

Prevalence and Risk Factors of Hypertension in Hansposa VDC of Sunsari District, Nepal.

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ABSTRACT

Introduction: Hypertension is defined as a systolic blood pressure (SBP) of 140 millimeter of mercury (mm of Hg) or more and a diastolic blood pressure (DBP) of 90 mm of Hg or more, or taking antihypertensive medication. Hypertension causes an increased work load on the heart and can cause damage to the blood vessels. The public awareness about hypertension in the villages of Nepal is low and no studies have been conducted earlier to elaborate the risk factors and prevalence of Hypertension in Hansposa village of Nepal. The aim of this study was to identify the prevalence of Hypertension and the risk factors associated with it in this village.

Methods: A cross sectional survey (study) was carried out from September 25, 2014 to October 25, 2014 in order to know the prevalence and risk factor(s) of hypertension among people of Hansposa Village Development Committee (VDC), Sunsari, Nepal. Data were collected from both sexes by asking demographic details, habits like alcohol intake, smoking, exercise and education and examination of blood pressure, weight and height. The association of hypertension with age, sex, education, tobacco, alcohol consumption and body mass index (BMI) were estimated according to WHO standard criteria.

Results: On analysis, the prevalence of hypertension was 37 % [95% CI=31-42(M: 55.1%; F: 26.7%)]. The prevalence of tobacco, alcohol consumption, and overweight/obesity was 31.3% (including past and present), 36.1%, and 31.9% respectively. Further analysis showed that there is significant association between hypertension and age, sex, alcohol consumption and physical inactivity ($P < 0.05$) i.e. there is increasing trend in the prevalence of hypertension with increasing age [χ^2 (chi square) for linear trend $P = 0.000$].

Conclusion: There is high prevalence of hypertension among people of Hansposa VDC; especially isolated diastolic blood pressure and is associated with age, sex, alcohol consumption and physical inactivity.

Keywords: *hypertension; isolated diastolic hypertension; obesity; overweight; alcohol; tobacco*

INTRODUCTION

Higher the blood pressure (BP) greater the risk of stroke and lower the life expectancy^{1,2,3}. Globally about 50% of the population is affected with hypertension¹ and prevalence will increase by 24% in developed and 80% in

developing countries by 2025⁴. Similarly, in low and middle income countries increased prevalence of hypertension has adverse

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economic impact⁵. Study of Car Nicobar Island of India showed prevalence of 50.5 percent². A study from India predicted two-fold rise in cardiovascular disease (CVD) death in 2020 compared to 1990⁶. Hypertension was found to be high in males, diabetic person, unaware population particularly in elderly, obese and alcoholics, smokers and those having high saturated fat and salt intake^{2-4,13-18}.

As reported by WHO, 27.8% of Nepalese adults aged 25 years and above are estimated to have Hypertension⁸. In Nepal, the prevalence of hypertension ranged from 18.8-41.8% with regional variation⁸. Similarly, the prevalence was 33.9% in Eastern and 22.4% in central region^{3,9}. Hansposa is a typical VDC of Nepal with mixed ethnicity and people from mountainous and Terai region live together. The public awareness about hypertension in this VDC is low and no studies have been conducted earlier to elaborate the risk factors and prevalence of Hypertension. The aim of this study was to identify the prevalence of Hypertension in Hansposa VDC and the risk factors associated with it.

METHODS

This cross sectional study was carried out in individuals aged over 25 years of Hansposa VDC. The sample size calculation was done according to the total population of the VDC (27,655) and people aged over 25 years (17,087)¹⁰ with 34% prevalence of hypertension in rural eastern Nepal⁸. Assuming a prevalence of 34 % and absolute precision of 5 % with 95 % confidence interval, the required sample size was estimated to be 338. The participants were selected from different wards as per their availability. Informed consent was taken from all the participants. Required information was taken using

structured questionnaire sheet including demographic details, risk factors, examination of blood pressure, height and weight. Blood pressure was measured using sphygmomanometer (DOCTOR, Japan). Three readings were taken over right arm in the sitting position with interval of at least three minute and third one was recorded. The same instrument was used throughout the survey. Weighing machine (KRUPS, DOCTOR BELI RAM & SONS, Delhi) was used to measure the weight throughout the study period. Height was measured by measuring tape. The weighing machine was standardized each day before starting the survey.

Standard diagnostic criteria for various risk factors and hypertension are described as follows: Body mass index- The adults were classified into different grades of nutritional status as per the international classification of adult into underweight, overweight, and obesity according to BMI proposed by WHO¹. (BMI < 18.50 kg/m² = underweight; BMI 18.50 to 24.99 = normal; BMI ≥ 25.0 to 29.99 = overweight; BMI ≥ 30 = obese). Hypertension - Individuals with systolic blood pressure (SBP) of ≥ 140 Mm of Hg and or diastolic pressure (DBP) of ≥ 90 Mm of Hg, those who were already diagnosed and are under medication were considered as hypertensive. (BP ≤ 120/80 mm of Hg = normal, BP > 120/80 but < 140/90mm of Hg = pre-hypertensive, BP ≥ 140/90 but < 160/100 mm of Hg = Stage1 hypertension, BP ≥ 160/100 mm of Hg = Stage 2 hypertension, SBP ≥ 160 but DBP < 90mmHg = isolated systolic hypertension, SBP < 140 but DBP ≥ 90 mm of Hg = isolated diastolic hypertension).

The data obtained were analyzed using the Statistical Package for Social Sciences (SPSS) software (Version 17.0). The overall prevalence of hypertension in relation to various other variables along with 95 per cent confidence interval (CI) was calculated. Bivariate analysis was carried out to find out associations between age, sex, educational status, tobacco consumption, alcohol consumption, BMI with hypertension. The increasing trend in the prevalence of hypertension with increasing age, sex, alcohol consumption and physical inactivity was analyzed by χ^2 for linear trend.

RESULTS

Among the 351 subjects assessed, 130 (37%) (95% CI 31-42) were classified as hypertensive. Of the latter, 85 had Stage 1 hypertension, 14 had Stage 2 hypertension, 10 had isolated systolic Hypertension, 21 had isolated diastolic Hypertension (table 1). Among the participants 340 (96.1%) have checked their BP previously and 101 of 351 (28.8%) were known case of hypertension due to a medical diagnosis by a doctor. Only 28 of 130 (21%) detected to be hypertensive were on regular treatment currently for hypertension while 24 used to do so previously but not now. However, the control was achieved in one person only.

There was high frequency of alcohol consumption (36.2%). There is strong correlation between increasing age, sex, alcohol consumption and physical inactivity and hypertension but with overweight/obesity, tobacco consumption and stress and risk of hypertension was found insignificant (table 2).

DISCUSSION

Present study has documented a high prevalence of hypertension (37%) and its determinants like overweight/obesity (31.9%),

Table 1: Classification of Blood Pressure (BP) in Mm of Hg. HTN: Hypertension

BP classification	Frequency	Percent
Less than or equal to 120/080 (Normal)	179	51.0
120/080 -139/089 (Pre-hypertension)	42	12.0
140/090 -159/099 (Stage 1 hypertension)	85	24.2
More than 160/100 (Stage 2 hypertension)	14	4.0
Isolated systolic HTN	10	2.8
Isolated diastolic HTN	21	6.0

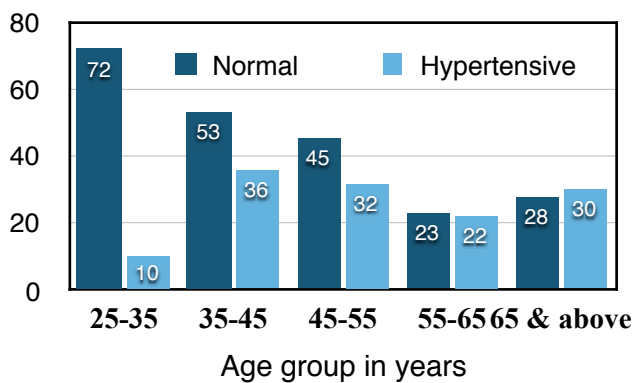


Figure 1: Correlation of hypertension with age.

tobacco smoking (31.3%) and alcohol consumption (36.2%), and illiteracy (47.3%) among the people of Hansposa which is comparable to the previous study of eastern Nepal which showed 33.9%⁸. The sex ratio of study subjects was 127:224 (Male: female=1:1.76) against the census figure (2070 B.S., Hansposa VDC Profile) of 1:1.01, this is due to males staying out of the village for work.

Table 2: Risk factors and their association with hypertension.

Risk factors		Normal BP (%)	Hypertensive (%)	Total (%)	p-value
Alcohol	Yes	65 (18.5)	62 (17.6)	127 (36.1)	0.000
	No	156 (44.4)	68 (19.3)	224 (63.8)	
Smoking	Yes	65 (18.5)	45 (12.8)	110 (31.3)	0.185
	No	156 (44.4)	85 (24.2)	241 (68.6)	
BMI	Supra-normal	64 (18.2)	48 (13.6)	112 (31.9)	0.077
	Normal	157 (44.7)	82 (23.3)	239 (68.0)	
Stressful condition	Yes	6 (1.7)	5 (1.4)	11 (3.1)	0.385
	No	215 (18.5)	125 (35.6)	340 (96.8)	
Adequate exercise	Yes	157 (44.7)	75 (21.3)	232 (66.0)	0.000
	No	46 (13.1)	55 (15.6)	101 (28.7)	
Education	Literate	126 (35.8)	59 (16.8)	185 (52.7)	0.023
	Illiterate	95 (27.0)	71 (20.2)	166 (47.2)	

Though the present study has highlighted on the unknown health problem of the community till the time, it is of preliminary nature with limitations. The lifestyle risk factors like diet, dietary salt, fibre, saturated fat, trans-fat among the Hansposa community were not estimated. It is well known that factors like dietary salt consumption can influence the BP independent of other risk factors^{2,11}. Also, though it was the target of the study to get the data of prevalence and risk factors from all 351 subjects whose BP was measured but it could not be achieved because of various socio-cultural beliefs and literacy of the community. All the adult members available in the house were investigated but those who had gone to work or out of the village (predominantly males) for employment opportunities were missed. This is reflected in over representation of older age group and female subjects in the study. But, the fact that prevalence of hypertension adjusted to community based screening for CVD risk

factor in Eastern Nepal, showing hypertension prevalence of 33.9% in 2011 proves that findings of present study was not affected by these limitations. Our aim was to choose an appropriate sample size for an expected prevalence of 34 percent with an absolute precision of 5 percent. Since most of the people living in Hansposa share almost same socio-cultural habit, this study has a generalizability value with regard to people living in Nepal. Another limitation was that the diagnosis was made only on three reading of blood pressure on same day and the incomplete follow up data.

It is increasingly been recognized that the poor, marginalized communities are facing the burden of non-communicable diseases in general and hypertension^{4,5} particular. Studies carried out among the Nepalese population have documented hypertension prevalence ranging from 18.8 percent to 41.8 percent⁸. The

WHO global health observatory 2013, has estimated 27.8% prevalence of hypertension in Nepalese population of aged 25 and above. In the present study the prevalence of hypertension among population of Hansposa was high. The prevalence documented in the present study is higher than that in Saudi Arabia⁴. The usage of alcohol and tobacco was high among population of Hansposa but only alcohol consumption shows positive correlation with hypertension ($p=0.000$). It has to be noted that majority consumed locally produced alcoholic beverages. Though the prevalence of overweight/obesity (31.9%) was also high among population of Hansposa correlation with hypertension was found insignificant ($p=0.077$). There is also strong correlation between age, sex and physical inactivity and hypertension.

CONCLUSION

The prevalence of hypertension in Hasposa VDC is 37% which is relatively high. Also there is significant association between risk factors namely age, sex, alcohol consumption, smoking, physical inactivity and illiteracy.

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