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A STUDY OF PREVALENCE OF HYPERTENSION AMONG BUS DRIVERS IN BANGALORE CITY

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ABSTRACT

Background: Growing evidence suggests that hypertension is an important public health problem worldwide that constitutes the basis for the cardiovascular disease epidemic. Hypertension has become significant major health problem because of the major changes in the lifestyles, aging population, urbanization and socioeconomic changes. The percentage increases when selected occupational groups are screened. Transport drivers are one such group of people who are at risk of developing hypertension due to nature of their profession. The related impacts are not only harmful for driver's health, but also may endanger others. Very few studies in this regard prompted to take up the present study.

Objectives: To study the prevalence of hypertension among the city bus drivers and study its association with certain risk factors.

Methods: A structured personal interview using questionnaire and physical examination which includes height weight and blood pressure recordings were done in 500 bus drivers who were enrolled to this cross sectional study

Results: The prevalence of hypertension among the bus drivers was 16% (80/500). A significant positive correlation was seen between hypertension and increasing age, tobacco chewing and BMI. However, in this study hypertension was not found to be significantly associated with smoking, alcohol consumption, diet and salt intake.

Conclusion: Considering the high prevalence of hypertension in bus drivers and its association with risk factors, necessary education programme to raise the awareness has to be conducted. The findings of this study should be reconfirmed by other large scale studies to identify the role of known and unknown factors in hypertension in this community.

Keywords : Prevalence, Hypertension, Bus drivers

INTRODUCTION

India, the world's largest democracy, is undergoing a rapid economic growth accompanied by demographic, lifestyle and cultural changes.¹ For a developing nation as India which is in a socio-economic and epidemiological transition, hypertension a common cardiovascular disorder, poses a major public health challenge as hypertension is one of the major risk factors for cardiovascular

mortality, accounting for about 20-50% of all deaths.² The percentages of hypertensive's increase more when selected occupational groups are screened. Transport drivers are one such group of people who are at the risk of developing hypertension due to nature of their profession.

In the 1960s, Morris and his colleagues reported that the incidence of coronary heart disease among London bus drivers was almost twice that of bus conductors.³ These findings are supported

by a more recent prospective study in Copenhagen that reported higher heart disease mortality among bus drivers when compared with the general population.⁴ Several cross sectional designs suggest that driving a bus in a modern urban transit system may carry increased health risk. There has been a spurt in the vehicle population in cities due to opening of the Indian economy adding woes to the bus drivers causing high levels of stress and fatigue. The possibility of increased health risk associated with the bus driving is of importance not only to the health and safety of drivers in urban transit systems, but to the vast public that interacts with these systems.

Screening of hypertension will help to detect the risk factor early and will help to control better, if counseling and treatment are instituted early. Because many factors associated with the disease cannot be modified, emphasis should be given to those risk factors that are amenable to intervention.

Thus, there is an ideal opportunity to screen the baseline health status of drivers to detect the risk factors for hypertension early and to help control better. Very few studies have been undertaken in this population group in India. With this background, the present study was taken up among bus drivers to study the prevalence of hypertension and some risk factors associated with hypertension in Bangalore city.

MATERIAL AND METHODS

This study is a cross-sectional, conducted for a period of 1 year in 2003. Before initiating the study, a pilot study was conducted among 50 drivers. 44% of the bus drivers were found to be hypertensive. Based on the prevalence, the sample size was calculated at 5% significance level and 10% allowable error. To calculate the sample size the following formula was used, The sample size was 489, rounded up to 500. The sample size selected was systematically done by stages where 5 depots were selected in the first

stage among 23 depots by using systematic cyclic random sampling method. Subjects were selected proportionate to driver's strength in the selected depots to get 500 units by using simple random sampling method.

The study subjects included were 500 male bus drivers aged 30 years and above with a minimum of 5 years experience as bus drivers that exclusively work in Bangalore city. Demographic and anthropometric data including height, weight, and blood pressure were recorded by a structured personal interview using questionnaire.

Measurement of blood pressure

Hypertension is defined as diastolic blood pressure greater than 140mmHg and systolic blood pressure greater than 90mmHg. Blood pressure was measured following a five minute resting period in a sitting position on the right hand repeated two times with at least five-minute interval. The first and the fifth Korotkoff sounds were recorded as systolic and diastolic blood pressures. The mean value was taken in to consideration as the blood pressure value of the study.

Data Analysis

Chi-Square test of significance was used to test the association between hypertension and various risk factors.

RESULTS

All the study subjects were exclusively male (as it is common for professional drivers in India). 226(45%) out of 500 drivers were in 40-49 year age group followed by 217(43%) and 57(17%) in 30-39 and ≥ 50 years age group respectively. 233(47%) of the bus drivers had the high school education, whereas 24(5%) had pre-university and above.

In the present study, out of 500 drivers, the prevalence of hypertension was found in 16% (80) (table 1, figure1).

In the drivers, hypertension was found in 21(26%) participants between 30-39 years,

42(53%) participants between 40-49 years and 17(21%) participants in 50 years or more ($\chi^2 = 15.683$; $DF=2$; $P < 0.001$) (table2). 72(15%) non tobacco chewers were hypertensives, 8%(38) tobacco chewers were hypertensives ($\chi^2 = 7.963$; $DF=1$; $P < 0.01$) (Table3). Out of 161 who consumed alcohol, 33(41%) were hypertensives; out of 339 who did not consume alcohol, 47(59%) were hypertensives (Table3). The findings of the study revealed no association between hypertension and extra salt intake ($P=0.583$) (Table3). Hypertension was found in 48(60%) who were nonsmokers and in 32(40%) drivers who were smokers ($\chi^2=0.320$; $DF=1$; $P > 0.05$) (Table3). The prevalence of hypertension is high 73(91%) among the drivers who were consuming mixed diet as compared to vegetarians 7(9%) ($\chi^2 = 0.344$; $DF=1$; $P > 0.05$) but statistically was not significant (Table3). The observed differences were not statistically significant in drivers who consumed alcohol, smoked, and consumed extra salt (Table3). Among the study population, 34 were obese (30-35). Out of 34 obese drivers, 12(15%) were hypertensives ($\chi^2 = 12.068$; $DF=1$; $P < 0.05$). The observed differences were found to be statistically significant (Table4).

DISCUSSION

The prevalence of hypertension among bus drivers was 16% (80/500). In other words more than one out of every 10 person had hypertension. In this study, the various risk factors that were associated with hypertension are increasing age, habit of tobacco chewing, increased body mass index.

According to NHANES-III, the prevalence and severity of hypertension increases substantially with advancing age across the full human lifespan;⁵ High association of hypertension with tobacco chewing habits is supported by a study by Nanda and Sharma *et al* which noted increase in heart rate and blood pressure following

tobacco chewing supporting the result of this study.⁶

Our study demonstrated significant correlation between hypertension and obesity. National cohort study in United States found BMI was a risk factor for hypertension.⁷ Evans County Georgia (1991) indicated that those obese are at 6 times higher of becoming hypertensives.⁸ B. S. Deswal *et al* reported that the relative risk of developing hypertension among obese subjects was found to be 5.25 times more as compared to non-obese persons which is highly significant ($P < 0.001$).⁹ Multivariate regressions of blood pressure from observational data show a rise of 2-3mmHg systolic blood pressure and 1-3mmHg diastolic blood pressure for each 10kg increase in weight.¹⁰

Though observational studies like Swain *et al*¹¹ and Sciarrone *et al*,¹² have consistently demonstrated a positive relationship between low blood pressure and vegetarian diet, our study failed to demonstrate any kind of association of hypertension with the vegetarian or mixed diet. Previous study, Malhotra *et al* found no difference in association of hypertension between people who consumed alcohol compared to who did not.¹³ Our study demonstrated that the association of alcohol and developing hypertension was not significant.

Baldwa *et al* demonstrated that higher salt intake is a precipitating factor for developing hypertension.¹⁴ Inter-salt study, resulted that 100mmol per day of salt intake over a long time results in 9mmHg rise in systolic hypertension.¹⁵ However, in our study Fischer's exact probability test, $P=0.583$ demonstrated no association between salt intake and hypertension.

CONCLUSION

These findings support the previous international studies on bus drivers suggesting that the prevalence of hypertension was high and exposure to occupation of driving bus increase the health risk.

The most important goal of implementing this preliminary study was to perceive the probable application of comprehensive approach to improve the care of hypertension in the community. There is a need for periodic examination to be followed once in three months. Health education measures are recommended to raise the awareness among bus drivers about the risk factors, complications, prevention and control of hypertension focusing more on modifiable risk factors and consequences of high blood pressure. It is suggested that the findings and recommendations of this study be reconfirmed by large scale studies.

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Table I. Prevalence rates for hypertension

Status	Number
Normotensive	420(84%)
Hypertensive	80(16%)

Table II. Prevalence rates for hypertension by age*

Age(in years)	Hypertensive % (n)
30-39	26% (21/196)
40-49	53% (42/184)
≥ 50	21% (17/40)

($\chi^2 = 15.683$; DF=2; P<0.001)

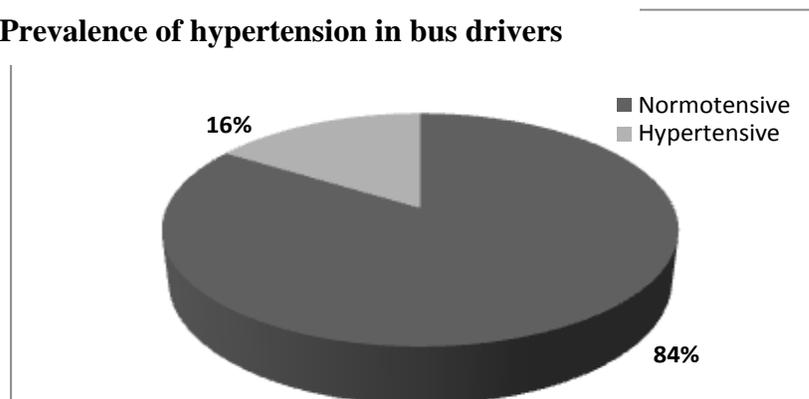
Table III. Distribution of hypertension according to various risk factors

		Normotensive	Hypertensive	Total	
Tobacco chewing	No	407(85%)	72 (15%)	479	$\chi^2 = 7.963$; DF=1; P< 0.01
	Yes	13(62%)	8 (38%)	21	
Alcohol consumption	No	292(70%)	47(59%)	339	$\chi^2 = 3.573$; DF=1; P> 0.01
	Yes	128(30%)	33(41%)	161	
Salt Intake	No	416(99%)	79(99%)	447	P=0.583
	Yes	04(01%)	01(01%)	53	
Smoking Habit	No	266(63%)	48(60%)	314	$\chi^2 = 0.320$; DF=1; P>0.05
	Yes	154(37%)	32(40%)	186	
Diet	Mixed	374(89%)	73(91%)	447	$\chi^2 = 0.344$; DF=1; P> 0.05
	Vegetarian	46(11%)	7(09%)	53	

Table IV. Distribution of hypertension according to BMI

BMI	Normotensive	Hypertensive	Total
<25	271(65%)	41(51%)	447
25-29.99	127(30%)	27(34%)	53
30-35	22(05%)	12(15%)	500
Total	420	80	500

($\chi^2 = 12.068$; DF=1; P< 0.05)

Prevalence of hypertension in bus drivers**Fig 1: Prevalence of hypertension in bus drivers**