

# Incidence of Hypertension in the Nepalese Army Selected for United Nation's Mission

Devendra Khatri<sup>1</sup>, Ratna Khatri<sup>2</sup>, Binita Yadav<sup>3</sup>, Helina Rayamajhi<sup>4</sup>, Kishor Jung Rana<sup>1</sup>, Rajiv Pandey<sup>1</sup>.  
<sup>1</sup>Department of Internal Medicine, Shree Birendra Hospital; <sup>2</sup>Department of Gynaecology and Obstetrics, Shree Birendra Hospital; <sup>3</sup>Department of Accident and Emergency, Shree Birendra Hospital; <sup>4</sup>Dental Department, Shree Birendra Hospital.

## ABSTRACT

**Introduction:** Hypertension is an important public health challenge in the developing and the developed world alike. However, hospital-based studies on cardiovascular diseases including hypertension in a developing country like Nepal have been limited. The objective of the present study was to determine the incidence of hypertension in the troops selected for mission.

**Methods:** We did medical check-up of 850 soldiers selected for UNIFIL mission from January 2014 to March 2014 at Shree Birendra Hospital Chhauni, Kathmandu. Age ranged from 29 years to 55 years was included in the group. Various parameters like history of diabetes mellitus, hypertension, coronary artery disease, smoking, alcohol, family history, measurement of blood pressure, body mass index, lipid profile and number of people who has to take antihypertensive medicines were studied.

**Results:** Out of 850 military personnel 48 found to have high blood pressure. Maximum candidates belonged to young age group 29-35 years of age. 22 were overweight and 6 were obese and having higher blood pressure levels. 66% were habituated to alcohol intake minimum 60 ml up to 160 ml. Most of them were occasional drinker. 31 candidates constituting 64.58% had to be put on antihypertensive that were newly diagnosed. 3 persons had past history of hypertension and were already on antihypertensive.

**Conclusions:** The study highlights the prevalence of various risk factors for coronary artery disease in the army. Since majority of risk factors are modifiable, timely intervention can help in reducing morbidity and mortality.

**Keywords:** hypertension; coronary artery disease; body mass index; lipid profile; ECG.

## INTRODUCTION

Coronary artery disease (CAD) as a lifestyle disease is slowly growing importance in Nepal as a major cause of morbidity and mortality. Despite the fact that it is the developing world that is and will be facing the epidemic of hypertension (HT) and other chronic diseases, research on cardiovascular diseases in a developing country such as Nepal has been limited. There have been very few studies on the prevalence of

individual risk factors for CAD such as hypertension, obesity, etc. from Nepal; however, detailed assessment of multiple risk factors in the same community has not been done<sup>1</sup>.

High blood pressure is now growing as public health menace. One in every three individuals worldwide is hypertensive. Previously it was supposed to be the problem of elite, old, and western people. Now, astonishingly almost double the number of

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**Correspondence:**

Dr. Devendra Khatri  
Department of Internal Medicine, Shree Birendra Hospital;  
Email: drdbkhatri@yahoo.com

hypertensive people lives in developing countries like in developed countries. According to WHO, prevalence of high blood pressure is highest in some low- income countries in Africa where nearly has 100% of total adults are being affected. Even in Nepal, a recent study in rural Kathmandu showed that the prevalence of high blood pressure has been increased by three fold in 25 years. Surfeit of evidences suggest the development of inevitable worse scenario in Nepal in near future.

WHO estimated about 62% of cardiovascular disease and 49% of ischaemic heart disease burden world-wide. Hypertension is estimated to cause 7.1 million deaths annually accounting for 13% of all deaths globally. Overall 26.4% adult world population was estimated to have hypertension in the year 2000, a number that was projected to increase to 29.2% by 2025<sup>2</sup>.

There are several risk factors for developing blood-pressure. Family history of high blood-pressure advanced age and gender are some predetermined unalterable risk factors for high blood pressure. However, the main concerning culprits for developing high blood pressure are some modifiable risk factors like lack of physical activity, overweight, poor diet with excessive salt intake, harmful use of alcohol and tobacco consumption and stressful life.

The main objective of this study was to estimate the incidence of arterial hypertension in the small group of military population and the associated factors for the hypertension.

## METHODS

This is a cross -sectional study. A face to face interview survey method using structured questionnaire was adopted for this survey.

Blood pressure was measured with a mercury sphygmomanometer. Two measurements of the blood pressure were taken on both the arm in the sitting-position. If found to have high blood pressure during medical check-up, after giving rest for half an hour the blood pressure was again measured, if ,found to be high these individuals were referred to the physician. After the investigations those individuals who were diagnosed as hypertensive by the physicians were included in this study.

This study was conducted from January 2014 to March

2014 in UNIFIL Mission. The population selected were soldiers deployed in UNIFIL mission. The total number of soldiers was 850. The patients were selected from OPD card and according to diagnosis (isolated hypertension) by the Doctor.

Patients having associated disease like Heart disease, Kidney disease, Diabetes etc.were excluded.Age distribution of the respondent included age ranged from 29yrs to 53 yrs. All the respondents belonged to almost same economic background. The education wise mostly have acquired till the primary standard education.

PSS 11.5 version software was used to analyse the data. First distribution in the form of frequencies and the percentages, and measures of central tendency for all independent variable was reviewed. Chi-square test was done to compare the percentages of hypertensive respondents who were obese habituated to smoking and alcohol with who were not habituated to it and p-value <0.05 was considered as significant.

## RESULTS

During the medical check-up 850 soldiers were examined and out of that 48 personals were found to have high blood pressure that constitute only 5.64% of total population.

Nearly all of the cases of high blood pressure (98%) indicated the least immediate (“routine”) category of medical referral (ie., DIAS= 90-104 mm of Hg and/or SYS= 140-199mm of Hg). Only 2% required immediate referral that had blood pressure ranging 220-200/110-130mm of Hg.

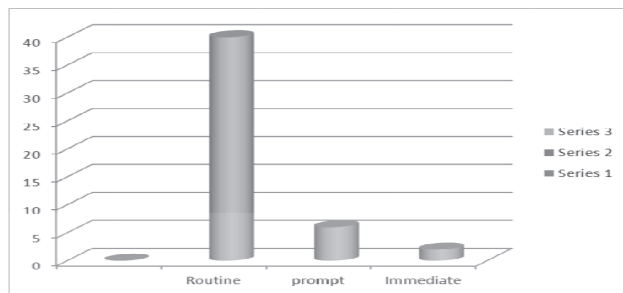
<b>Routine-</b>	SYS 140-199mm of Hg DIAS 90-104mm of Hg
<b>Prompt –</b>	SYS->200mm of Hg DIAS-105-114mm of Hg
<b>Immediate-</b>	>220mm of Hg DIAS->115mm of Hg

The majority of the participants were married with income of upto 150000 Nepalese Rupee per year and belonged to all ranks. These individuals had been working at the military unit for more than five years.

The largest proportion of the individuals(27) was in the age group 26yrs-35yrs. To our surprise majority of population with high blood pressure was observed in young military personals. Between 36-45yrs there were persons and only 5 soldiers that constituted 11%

in the elderly group that is 46yrs-55yrs. respondents.

**Figure 1.** Types of Referral Indicated



Nutritional status, described by the Body Mass Index (BMI) ( $\text{weight}/\text{height}^2$ ), was classified according to the proposal of the World Health Organization ( $25\text{kg}/\text{m}^2$ =eutrophic,  $25\text{-}29\text{kg}/\text{m}^2$ =overweight,  $>29\text{kg}/\text{m}^2$ =obesity).

So, as for nutritional status, prevalence of the overweight individuals were 22 that constitute 45% and 12% were obese rest 20 were eutrophic.

Prevalence of arterial hypertension tended to increase as the BMI increased. Overweight and obese individuals presented the severity of hypertension and need of anti-hypertensive prevalence, respectively, 75% and 178% higher than the eutrophic individuals. When compared to overweight individuals, hypertension prevalence was 78% higher among the obese.

Duration of Hypertension shows that majority of the respondents were newly diagnosed to have hypertension that were 45 in number among this 31 required antihypertensive that constituted 64.58% of total of 48 respondents. Fourteen persons (29.16%) didn't require medicines. Three individuals had past history of hypertension and were on regular medication.

In this study only 42% have familial history of hypertension either to mother, father or siblings.

Only 10 individuals that are 20% of the population were found to be habituated to smoking out of 48 hypertensive individuals. The number of cigarettes smoked minimum 1 stick/day maximum upto 6 sticks/day for 5-6 yrs. 32 out of 48 respondents consumed alcohol. That accounts 66% of total population of the study group. Among them 50% of the users consumed daily alcohol 60-90ml. and 35% were having 60-160ml twice a week and rest were occasional consumers. Laboratory investigations showed that prevalence of

hypertriglyceridemia and hypercholesterolemia were found only in 6 cases that accounts total of 12% only.

All the personal were subjected for Electrocardiogram and ECHO investigations. Five people had abnormal ECG and 8 of them found to have some abnormalities in ECHO. Two people had valvular heart disease, had left ventricular diastolic dysfunction and one of them had thick interventricular septum.

## DISCUSSION

Some aspects must be taken into account in the results interpretation. The first refers to the fact that the study was carried out at only one military unit, limiting the extrapolation of the results. Another aspect concerns the cross-sectional outline of the study, which do not ensure the temporal precedence of the anthropometric indexes over the occurrence of arterial hypertension, but there is scientific plausibility in this order. Also, the fact that many of the military personnel may not have given the correct history which may prevented us from obtaining exact data to find out the incidence. But as the sample was composed of military personnel from all ranks, and all the parameters obtained by direct measurement and not by self-report so result interpretation is not affected.

It is known that more than 95% of hypertensive patients in the community are of essential or idiopathic/unknown aetiology and only a small percentage have an identifiable cause (secondary hypertension).

The result of this study indicates that approximately 5.64% of active military personal had elevated blood pressure during their medical check-up for UNIFIL mission. Out of 48 military personal 42 of them didn't know they had high blood pressure in the past. If they had not come for the check-up then they might have lots of complication morbidity and sudden unexplained mortality in coming days. This study is quite close to the 9.4% estimate presented by Cohen and Curley<sup>2</sup> (1986) and indicates that approximately 54,000 Navy active duty personnel have uncontrolled high blood pressure. There was another study done on the prevalence of Hypertension among Active Duty Navy Personnel by D. Stephen Nice and Linda Kelly Trent<sup>3</sup> in 1989 which indicate that approximately 8.9% of active duty Navy personnel had elevated blood pressure during their annual blood pressure screen. Although the study was designed to capture confirmatory medical diagnostic data on individuals whose blood pressure was elevated

during medical check-up, inadequate compliance with referral and feedback procedures precluded this aspect of the study.

Overall, the rates of hypertension among active duty military personnel in this study were considerably lower than the age adjusted rates reported for the nation. Although few studies have been conducted on prevalence of individual risk factors of CAD in Nepal, there is relative paucity of study of multiple risk factors in the same population in Nepal. In a population-based study done in Dharan municipality involving 1000 males aged 35 years and above, the prevalence of hypertension was found to be 22.7%. The prevalence of hypertension in India and Pakistan is also similar to the study done at Dharan that is 22% and 30% respectively<sup>4-10</sup>.

A population-based cross-sectional study was done in Bardibas village area of Kathmandu valley to estimate the prevalence of HTN and the findings were compared to the study done in the same location 25 years ago. This study was conducted by Dr. Abhinav Yadav, Ram Prasad Pathak and Dr. Mrigendra Raj Pandey from March-April 2012<sup>11</sup>. Their findings showed that there has been a three-fold increment in the prevalence of HTN in the same location. The major cause behind this increment appears to be increased salt intake and increased body mass index. This study supports our findings.

Another study conducted and published in the journal of the American board of family medicine in 2008 showed 13% of the 15,391 subjects met the study definition for hypertension; 62% met the study definition for prehypertension. Contrary to our study increasing age and body mass index, male sex, black race/ ethnicity, and senior rank were associated with prehypertension<sup>1</sup>.

In the United States, the prevalence was 7% in individuals aged 18-39 years, in 2000. In a study conducted in a city in Korea, in 2001, the general prevalence was 33%, progressively increasing with age, from 14% between 18-24 years of age to 71% for people aged 75 years or older. In other countries, researchers found higher prevalence compared to the present one: in China, in 1998, it was 24% among men aged 35-59 years, and in Portugal, in 2003, prevalence

in adults aged 20-90 years was 42%, being 26% among aged 20-35 years<sup>7</sup>.

In a recently published national survey for risk factors of non-communicable disorders, the prevalence of diabetes, hypertension, obesity, and central obesity was reported to be 8.7%, 26.6%, 22.3% and 53.6% respectively<sup>6</sup>.

Body weight was another relevant factor in relation to arterial hypertension. It clearly observed that higher BMI, proportionately higher was the percentage of BP and lower values of BMI was associated with blood pressure. Thus, it was possible to observe a strong trend towards the increase in hypertension prevalence with the increase in BMI.

Another study (WHO, 2006) also showed that there is an inverse relationship between an aerobic physical activities and blood pressure. Regular aerobic physical activity has been demonstrated to be beneficial both for prevention and treatment of hypertension. There are 12 candidates having high triglycerides levels. This figure shows the relation with BMI that higher the BMI higher the chances of raised TG level. Similarly candidates having high triglyceride levels come in the category of either overweight or obese individuals in this study.

A study (WHO < 2006) observed a consistent association between alcohol intake and high blood pressure. There was statistically significant difference in consumption of alcohol before and after diagnosis of hypertension. Most of the respondents were habituated to alcohol intake that had high blood pressure. Regarding the habit of smoking it was observed that the difference between hypertension prevalence in smokers and in ex-smokers is not significant. Very few individuals were found to be habituated to smoking. In addition, it is possible to suppose that the decision to stop or not smoking may be connected with medical recommendations.

## CONCLUSIONS

The prevalence of arterial hypertension is high among the studied military personnel. Being habituated to alcohol intake and higher BMI proved to be a risk situation for arterial hypertension.

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