval.

Results

In our study out of total 955 participants, 440 (46.07%) were males and 515 (53.9%) females. Majority of study participants belonged to the age group 25-34 years 235 (24.6%), were married 883 (92.4%), were literate 903 (94.5%), Hindu 798 (83.7%) and employed 492 (51.5%).

Table 1 depicts that Out the 955 study subjects, there were 99 hypertensives, as per JNC 7 classification.

The prevalence of HTN was 10.4%. Among the hypertensives, 57 (57.6%) were previously diagnosed cases of HTN while 42 (42.4%) were new cases detected in this study.

Table 2 shows that The prevalence of HTN was found to increase with age, male gender, central obesity (high WHR), overweight, diabetes, smoking, alcohol, sedentary lifestyle and excess salt intake. and this association was found to be statistically significant ($p < 0.05$).

Table 1: Prevalence and category of hypertension among study subjects

Category of Hypertension	Number	Percentage (%)
By JNC VII classification of HTN (n=955)		
Normotensives	856	89.6
Hypertensives	99	10.4
By new and old cases of HTN (n=99)		
Newly diagnosed cases	42	42.4
Previously diagnosed cases	57	57.6

Table 2: Association between probable risk factors and HTN

S.No.	Category	Hypertensives No.(%)	Normotensives No. (%)	Total (%)	P value
1.	Age				
	15-34	17 (5.2)	309 (94.8)	326 (34.1)	P < 0.05
	35-54	31 (7.6)	377 (92.4)	408 (42.7)	
	55-74	51 (23.1)	170 (76.9)	221 (23.2)	
2.	Sex				
	Male	62 (14.1)	378 (85.9)	440 (46.1)	P < 0.05
	Female	37 (7.2)	478 (92.8)	515 (53.9)	
3.	H/o Salt intake				
	High (>5gm)	75 (31.9)	160 (68.1)	235 (24.6)	P < 0.05
	Normal	24 (3.4)	696 (96.6)	720 (75.4)	
4.	H/o Diabetes				
	Yes	85 (56.7)	65 (43.3)	150 (15.7)	P < 0.05

Cont... Table 2: Association between probable risk factors and HTN

	No	14 (1.7)	791 (98.3)	805 (84.3)	
5.	H/o dyslipidemia				
	Yes	90 (36.6)	156 (63.4)	246 (25.8)	P < 0.05
	No	9 (1.3)	700 (98.7)	709 (74.2)	
6.	Physical activity				
	Yes	25 (7.1)	325 (92.9)	350 (36.6)	P < 0.05
	No	74 (12.2)	531 (87.8)	605 (63.4)	
7.	Central obesity: Waist-Hip Ratio (WHR)				
	High	82 (28.4)	207 (71.6)	289 (30.3)	P < 0.05
	Normal	17 (2.6)	649 (97.4)	666 (69.7)	
8.	Smoking				
	Yes	78 (20.8)	297 (79.2)	375 (39.3)	P < 0.05
	No	21 (3.6)	559 (96.4)	580 (60.7)	
9.	Alcohol				
	Yes	62 (17.7)	288 (82.3)	350 (36.6)	P < 0.05
	No	37 (6.1)	568 (93.9)	605 (63.4)	
10.	General Obesity (BMI)				
	Overweight/obese	75 (31.9)	160 (68.1)	235 (24.6)	P < 0.05
	Normal weight	24 (3.4)	696 (96.6)	720 (75.4)	

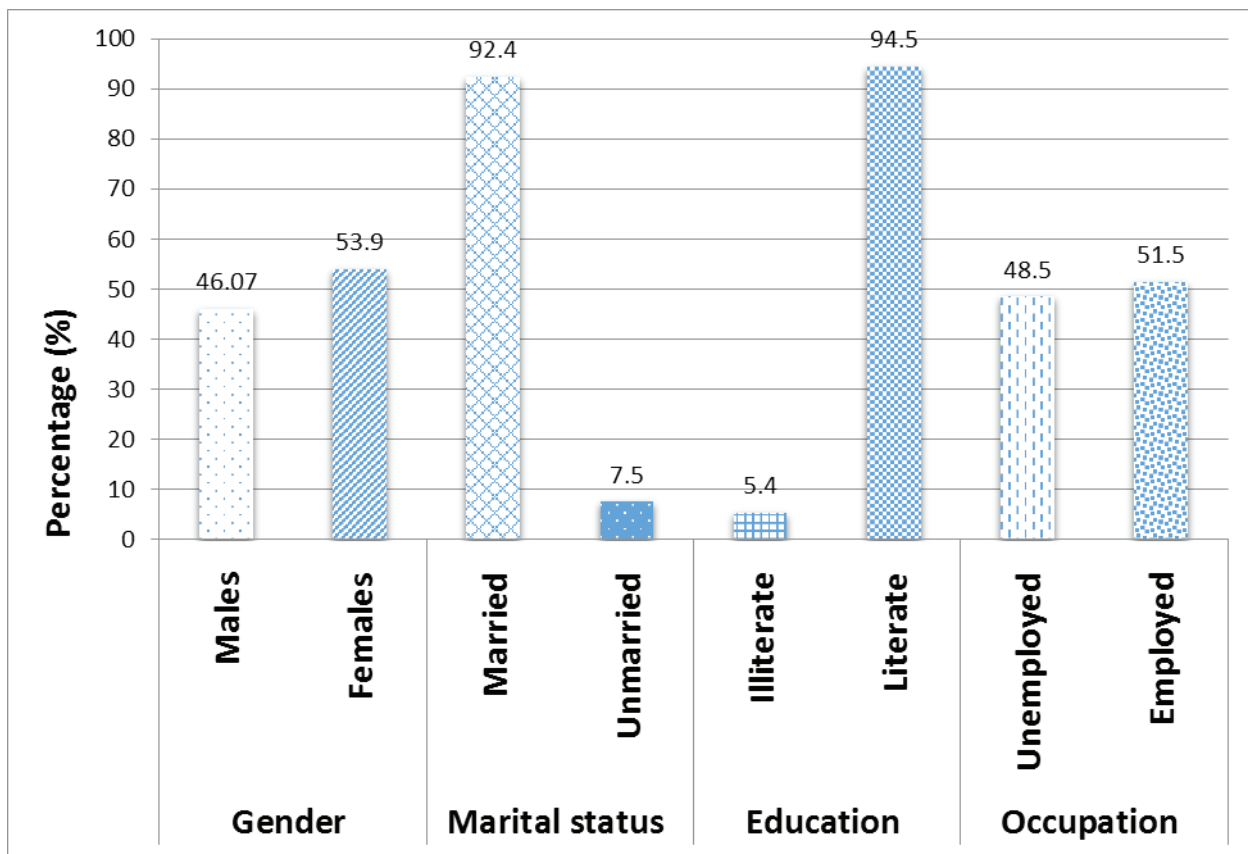


Fig 1: Distribution of study subjects according to socio-demographic characteristics

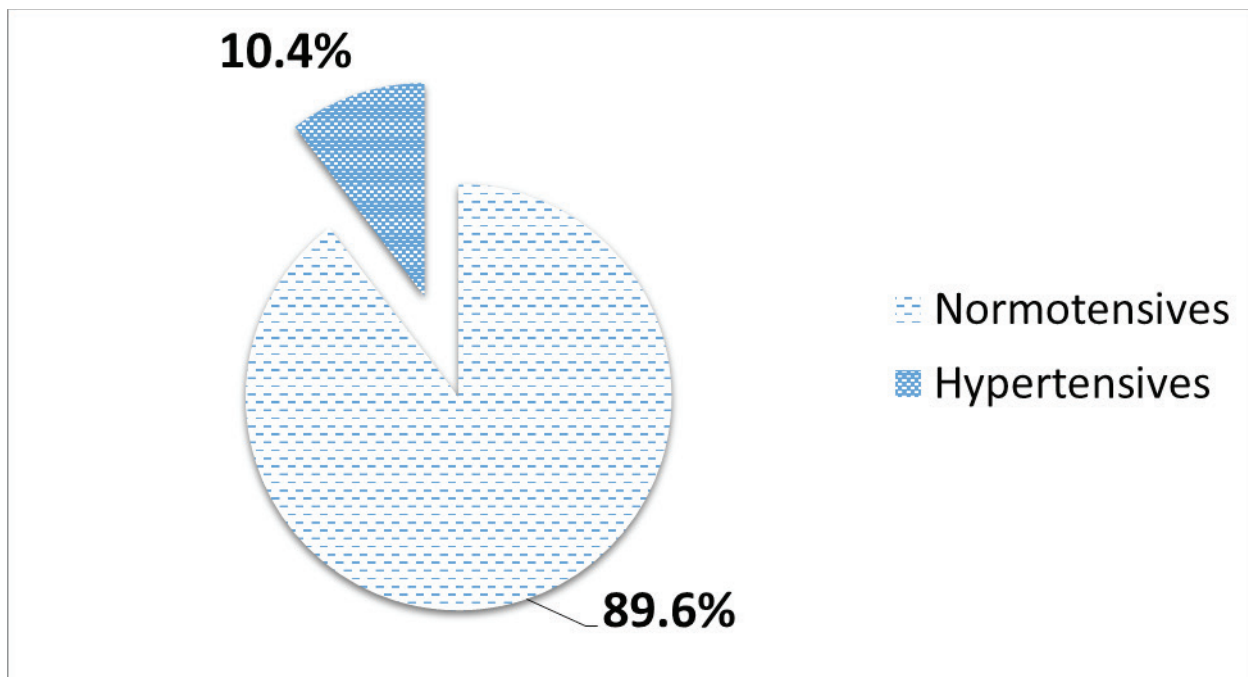


Fig 2: Prevalence of hypertension among study participants

Discussion

In our study, 99 were found to have hypertension giving a prevalence of 10.4%. Among them 57.6% of hypertensives were already diagnosed to have HTN while 42.4% were newly detected hypertensives. This shows the submerged portion of the iceberg.

A similar study conducted by Chethana KV et al.¹⁰ in Karnataka, in urban people aged 18-65 years in 2017 showed higher prevalence of hypertension in men (37.3%) than in women (28.9%).

In our study there was increased prevalence of HTN as age increases which is similar to study done by Chethana KV et al.¹⁰ and Simon C et al.¹¹.

In our study the risk factors found to be significantly associated with HTN were increasing age, male gender, central obesity (high WHR), diabetes, smoking, alcohol, sedentary lifestyle and excess salt intake which is similar to study done by Chethana KV et al.¹⁰, Simon C et al.¹¹, Kannan et al.¹² and Prasanth et al.¹³

Conclusion

The prevalence of hypertension among study participants in Barrage colony, Rishikesh, was 10.4%. Prevalence of hypertension was found more in male subjects (14.1%) as compared to female subjects (7.2%). The risk factors found to be significantly associated with HTN in this study were increasing age, male gender, central obesity (high WHR), diabetes, smoking, alcohol, sedentary lifestyle and excess salt intake. The results of this community-based cross-sectional study points to the multi-factorial etiology of hypertension.

Recommendations

This study brought to our notice that Hypertension in the study area was a significant problem. It also revealed that lifestyle risk factors were highly prevalent and significantly associated with the disease. There is plenty of scope for early detection and control of risk factors and motivation/education for risk factor modification/prevention of establishment of risk factors. There was also a need for the early detection of prehypertension and established Hypertension and for the treatment of the affected individuals through appropriate community-based screening and treatment

strategies. This study provided useful data for planning and implementing Hypertension prevention programs in the community. Creating awareness about the harmful effects of sedentary lifestyle, central obesity, use of excess salt and alcohol and smoking should be initiated in the community.

Limitation of the study:

As this study was done in small area so the results obtained cannot be generalized to the whole population.

Relevance of the study

Hypertension is a very important disorder by itself and is also a strong risk factor for CVD, stroke, and CKD. Studies showed that for every known person with Hypertension, there are two persons with either undiagnosed Hypertension or prehypertension. There is an urgent need to check the increasing burden of Hypertension.

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Conflict of Interest: Nil

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References

1. Park K. Text Book of Preventive and Social Medicine. 24th edition. Jabalpur: m/s BanarsidasBhanot; 2017. p 380-81.
2. Agarwal S, Basannar DR, Bhalwar R, Bhatnagar A, Bhatti VK, Chatterjee K et al Textbook of Public Health and Community Medicine. Pune: AFMC in collaboration with WHO, India. 2009;1041-1101.
3. Joshi SR, Saboo B, Vadivale M, Dani SI, Mithal A, Kaul U, et al. Prevalence of diagnosed and undiagnosed diabetes and hypertension in India—results from the Screening India's Twin Epidemic (SITE) Study. *Diabetes Technol Ther* 2012;14:8–15
4. Government of India. Screening, Diagnosis,

- Assessment, and Management of Primary Hypertension in Adults in India, May 2016. [Cited on 2019 April 4]. Available from: <https://www.medbox.org/preview>
5. Prathyusha TVD, Prasad VG, Saiprasad GS, Nagaraj K. A study of prevalence and certain lifestyle risk factors of essential hypertension in a rural area in Telangana, India. *Int J Med Sci Public Health* 2016;5:1417-1422
 6. NFHS-4 Uttarakhand state report. [Cited on 2019 March 2]. Available from: <http://www.rchiips.org/nfhs4/uttarakhand>
 7. Lim SS1, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010 : a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2012;380 (9859):2224-60.
 8. World Health Organization. Global status report on non-communicable diseases 2010. Geneva, World Health Organization, 2011.
 9. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL, et al. The seventh report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure the JNC-7 Report. *JAMA*. 2003;289(19):2560-72.
 10. Chethana K. V., Anusha T., et al. Prevalence of hypertension and its risk factors among adults in urban field practice area NMC, Raichur, Karnataka, India. *Int J Community Med Public Health*. 2017 Jan;4(1):45-50
 11. Simon C, Saju C R et al. Prevalence and risk factors of hypertension among adults aged 25-64 years in a rural area of Thrissur in Kerala. *Int J Community Med Public Health*. 2017 May;4(5):1714-1721
 12. Simon C, Saju C R et al. Prevalence and risk factors of hypertension among adults aged 25-64 years in a rural area of Thrissur in Kerala. *Int J Community Med Public Health*. 2017 May;4(5):1714-1721
 13. Prasanth TS, Vijayakumar K. Prevalence of Systemic Hypertension among the rural residents of Kerala. *Calicut Med J*. 2008;6(3):e4.