



Factors Associated with Hypertension Among Truck Drivers: A Cross Sectional Study at A Check Post on A National Highway in South India
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ABSTRACT

Background: Workers in the transport industry are at greater risk for cardio vascular diseases (CVD) due to their increased diet and sedentary behavior. **Aims:** The aim of the present study is to estimate the prevalence of hypertension among truck drivers and its associated factors. **Methods and materials:** This study was conducted at Walayar check post which is located on a National highway of South India in August 2016. A detailed physical examination was conducted by a team of medical doctors. Socio demographic information were also elicited. **Results:** The prevalence of overweight was 50% and the prevalence of hypertension was 40%. In multivariate data analysis, only history of chronic disease was significantly associated with hypertension. Overweight was not significantly associated with hypertension when controlled for age, duration of driving, smoking, marital status, and history of chronic disease (odds ratio=1.987, $P=0.054$). On further stratified analysis, it was found that higher age (odds ratio=3.160 $P<0.001$) and longer duration of driving (odds ratio=1.076 $P<0.001$) were significantly associated with overweight. Overweight (odds ratio=2.210 $P<0.05$) and history of chronic disease (odds ratio=10.178 $P<0.001$) were significantly associated with high blood pressure after removing both age and duration of driving from this model. Receiver operating characteristic curve analysis relating age with overweight identified 38 years as the optimum cut off value. **Conclusions:** The truck drivers must be educated at their younger age preferably early thirties to prevent overweight and thereby to reduce hypertension.

Keywords: Truck drivers, hypertension, overweight, obesity

INTRODUCTION

The social and economic effect of increased morbidity and mortality associated with cardiovascular diseases (CVD) is a great challenge in both developed and developing countries [1-3]. Many studies have demonstrated that there is a strong correlation between risk factors of cardiovascular diseases and occupational factors [4-7]. Workers in the transport industry are at greater risk of an increased diet and sedentary behavior [8,9]. Truck drivers in India have to travel long distances in their life time on an extensive spread of national and state high ways that range from well-engineered roads to complete absence of concrete roads. Their occupation pre-disposes them to multitude of risk factors such as prolonged sitting and driving, tight running schedules, reduced rest breaks, traffic congestion, the sedentary nature of job and resultant physical, psychological, and behavioral problems [8-10]. Thus, professional drivers in particular have higher mortality, morbidity and absenteeism rates due to obesity. Hypertension is one of the main outcomes of the disease and is common among professional drivers. Considering the inherent risks associated with the profession of truck drivers, the importance of truck drivers to the country's economy and scarcity of studies aimed at evaluating the cardiovascular risk profile among these professionals, the present study is aimed to assess the prevalence of hypertension and the factors associated with hypertension among long distance truck drivers.

METHODS

Study design

This was a cross sectional study conducted at Walayar check post which is located on a National highway of South India on August 2016.

Ethics

Ethical clearance for the study was obtained from Institutional Ethical Committee, PSGIMS&R, Coimbatore.

Sample size: With an expected prevalence of hypertension as 45% [9] and with 20% allowable error, the sample size required for this study was estimated as 122. With a non-response of 20%, the total sample was 153. We totally studied 175 truck drivers.

Inclusion and exclusion criteria

Drivers who came with valid driving license for submission of documents at the check post on the day of survey and those who gave informed consent were included. Drivers with known congenital heart disease and genetic disorders were excluded.

Methodology

A detailed physical examination was conducted by a team of medical doctors. Blood pressure was measured on right arm in sitting position using digital sphygmomanometer. Two readings were taken at 3 minutes interval and the mean of the two was recorded. The following variables were also evaluated: socio demographic characteristics (age, education, family history of CVD, prior diagnosis of chronic disease), physically active, eating patterns, consumption of alcohol or other stimulants and smoking habits.

The following criteria and definitions were used [9]:

- Family history of CVD: when the individual mentions the occurrence of heart disease in a first degree relative.
- History of chronic diseases: truck drivers were asked whether they had been previously being diagnosed with any chronic diseases and what medicines they were taking.
- Subjects were considered physically active if they are performing aerobic (walking, biking, dancing, and racing) or anaerobic activities (body building) at least 150 minutes in a week and moderately active if they do 10 to 150 minutes in a week and insufficient if they do less than 10 minutes in a week.
- Subjects were considered active smokers if they use tobacco daily in any quantity or at quit smoking in the previous 12 months. Subjects were considered non-smokers if they had not used tobacco for the past 12 months.
- For determining the body mass index (BMI) the truck drivers were weighed (in kg) without shoes on a 150 kg mechanical anthropometric scale and height in meter. The BMI levels were classified according to the WHO guidelines [11]; subjects were normal if their BMI was 18.5 kg/m² to 24.5 kg/m², overweight if their BMI was 25.0 kg/m² to 29.9 kg/m², grade 1 obese if the BMI was 30.0 kg/m² to 34.9 kg/m², grade 2 obese if the BMI was 35.0 kg/m² to 39.9 kg/m² and grade 3 obese if the BMI \geq 40.0 kg/m².

Statistics

Data were analysed using SPSS (19). Mean (SD) were calculated for continuous variables and percentages were calculated for categorical variables. Logistic regression analysis was done to estimate the odds ratio and its statistical significance. Hypertension was defined as present in those with systolic blood pressure greater than or equal to 140 mm Hg or those with diastolic blood pressure greater than or equal to 90 mm Hg. For statistical analysis, BMI > 25 kg/m² were considered as overweight. Variables significantly associated (P < 0.2) with hypertension were subjected to multivariate regression analysis. However, due to multicollinearity, stratified analysis was further done to observe the association. Receiver operating characteristic curve analysis was then done to find the optimum cut off value.

RESULTS

The mean age of the study participants were 39.38 years with the minimum age of 22 years and the maximum of 67

years. The prevalence of overweight was 50% and the prevalence of hypertension was 40% (Table 1). In univariate analysis, positive family history, overweight, history of chronic disease, smoking, longer duration of driving, marital status and older age were significantly associated with hypertension ($P<0.2$) (Table 2). However, in the multivariate analysis, only history of chronic disease was found to be significant. Overweight was not significantly associated with hypertension when controlled for age, duration of driving, smoking, marital status and history of chronic disease (odds ratio=1.987; $P=0.054$). On further analysis, it was found that higher age (odds ratio=3.160; $P<0.001$) and longer duration of driving (odds ratio=1.076; $P<0.001$) were significantly associated with overweight. Overweight (odds ratio=2.210; $P<0.05$) and history of chronic disease (odds ratio=10.178; $P<0.001$) were significantly associated with high blood pressure after removing both age and duration of driving from this model. Receiver operating characteristic curve analysis relating age with overweight identified 38 years as the optimum cut off value. Hence it is concluded that the truck drivers must be educated at their younger age preferably early thirties to prevent overweight and thereby to reduce hypertension.

Table 1 Prevalence of hypertension and obesity among the study population

Condition	Number N=175	%
Hypertension	70	40
Raised systolic blood pressure	48	27.4
Raised diastolic blood pressure	51	29.1
Overweight/Obesity	86	49.1

Table 2 Variables associated with hypertension

Variable	Status	Number	Prevalence	Odds ratio	P value
Positive family history	Yes	73	45.2	1.449	0.234
	No	102	36.3	1	
Overweight	Yes	86	50	2.296	0.008*
	No	89	30.3	1	
Family history of chronic disease	Yes	25	84	10.821	0.000*
	No	150	32.7	1	
Smoking	Yes	98	44.9	1.558	0.136*
	No	77	33.8	1	
Old age	Yes	87	47.1	1.813	0.056*
	No	88	33	1	
Marital status (Married)	Yes	137	45.3	3.1	0.007*
	No	38	21.1	1	
Physical activity (Active)	Yes	49	38.8	0.931	0.837
	No	126	40.5	1	
Duration of driving (hours)	-	-	-	1.072	0.000*

$P<0.2$

DISCUSSION

A number of studies have demonstrated that the high prevalence of obesity among workers in the transport industry. According to Moreno, et al. this category of workers has a higher incidence of obesity, physical inactivity, inadequate diet, smoking habits, higher levels of cholesterol and hypertension [12,13]. A study carried out in the United States involving more than six hundred thousand workers found the highest prevalence of obesity to be among male employees who work in the transport services [14]. The worldwide prevalence of hypertension was estimated at 1 billion individuals with approximately 7.1 million deaths occurring per year due to this condition [9]. According to the World Health Organization, systolic blood pressure greater than 115 mm Hg accounts for 62% of cases of cardiovascular disease and 49% of cases of ischemic heart disease. Moreover, arterial hypertension is one of the major risk factors of cerebrovascular accident. In our study, we observed a prevalence of 41%, with a prevalence of raised systolic blood pressure of 27.4% and a prevalence of raised diastolic blood pressure of 29.1% among truck drivers.

We observed that the truck drivers must be educated at their younger age particularly early thirties to prevent overweight and obesity and thereby to reduce hypertension. Young adulthood is a vulnerable period for weight gain and the health consequences of becoming obese during the life span are of serious concern. Unhealthy dieting habits include high sugar sweetened beverage consumption, lower vegetable intake and greater consumption of foods prepared outside

the home, which may place young adult long distance truck drivers at increased risk for overweight and obesity. To improve their nutrition and health, as they progress through the life cycle, it requires approaches specifically targeted to this group. Strategies and programs for obesity prevention of truck drivers should include both individual level and population level approaches. However, the evidence base for prevention of weight gain and halting overweight and obesity in young adulthood truck drivers is currently limited.

CONCLUSION

The data in the present study allow us to draw conclusion that long distance truck drivers are highly vulnerable to develop CVD because of the high prevalence of obesity and hypertension observed. The accumulation and association of risk factors and unique features of this profession indicate that traditional actions could not change the scenario. Appropriate health care actions based on comprehensive policies that focus on the truck drivers work environment and monitoring of these factors must be established. More research into programs tailored to the needs of young truck drivers is warranted.

ACKNOWLEDGEMENTS

The authors are extremely thankful to Dr. Arvind Pandey, Director, National Institute of Medical Statistics, New Delhi, Dr. Thomas V Chacko (Professor and Head), Dr. SL Ravi Shankar (Professor), Dr. M Sivamani (Professor), Dr. Sudha Ramalingam (Professor) and Dr. S Karthikeyan (Assistant Professor) of the Department of Community Medicine, PSG Institute of Medical Sciences and Research, Coimbatore for their valuable guidance at various stages of the study. The authors are also extremely thankful to Mr. Abdul Navas, Regional Transport Officer, Palghat for permitting us to do this study. We are also thankful to Mr. Vinod, Head of Marketing and Mr. Sirajudeen for helping us to conduct this study.

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