Abstract

Objectives: We conducted the present study to assess the prevalence of hypertension, prehypertension, normotension and the associated factors along with awareness, treatment and control of hypertension among police personnel in Bankura, West Bengal, India.

Methods: We collected information on individual, lifestyle, service-related and anthropometric characteristics of 1817 police personnel. We also measured blood pressure (BP) and plasma glucose level of the participants. Individuals were classified as hypertensive (BP ≥ 140/90 mmHg), prehypertensive (BP 120-139/80-89 mmHg) and normotensive (BP < 120/80 mmHg) on the basis of BP and their prevalence were expressed in percentages. Relation of individual, lifestyle, service-related and anthropometric characteristics with hypertension and/or prehypertension was examined with binary logistic regression.

Results: Prevalence of hypertension, prehypertension and normotension are 41.9%, 42.9% and 15.2% respectively. Even one-quarter of below 40 years subjects have hypertension. Mean BP remains in the prehypertensive range. Prevalence of hypertension and mean BP increases with age. Cardiovascular risk factors show clustering in higher age and with hypertension. Older age group, male gender, abdominal obesity, diabetes and service length are positively associated with hypertension and/or prehypertension. Around 40% of hypertensive knew their status, three-quarter of aware subjects received treatment and only one-third of treated subjects have controlled BP (< 140/90 mmHg).

Conclusion: High prevalence of hypertension and prehypertension, high mean BP, mean age above 40 years and clustering of other risk factors pose a greater risk of cardiovascular morbidity in the current study population.

Introduction

Hypertension is an emerging public health problem due to its high prevalence and association with cardiovascular and overall morbidity and mortality. A recent estimate indicates that more than 25% of the world’s adult population i.e. one billion had hypertension in 2000 which is likely to increase to almost 30% - 1.56 billion by 2025. This higher prevalence of hypertension contributes to the current pandemic of cardiovascular diseases which accounts for almost 30% of all deaths globally.

This analysis also reports that hypertension is greater population burden in economically developing rather than developed countries. In India, around one-fifth of its population had hypertension in 2000 which is likely to increase by another 2-3% in 2025. In the INTERHEART and INTERSTROKE study, hypertension accounts for 17.9% and 34.6% population attributable risk for coronary artery diseases and stroke respectively.

Considering the physical and psychological stress related to law enforcement; elevated blood pressure poses a number of clinical and public health challenges. Sudden burst of stressfull and potentially life threatening activities in the context of long stretches of
After 110 mmHg. In a prospective study it is noted that major cardiovascular diseases, although the risk increases after 110 mmHg. In a prospective study it is noted that majority of incident cardiovascular disease events occur in persons who were prehypertensive or mildly hypertensive on diagnosis. So far, the focus of clinicians and epidemiologists has been on individuals with hypertension. However, evidence suggests that an increase by 10 mmHg above 120 mmHg is associated with 10% greater risk of cardiovascular events. Such an event may jeopardise safety and security of the person, co-workers and that of common people.

So far, the focus of clinicians and epidemiologists has been on individuals with hypertension. However, evidence suggests that an increase by 10 mmHg above 120 mmHg is associated with 10% greater risk of cardiovascular diseases, although the risk increases after 110 mmHg. In a prospective study it is noted that majority of incident cardiovascular disease events occur in persons who were prehypertensive or mildly hypertensive on diagnosis.

So, prevalence of prehypertension is equally important to know as that of hypertension. Distribution of blood pressure of the entire population gives the cues for appropriate intervention strategies and more so among law enforcers.

In this context the present study was conducted to estimate the prevalence of hypertension, prehypertension, normotension, to identify the associated factors with hypertension and high BP (hypertension and prehypertension together) and to note the awareness, treatment and control of hypertension among police personnel in Bankura, West Bengal.

Material and Methods

Ethical approval: Institutional Ethics Committee, B.S. Medical College, Bankura approved the study.

Study setting and epidemiological method used: We conducted a cross-sectional survey among all police personnel of Bankura district of West Bengal during July-November 2011. We in co-operation with the concerned authority arranged 19 camps to cover all the police personnel of 78 units of Bankura districts (23 Thana, 23 Phanri and 32 other units) on pre-defined dates.

Tools, technique and method of data collection

Rank and length of the services of the participants were collected through review of records. We took written informed consent from the study subjects prior to obtaining the information about age in completed years, gender, duration of formal education, regular physical activity, use of tobacco and history of known hypertension. Moderate intensity physical activity like marching, brisk walking, cycling etc. for more than 30 minutes a day and for at least 5 days in a week was taken as regular physical activity. We considered a person as a current user of tobacco if he/ she used tobacco in any form during last 30 days prior to survey. Body weight (to the nearest 0.5 kg) and height (to the nearest 0.5 cm) were measured in the standing motionless position with the bathroom scale and anthropometer rod, without shoes and in minimal clothing. Waist circumference was measured horizontally around the midpoint between iliac crest and lower rib cage by flexible, metal, non-stretchable measuring tape, in the standing position. BMI of 23-24.99 kg/m² and ≥ 25 kg/m² for both sexes were used to determine overweight and obesity. Waist circumference 90 cm in male and 80 cm in female were considered as cut off point for diagnosing abdominal obesity. We measured blood pressure on right arm of the participants by mercury sphygmomanometer in sitting position after 5 minutes rest. An average of three readings measured at an interval of 5 minutes was taken. Systolic BP ≥ 140 mmHg and/or diastolic BP ≥ 90 mmHg was regarded as the criteria for hypertension. Subjects on anti-hypertensive treatment were also considered as hypertensive for this study. Systolic BP 120-139 mmHg and/or diastolic BP 80-89 mmHg was regarded as prehypertension whereas systolic BP < 120 mmHg and diastolic BP < 80 mmHg was considered as normotension. Blood samples with sodium fluoride for fasting and two hour post 75 gm glucose load blood glucose was collected by venepuncture and was estimated by Glucose oxidase peroxidase method by XL 300 (Trans Asia) machine. We used World Health Organisation criteria to define diabetes mellitus (DM), impaired fasting glucose (IFG) and impaired glucose tolerance (IGT). IFG and IGT were collectively considered as pre-diabetes condition.

Data analysis

Prevalence of hypertension, prehypertension and normotension were expressed in percentages. Mean and standard deviation (SD) were used to describe systolic and diastolic BP and other continuous independent variables. To identify the correlates, binary logistic regression analysis was performed with presence or absence of hypertension and high BP (hypertension and prehypertension together) as dependent variables and socio-demographic and individual variables as independent categorical variables.

Results

Background information

A total of 1817 police personnel working in different police station/outposts in Bankura district participated in the study. 85 remained absent due to various reasons. The mean age of the study population was 42.3 ± 11.3 years with 50% aged over 43 years. Average duration of police services is 17.6 ± 10.6 years with nearly 70% have more than 10 years. Among the participants, majority are constables (72.8%) followed by Assistant Sub-Inspectors (14.3%), Sub-Inspectors (9.1%) and Inspectors (1.0%). Study population was male dominated (96.3%).
Distribution of blood pressure (BP)

Among the study population 41.9% had been suffering from hypertension and another 42.9% had blood pressure in the range of prehypertension. Even in age group of below 40 years, only one in four had normotension which became less than one in ten in above 40 years population.

Figure 1 showed that with increase in age, the prevalence of hypertension was increasing whereas there was decline in prevalence of normotension and prehypertension (chi square for linear trend = 206.36; p < 0.001).

Steady increase in mean systolic and diastolic blood pressure across the age group was seen in Table 1. The average systolic and diastolic BP of the study population remained in the grade of prehypertension and means were greater than medians (128.5 vs. 126.0 mmHg and 83.7 vs. 82.0 mmHg).

Prevalence of risk factors

Proportion of study population in the age groups of below 40 years, 40-49 years as well as 50 years and above were 41.9%, 23.2% and 34.8% respectively. As per revised criteria for Indian population, 16.7% of the police personnel had normal BMI, 25.7% were overweight and 57.6% were obese. According to waist circumference, 62.1% had abdominal obesity. 45.0% used tobacco regularly in any form including 26.7% current smoker. Nearly one-sixth (15.0%) had diabetes and another 6.9% had either impaired fasting glucose or impaired glucose tolerance. Only one-tenth (10.8%) were involved in regular physical exercise. We had also determined clustering of major modifiable risk factors of cardiovascular diseases- abdominal obesity, diabetes mellitus, use of tobacco and physical inactivity in relation to different grades of BP. Figure 2 reveals that clustering of two or more risk factors is noted in only one-quarter of normotensive subjects, which is almost one-third and half in pre-hypertensive and hypertensive subjects. The association between different grades of hypertension and clustering of risk factors showed linear trend (chi square for linear trend=11.12; p < 0.0001).

On further analysis, we found correlation of number of risk factors present with systolic (rho = 0.220, P < 0.001), diastolic BP (rho = 0.199, P < 0.001) and age (rho = 0.424, P < 0.001). Age was also found to be correlated with systolic (rho = 0.391, P < 0.001) and diastolic BP (rho = 0.294, P < 0.001).

Table 2 shows that age of 40-49 years, 50 years or more, male gender, service length of 10 years or more, abdominal obesity and diabetes were positively associated with hypertension. Similarly age of 50 years or more, male gender, service length of 10 years or more, physical inactivity and diabetes were positively associated with high blood pressure (prehypertension and hypertension combined).

Awareness, Treatment and Control of Hypertension

Figure 3 shows that nearly 60% of hypertensive police personnel were unaware about their disease. Majority of aware hypertensives (73.1%) received treatment but only one-third of them had controlled BP.

Discussion

Prevalence of hypertension among police personnel in Bankura was higher than national estimates as well as those noted in other epidemiological studies across India.1,12,13 Almost 85% of study population

Fig. 1 : Age-group wise distribution of different grades of blood pressure among study population (N = 1817)

Table 1 : Age-group wise distribution of systolic and diastolic blood pressure among study population (N = 1817)

<table>
<thead>
<tr>
<th>Age group</th>
<th>n</th>
<th>Systolic blood pressure Mean (± SD)</th>
<th>Diastolic blood pressure Mean (± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 40 years</td>
<td>762</td>
<td>121.7 ± 13.2</td>
<td>80.7 ± 8.9</td>
</tr>
<tr>
<td>40-49 years</td>
<td>422</td>
<td>130.5 ± 16.6</td>
<td>85.6 ± 10.0</td>
</tr>
<tr>
<td>≥ 50 years</td>
<td>633</td>
<td>135.3 ± 16.3</td>
<td>86.0 ± 10.2</td>
</tr>
<tr>
<td>Total</td>
<td>1817</td>
<td>128.5 ± 16.1</td>
<td>83.7 ± 9.9</td>
</tr>
</tbody>
</table>

Fig. 2 : Clustering of cardiovascular risk factors among study population with different grades of blood pressure (N = 1817)
had high BP i.e. hypertension/ prehypertension. Even in below 40 years age group about one-quarter had been suffering from hypertension and another half from prehypertension. As expected, prevalence of hypertension increased with age whereas that of normotension declined. Mean systolic and diastolic BP were in the prehypertension grade and their distribution was skewed to right. Scientific literatures report that approximately three quarters of emergency responders e.g. police officers and firefighters were overweight/ obese by BMI criteria. Studies report that around three-quarter of police officers and fire fighters were overweight/ obese by BMI criteria. Mean systolic blood pressure is also noted in prehypertensive cardiovascular health status of police personnel. Lack of regular physical exercise makes hypertension situation worse through increased prevalence of obesity and cardiovascular diseases. Risk of cardiovascular events increases many a fold when subjects with physical inactivity encounter sudden stressful situation requiring high cardiovascular demand.

Factors contributing to hypertension might also be associated with diabetes mellitus complicating the cardiovascular health status of police personnel. Lack of regular physical exercise makes hypertension situation worse through increased prevalence of obesity and cardiovascular diseases. Risk of cardiovascular events increases many a fold when subjects with physical inactivity encounter sudden stressful situation requiring high cardiovascular demand.

Awareness, treatment and control of hypertension among police personnel are not at all encouraging. The picture is comparable with that reported in urban population of Chennai, but better than many other community based studies in India. Awareness and control as reported by Gupta et al in a cross-national study are found to be better.

Astonishingly, two-third
of those who report to take anti-hypertensive medicine in the present study have uncontrolled BP. Studies have shown independent and strong association of hypertension with cardiovascular events in police officers and firefighters.5,6 Evidence also suggests that hypertension related risk of cardiovascular diseases are concentrated among individuals with uncontrolled hypertension and more so among emergency responders.5,7

High mean systolic and diastolic blood pressure with mean age of above 40 years along with clustering of a number of modifiable risk factors in the study population pose a greater risk of cardiovascular morbidity. This study may be considered as one of the initial steps to prevent progression of prehypertension to hypertension, protect health and wellbeing among hypertensives and promote healthy lifestyle among police personnel in Bankura.

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References


