ORIGINAL ARTICLE

Prevalence of hypertension and its risk factors among individuals attending outpatient department of rural health training centre, Haldwani

Janki Bartwal[1], Sadhana Awasthi[2], Chandra Mohan Singh Rawat[3], Rajesh Kumar Singh[4]

[1]Resident, [2]Associate Professor, [3]Professor & HOD, [4]Assistant Professor, Department of Community Medicine, Government Medical College, Haldwani, District - Nainital, Uttarakhand.

Corresponding Author

Address for Correspondence: Janki Bartwal, Post Graduate Student, Community Medicine, GMC, Haldwani, Uttarakhand.
E Mail ID: jankibartwal@yahoo.in

Citation

Bartwal J, Awasthi S, Rawat CMS, Singh RK. Prevalence of hypertension and its risk factors among individuals attending outpatient department of rural health training centre, Haldwani. Ind J Comm Health. 2014;26(1):76-81.

Source of Funding : Nil, **Conflict of Interest:** None declared

Abstract

Introduction: Hypertension is one of the major health and development challenges of the 21st century, which, for most countries, has developed together with rapid cultural and social changes, ageing populations, increasing urbanization, dietary changes, reduced physical activity, and other unhealthy behaviours. **Objectives:** 1) To find out the prevalence of Hypertension in study subjects 2) To identify the risk factors associated with Hypertension. **Materials and Methods:** A Cross-sectional study was carried out among 369 individuals of 30 years and above attending Out Patient Department (OPD) in Rural Health Training Centre (RHTC) under the Department of Community Medicine, Government Medical College, Haldwani during June 2013-August 2013. A pretested predesigned questionnaire was used to collect demographic data by interview technique .The blood pressure was recorded and classified using JNC VII criteria to grade hypertension. Data was compiled, entered & analyzed using SPSS version 20. **Results:** Among 369 patients, the prevalence of hypertension was 41.7%; out of this, 28.7% were aware of their hypertensive status while 13% were newly diagnosed cases. The association between hypertension with increase in age, family history of hypertension, increase salt intake, consuming mixed diet, increase waist circumference, waist hip ratio and body mass index was found significant. Physical inactivity, gender, tobacco and alcohol consumption were not significantly associated with hypertension. **Conclusions:** The prevalence of hypertension in rural area is relatively high. Extensive efforts are required for raising the awareness level & regular screening of high-risk population is recommended for preventing the complications & disability.

Key Words

Screening; Hypertension; Risk factors; Out Patient Department; Rural Health Training Centre

Introduction

All nations, rich and poor are suffering from the impact of the Hypertension epidemic. Globally, nearly one billion people have high blood pressure (hypertension); of these, two-thirds are in developing countries. (1) Hypertension is one of the most important causes of premature death worldwide and the problem is growing; in 2025, an estimated 1.56 billion adults will be living with hypertension. (1)

Hypertension is a silent, invisible killer because it often has no warning signs or symptoms, and many people do not realize they have it until the end organ damages have occurred; that is why it's important to get blood pressure checked regularly.

Against this background and with the objective of benefiting the people of our rural field practice area by screening them for hypertension and associated risk factors this study was conducted.

Aims & Objectives

1) To find out the prevalence of Hypertension in study subjects 2) To identify the risk factors associated with Hypertension.

Material and Methods

An OPD based cross sectional study was conducted among individuals aged 30 years and above in Rural Health Training Centre, Motahaldu under the Department of Community Medicine, Government Medical College in Haldwani Block of District Nainital during June 2013 to August 2013. Ethical approval for the study was obtained from Institutional Ethics Committee. An informed verbal consent was taken from the participants after explaining them the purpose of this study.

A predesigned, pretested, structured questionnaire was used to obtain demographic data, personal and family history of hypertension, behavioural aspects, including, tobacco use, alcohol use, dietary habits, salt intake and physical activity. Blood pressure (BP) and anthropometric data was recorded. The sample size was calculated by using $(1.96)^2pq/d^2$,where p=40% (considering the fact that globally, the overall prevalence of raised blood pressure in adults aged 25 years and over was around 40 percent in 2008) (2), q=100-p= 60% and d (absolute error) =5%. The sample size came out to be 369. **Inclusion criteria:** The individuals aged 30 years and above attending the OPD of RHTC of department of community medicine.

Exclusion criteria: The individuals of below 30 years and a pregnant female of any age group were excluded from the study.

Anthropometric Measurements

Height - measured to the nearest centimeter using a wall mounted measuring tape with the subject standing erect and barefoot.

Weight- measured to the nearest 0.5 kg using a Krups weighing scale. **Body Mass Index (BMI)** - calculated as body weight in kilograms (kg) divided by square of the height in meter (m^2). **Waist circumference (WC)** - measured using a non-stretchable measuring tape. Subjects were asked to stand erect with both feet together. One layer of clothing was accepted. WC was measured at the smallest horizontal girth between the costal margins and the iliac crest. **Hip circumference (HC) -** measured at the level of greater trochanters with a subject in standing position & both feet together.

Waist to Hip ratio (WHR) - calculated with the corresponding values of waist and hip circumference.

Blood Pressure (BP) - BP was measured using mercury sphygmomanometer in the sitting posture with an appropriate- sized cuff encircling the arm. Two readings were taken in a resting patient at a 5-minutes interval, and the average of the two readings was reported.

Operational Definitions

Tobacco users - who at the time of survey were using tobacco products in any form either daily or occasionally for at least past one year. **Alcohol users -** who were consuming alcohol either daily or occasionally for at least past one year. **Salt intake -** increased if adding salt on top of cooked food, salad, consuming pickles or chutney daily. **Dietary Habits-** Vegetarian was defined as those who consume cereals, pulses, vegetables, fruits, nuts, milk and milk products. Mixed diet includes eggs, meat in addition to vegetarian diet.

Physically active - 30 minutes of daily brisk walk on most days (5) of the week.

BMI– Individuals were classified into four groups: Underweight (BMI = <18.5kg/m^2), Normal (BMI = 18.5-22.99kg/m^2), Overweight (BMI = 23-24.99kg/m^2) and Obese (BMI = ≥25kg/m^2) according to the BMI classification given by the Steering Committee of the Regional office for Western Pacific Region of WHO, the International Association for Study of Obesity and the International Obesity Task Force proposed the appropriateness of the classification of obesity in Asia in 2000 (3). **Waist circumference** -The cut off point for central obesity was defined as ≥90cm for males & ≥80 cm for females as suggested for Asian ethnicity [(4)]. **Waist-hip Ratio** -The cut off point for truncal obesity was defined as ≥0.9 for males & ≥0.8 for females as suggested for Asian ethnicity(4).

Blood Pressure was classified into four stages: Normal (SBP <120 mmHg and DBP <80 mmHg respectively), Pre-hypertension (SBP=120-139 and/or DBP= 80-89 mmHg), stage I hypertension (SBP=140-159 and/ or DBP=90-99 mmHg) and stage II hypertension (SBP= ≥160 and /or ≥100 mmHg) as per US Seventh Joint National Committee on Detection, Evaluation & Treatment of Hypertension (JNC VII) criteria [(5)]. Individuals with history of hypertension and on antihypertensive treatment were also labeled as hypertensive.

Statistical Analysis: Data was compiled, entered & analyzed using Microsoft excel and SPSS version 20. The chi square test was used for evaluating statistical significance of association between those were hypertensive and those who were not. A two-tailed p value less than 0.05 was considered significant.

Results

369 participants aged 30 years and above attending OPD of RHTC of Department of community Medicine were included in the study and among these 52.04% were females. Majority of the participants were between 50-59 years of age (28.99%) and 96.21% belonged to Hindu community. Nearly three-fourth of respondents were from joint families (71.82 %) and 87% were married. One-fourth (24.9%) of the participants were illiterate, 30% had secondary level, 35% had higher secondary level and 10% had graduate or above level education respectively [Table 1]. Prevalence of Pre-hypertension and hypertension was 41.73% and 34.9% in study participants respectively. Among the hypertensive 13% were newly diagnosed cases. The more number of males (40.11%) were pre-hypertensive as compared to females (30.21%) whereas the proportion of hypertensive among males and females was almost same (male – 41.25% and females – 42.19%) [Table 2].

According to [table 3], Hypertension was found to be significantly associated with increasing age (χ^2=12.33), family history of hypertension (χ^2=6.68), mixed diet (χ^2=5.87), increased salt intake (χ^2=12.42), body mass index ≥23kg/m^2 (χ^2=19.75), increased waist circumference (χ^2=33.50) and increased waist hip ratio (χ^2=5.80). Association of hypertension was not found to be significant with sex, tobacco use, alcohol use and physical activity.

Discussion

In this study, prevalence of hypertension was 41.7% among patients attending the OPD situated in the rural area. Also, the two OPD based studies (7,16) done previously in the hilly region of Uttarakhand had low prevalence of hypertension than that found in present study. The prevalence of hypertension in other parts of rural India ranged from 11.43% to 43.3% as reported in several studies (6-20).The diverse geographical, cultural and socioeconomic characteristics of the people in this country itself may be some of the reasons for such wide range in prevalence of hypertension. Some variations in prevalence may be due to variations in methodology used in different studies such as difference in hypertension criteria and age groups included.

Hypertension was significantly associated with increase in age in our study and the finding was consistent with several studies (6-20).The prevalence of hypertension in this study was slightly higher among females compared to that in males but the difference was not statistically significant. Similar pattern, were seen in studies done by Parekh et al in Vadodara (14) and Mahmood et al in Bareilly (17). Kokiwar et al (12) observed female sex having higher prevalence of hypertension as compared to male and this difference was significant. In the present study, association of hypertension was statistically significant with family history of hypertension and increasing BMI and similar findings were observed in studies done by Rajasekar et al (13) Saxena et al (16) and Rao et al (20).

Increased waist circumference was significantly associated with hypertension and the same observation was reported by Rajasekar et al (13) and Rao et al (20).

Increased waist hip ratio was significantly associated with hypertension in this study and the similar observation was reported in study done in Central India (Nagpur) by Kokiwar et al (12).

Increased salt intake and consumption of mixed/ non-vegetarian diet was found to be significantly associated with hypertension in our study and similar observation was found in study by Gupta M et al (10). Association of increased salt intake and hypertension was also observed in studies done by Ghosh et al (6) and Saxena et al (16).

Physical inactivity was not found statistically associated with hypertension in this study and the similar findings was observed by Rajasekar et al (13) while the studies by Gupta SK et al (7) and Madhu et al (8) had a significant association between sedentary life style and hypertension.

In the present study no significant association was observed between hypertension and consumption of tobacco and alcohol whereas in studies done by Gupta SK et al (7), Rajasekar et al (13) and Saxena et al (16) tobacco smoking and alcohol consumption were significantly associated with hypertension. This may be because of variations in consumptions of tobacco and alcohol among males and females as none of the females in our study reported using tobacco and alcohol. Intake of alcohol was occasionally i.e. in months according to subjects.

Limitations: It was an OPD based study involving small sample size; results cannot be generalized to entire population. Overestimation of the prevalence of hypertension could be there because of white coat hypertension and the stress factor, which could not be evaluated.

Conclusion

In this study, the prevalence for hypertension in OPD attendees of RHTC was relatively high. The significant association was observed with various risk factors such as age, family history of hypertension, dietary habits, salt intake, and obesity. Except age and genetic predisposition other risk factors are modifiable. Thus extensive efforts directed towards raising the awareness level regarding lifestyle modifications would be helpful in reducing the burden of hypertension.

Recommendation

The routine screening of patients aged 30 years and above attending the hospitals and at the community level will facilitate early detection of hypertension and preventing the complications & chronic disability resulting from it.

Authors Contribution

JB - 1) Concept and design, acquisition of data, or analysis and interpretation of data; 2) drafting the article or revising it critically for important intellectual content; and 3) final approval of the version to be published. SA - 1) Concept and Design 2) interpretation of data; 3) drafting the article or revising it critically for important intellectual content; and 4) final approval of the version to be published. CMSR - 1) Concept & Design 2) Review of article 3) final approval of the version to be published. RKS- 1) Concept & Design 2) Interpretation of Data 3) Review of article 4) final approval of the version to be published.

References

1. Hypertension fact sheet, WHO Regional Office for South East Asia. [accessed on 2013,September 3]Available from http://www.searo.who.int/entity/noncommunicable_diseases/media/non_communicable_diseases_hypertension_fs.pdf.
2. Park K. Epidemiology of Chronic Non Communicable Diseases and Conditions. In Park's Text Book of Preventive and Social Medicine, 22nd ed. Jabalpur: Banarasidas Bhanot Publishers; 2013. p. 344-8.
3. WHO/IASO/IOTF. The Asia-Pacific perspective: redefining obesity and its treatment. Health Communications Australia: Melbourne.2000.
4. Waist Circumference and Waist Hip ratio. Report of a WHO Expert Consultation, Geneva, 8-11 Dec. 2008[accessed on 2013, September 14] Available from http://www.who.int/nutrition/publications.
5. 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: 2560–72.
6. Ghosh A, Sarkar D, Mukherji B, Pal R. Prevalence and risk correlates of hypertension among adult rural population in Bihar. Ann Trop Med Public Health 2013; 6:71-5. [Google Scholars]
7. Gupta SK, Dixit S, Singh AK, Nagaonkar S, Malik N. Prevalence and Predictors of Hypertension: A cross-sectional study among people coming to a tertiary health care facility in Garhwal-Uttarakhand. Indian J Community Health. 2012; 24 (4): 274-9. [Google Scholars]
8. Madhu B, Srinath KM, Ashok NC. Hypertension: Prevalence and its Associated Factors in a Rural South Indian Population. Indian J Public Health Res & Development 2012; 3(4): 105-9.
9. Bhardwaj SD, Sinha U, Shewte MK, Khadse JR, Bhatkule PR. Prevalence, Awareness, Treatment and Control of Hypertension among the people above 15 Years in rural area Nagpur Maharashtra - A Cross Sectional Study. Natl J Community Med 2012;3(2): 213-7.
10. Gupta M, Parashar P, Nath B, & Bansal R. An epidemiological study on hypertension and its dietary correlates in a rural population of meerut. Indian Journal of Community Health (IJCH), 2012;24(2):161-5. [Google Scholars]
11. Yuvaraj BY, NagendraGowda MR, and Umakantha AG. Prevalence, awareness, treatment, and control of hypertension in rural areas of davanagere. Indian J Community Med. 2010 Jan;35(1):138-41. doi: 10.4103/0970-0218.62578. PubMed PMID: 20606939; PubMed Central PMCID: PMC2888343. [PubMed]
12. Kokiwar PR, Gupta SS, Durge PM. Prevalence of hypertension in a rural community of central India. J Assoc Physicians India. 2012 Jun;60:26-9. PubMed PMID: 23409417. [PubMed]
13. Rajasekar VD, Krishnagopal L, Mittal A, Singh Z, Purty AJ, Binu VS. Prevalence and risk factors for Hypertension in a rural area of Tamil Nadu, South India. Indian J Med Specialties 2012; 3 (1): 12-7.
14. Parekh A, Parekh M, Vadasmiya D, Kumar A. Study of Prehypertension & Hypertension in rural area of Vadodara district. Int J Med Sci Public Health 2013; 2(1):117-20.
15. Mahmood SE, Bhardwaj P, Srivastava JP, Mathur KP, Zaidi ZH, Shaifali I. Sociodemographic risk factors of cardiovascular disease in rural Lucknow. Int. J. Med. Public Health 2012; 2 (1): 56-61. [Google Scholars]
16. Saxena P, Saxena V, Saxena Y. Bio-social Factors associated with Hypertension in Hilly population of Tehri Garhwal. Indian J Community Health. 2011; 23(2): 81-3. [Google Scholars]
17. Mahmood SE, Ansari SH. Prevalence of Prehypertension and Hypertension in rural Bareilly. Natl J Med Res. 2012; 2 (3): 291-4.
18. Bansal SK, Saxena V, Kandpal SD, Gray WK, Walker RW, Goel D. The prevalence of hypertension and hypertension risk factors in a rural Indian community: A prospective door-to-door study. J Cardiovasc Dis Res. 2012 Apr;3(2):117-23. doi: 10.4103/0975-3583.95365. PubMed PMID: 22629029; PubMed Central PMCID: PMC3354454. [PubMed]
19. Bhardwaj R, Kandori A, Marwah R, Vaidya P, Singh B, Dhiman P, Sharma A. Prevalence, awareness and control of hypertension in rural communities of Himachal Pradesh. J Assoc Physicians India. 2010 Jul;58:423-4, 429. PubMed PMID: 21121207. [PubMed]
20. Chythra R. Rao, Veena G. Kamath, Shetty A, Kamath A. High Blood Pressure Prevalence and Significant Correlates: A Quantitative Analysis from Coastal Karnataka, India. ISRN Preventive Medicine, 2013, Article ID 574973, 6 pages. doi:10.5402/2013/574973

--------------------------x--------------------------

Tables

TABLE NO. 1 DEMOGRAPHIC CHARACTERISTIC OF STUDY SUBJECTS

Characteristics of Study Subjects	Number (N=369)	(%)
Age group (years)		
30-39	83	22.49
40-49	102	27.64
50-59	107	28.99
≥60	77	20.88
Sex		
Male	177	47.96
Female	192	52.04
Religion		
Hindu	355	96.21
Muslim	04	1.08
Sikh	10	2.71
Family Type		
Joint	265	71.82
Nuclear	104	28.18

Marital Status		
Married	321	86.99
Unmarried	4	1.08
Widow/Widower	44	11.93
Educational Status		
Illiterate	92	24.93
Primary-Middle	111	30.08
High School-Intermediate	129	34.96
Graduate& above	37	10.03
Occupation		
Housewife	173	46.88
Farmer/ Unskilled labour	83	22.49
Skilled labour	35	9.49
Service/Business	63	17.07
Not working	15	4.07

TABLE NO. 2 DISTRIBUTION OF STUDY PARTICIPANTS ACCORDING TO THEIR BLOOD PRESSURE

Blood Pressure	Sex				Total	
	Males		Females			
	No.	%	No.	%	No.	%
Normal	33	18.64	53	27.60	86	23.31
Pre Hypertension	71	40.11	58	30.21	129	34.96
Hypertension Stage I	48	27.13	46	23.96	94	25.47
Hypertension Stage II	25	14.12	35	18.23	60	16.26
Total	177	100	192	100	369	100

TABLE NO. 3 ASSOCIATION BETWEEN HYPERTENSION AND RISK FACTORS

VARIABLES	HYPERTENSION		x^2
	PRESENT (N=154) (%)	ABSENT (N=215) (%)	
Age (years)			
30-39	22 (14.28)	61 (28.37)	
40-49	42(27.28)	60(27.91)	12.33*
50-59	50(32.47)	57(26.51)	
≥60	40(25.97)	37(17.21)	
Sex			
Male	73(47.40)	104(48.37)	0.03
Female	81(52.60)	111(51.63)	
Family H/o HTN			
Present	58(37.66)	54(25.12)	6.68*
Absent	96(62.34)	161(74.88)	
Salt intake			
Normal	75(48.70)	144 (66.98)	12.42*
Increased	79(51.30)	71 (33.02)	
Body Mass Index			
Normal	33(21.43)	94 (43.72)	19.75*
Overweight/obese	121 (78.57)	121 (56.28)	
Waist Circumference			
Normal	40 (25.97)	121 (56.28)	33.50*
Central obesity	114 (74.03)	94 (43.72)	
Waist Hip Ratio			
Normal	27(17.53)	61(28.37)	5.80*
Increased	127(82.47)	154(71.63)	
Physical Activity			
Present	52(33.77)	77(35.81)	0.16
Absent	102(66.23)	138(64.19)	
Tobacco use			
Present	33(21.43)	58(26.98)	1.48
Absent	121(78.57)	157(73.02)	
Alcohol use			

Present	35(22.73)	48(22.33)	0.00
Absent	119(77.27)	167(77.67)	
Dietary Habits			
Mixed	79(51.30)	83(38.60)	5.87*
Vegetarian	75(48.70)	132(61.40)	

*χ^2 is significant for $p<0.05$