Original Article

Prevalence of Cardiovascular Diseases risk factors among auto-rickshaw drivers

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ABSTRACT

Research question: What is the prevalence of some cardio-vascular disease (CVD) risk factors among auto-rickshaw drivers (ARDs) working in Nagpur city of India? **Methods:** This cross-sectional study was conducted from June 2007 to December 2008 at the auto-rickshaw stand of Nagpur railway station. Out of total 6000 auto-rickshaw drivers (ARDs) of Nagpur city, 296 were studied. **Results:** Mean age of ARDs was 41.70±9.05 years. Their mean length of occupation was 17 years and average daily working was 11½ hours. 40.20% subjects had habit of tobacco chewing; while 35.14% were smokers and 34.12% were alcohol consumers. Only 16.89% subjects were engaged in regular physical exercise. 27.36% subjects had 'moderate' or 'severe' self reported stress. Mean weight of these auto-rickshaw drivers was 58.59±9.25 kg; while their mean body mass index (BMI) was 21.95±3.48 kg/m^2. 14.86% subjects were overweight and another 3.38% had obesity. 37.16% subjects had pre-hypertension; while 104 (35.14%) subjects had hypertension. 4.73% of the ARDs also had a family history of hypertension. **Conclusions:** As the prevalence of various CVD risk factors is high; there is an urgent need of regular health check-ups and appropriate preventive and promotive interventions among these auto-rickshaw drivers.

Key words: Auto Rickshaw Drivers (ARDs), Cardio Vascular Disease (CVD) risk factors, Smokers, Tobacco Chewers, Obesity, Hypertension.

Introduction:

The environment in which drivers spend majority of their time is polluted, noisy and dangerous[1]. Drivers are exposed to harmful environment like pollutant gases, continuous noise and whole-body vibration as well harmful lifestyle like irregularity of meals, bad posture while driving and stressful occupational conditions due to their working conditions[1]. These work-related harmful factors may be associated with various gastro-intestinal, musculo-skeletal, cardio-vascular, respiratory, hearing and other problems which can have driving safety implications [1, 2].

In India auto-rickshaws are main mode of public transport in urban and semi-urban areas. These auto-rickshaws are a cheap and easily available source of public transport in most of the cities. Nagpur is one of the biggest cities and 2nd capital of Maharashtra. It is situated in the central part of India. Like many other cities; the auto-rickshaws are main mode of public transport in Nagpur city. As for any other professional drivers; drivers of these auto-rickshaws are exposed to many kinds of risks due to their profession. Many of these risks are also the risk factors for various cardio-vascular diseases (CVD); which is one of the leading killers of mankind worldwide.

A lot of studies had been conducted worldwide on the prevalence of various CVD risk factors among truck, bus and taxi drivers [3-12] but no such study is ever done in auto-rickshaw drivers of India. So this study was conducted with objectives of finding the prevalence of some CVD risk factors among auto-rickshaw drivers working in Nagpur city and to make suitable recommendations based on the study findings.

Material and Methods:

Study population: All the auto-rickshaw drivers (ARDs) working in Nagpur city were the study population. It was learnt that approximately 6000 auto-rickshaw drivers were working in Nagpur city at the time of study. **Study design:** It was a cross-sectional study conducted among auto-rickshaw drivers (ARDs) working in Nagpur city. **Duration of study:** The study was done from June 2006 to December 2008. **Site of study:** The auto-rickshaw stand of Nagpur railway station was chosen as the site of study. The reason for selection of this site was the fact that most of the auto-rickshaws of city come to railway station daily and so all the auto-rickshaw drivers working in Nagpur city were available for participation in the study (Representativeness). **Methodology:** The auto-rickshaws coming to Nagpur railway station usually have to wait for 1–1½ hours in the queue of pre-paid booth for their turn. This time was used for interview and examination of these auto-rickshaw drivers. A separate room was arranged near railway station for conducting interviews and examinations of the study participants. Approval from institutional ethical committee was taken before commencing the study. Data collection was done by using pre-designed proforma. A pilot study was done on 100 subjects to check the feasibility of the study and to test the proforma. Sample size for the study

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Received: 25/05/11 **Accepted:** 20/06/11

was also calculated based on the findings of this pilot study; as no study was found on the CVD risk factors among auto-rickshaw drivers in India or elsewhere. In pilot study prevalence of hypertension (one of the important risk factor for CVD) was found to be 36%. So for prevalence (p) of 36%, 95% confidence interval, 80% power of study and allowable error (L) of 15% (of p); sample size of 296 was calculated after correction for finite population. Subjects were conveniently selected after confirming that they had enough time to get interviewed and examined. Confidentiality of the study subjects was assured and maintained throughout the study. Informed consent of each study participant was taken before starting the interview. Subjects were particularly asked regarding their smoking and alcohol drinking habits, involvement in physical exercise, any mental stress etc. Detailed clinical examination was done which included weight and height measurement and blood pressure (BP) recording by using standard procedures and standardized instruments. Statistical analysis: For analysis of data, statistical package for social science (SPSS) version 13.0 was used.

Results:

Socio-demographic characteristics:

A total of 296 auto-rickshaw drivers were studied. Mean age of study subjects was 41.70±9.05 yrs with a range of 20-65 yrs. 42.35% subjects were e"45 years of age. All 296 subjects in the present study were male. 142 (47.97%) subjects were Hindus; while 126 (42.57%) were Muslims. 294 (99.32%) subjects were ever married. 166 (56.08%) subjects belonged to nuclear family. 83 (28.04%) subjects had secondary education; while 72 (24.32%) had primary education. 139 (46.96%) subjects belonged to upper lower socio-economic class according to modified kuppuswamy classification while 131 (44.26%) belonged to lower middle class.

Occupational characteristics:

Mean length of occupation was 17.00±7.62 years with a range of 1-35 years; while average daily working hours was 11.52±2.29 with a range of 6-17 hours. 9 (3.04%) subjects were not taking any break during working hours but most (59.80%) of the subject was taking one break. Mean of total duration of break during working time was 1 hr 38 min ± 1 hr 6 min with a range of 0-5 hrs.

Personal habits/addictions:

Table 1 shows distribution of study subjects according to their personal habits/addictions. 119 (40.20%) subjects had habit of tobacco chewing; while 104 (35.14%) subjects had habit of tobacco smoking, 101 (34.12%) had habit of alcohol consumption, 23 (7.77%) had habit of Gutkha chewing and 3 (1.01%) had habit of other drug abuse.

Average duration of alcohol consumption was 14.53±8.03 years. Average amount of alcohol consumed per session was 179.40±66.39 ml. 15.20% of the subjects were consuming alcohol on a 'daily' basis, while 3.38% were taking it on an 'alternate day' basis and 9.46% were consuming alcohol on 'weekly' basis. The average duration of tobacco smoking was 19.04±7.27 years. 100 (33.78%) subjects had habit of 'Bidi' smoking and 4 (1.35%) had habit of 'Cigarette' smoking. Average number of units smoked per day was 19.98±6.73 with a range of 5-25 units per day. All those who smoke, used to smoke daily.

Overall only 17.91% subjects had no personal habit; while most, 49.32%, of the subjects had 1 personal habit. 88 (29.73%) subjects had 2 personal habits, 8 (2.70%) had 3 personal habits and only 1 (0.34%) had 4 personal habits. Mean number of personal habits/addictions per subject was 1.18±0.76 with a range of 0-4.

Tobacco consumption:

Overall 211 (71.28%) subjects used to consume some form of tobacco (either in form of smoke or chewable or both); while rest (28.72%) were not consuming any tobacco product.

Regular physical exercise:

50 (16.89%) subjects were engaged in regular physical exercise; while 246 (83.11%) were not engaged in regular physical exercise.

Self-reported stress:

215 (72.64%) subjects had 'none' or 'mild' self-reported stress, while 81 (27.36%) had 'moderate' or 'severe' self-r ported stress.

Weight, height and body mass index:

Table 2 shows the distribution of subjects according to their body mass index (BMI). Mean body mass index (BMI) of 199 (67.23%) subjects was found to be in normal range (18.50-24.99 kg/m2); while BMI of 54 (18.24%) subjects was in higher range (e"25.00 kg/m2). It was also observed that 43 (14.53%) subjects were under-weight (BMI <18.5 kg/m2), 44 (14.86%) subjects were overweight (BMI= 25.00-29.99 kg/m2) and 10 (3.38%) of the subjects had class I obesity (BMI= 30.00-34.99 kg/m2). None of the subjects had class II obesity (BMI= 35.00-39.99 kg/m2) or class III obesity (BMI e"40 kg/m2)

Blood pressure:

Table 3 shows the distribution of study subjects according to their blood pressure (BP) levels. 82 (27.70%) subjects were found to have normal blood pressure (SBP<120 mm of Hg and DBP<80 mm of Hg); while 110 (37.16%) subjects had pre-hypertension (SBP 120-139 mm of Hg and or DBP 80-89 mm of Hg) and 104 (35.14%) subjects had hypertension (cutoff value of 140 mm of Hg for SBP and or 90 mm of Hg for DBP). Among hypertensives, 57% (60 of 104) had grade I hypertension (SBP 140-159 mm of Hg and or DBP 90-99 mm of Hg) and 43% had grade II hypertension (SBP e"160 mm of Hg or DBP e"100 mm of Hg).

Family history of hypertension:

4.73% of the Auto-rickshaw drivers also reported a family history of hypertension.

Table 1: Distribution of study subjects according to personal habits/addictions (n=296)

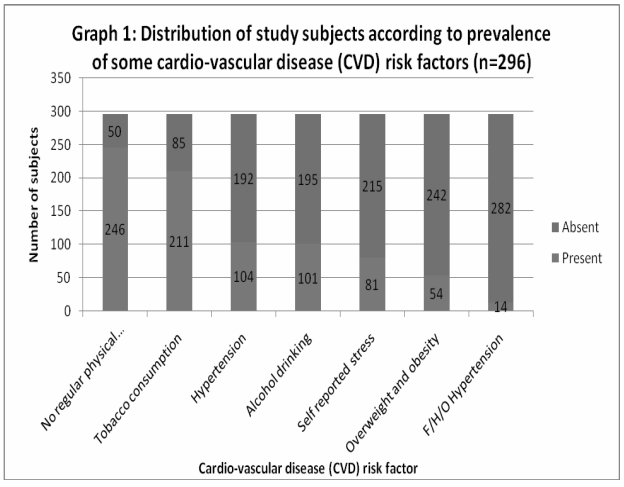
Personal habits/addictions	Number of subjects	Percentage (%)
Tobacco chewing	119	40.20
Tobacco smoking	104	35.14
Alcohol drinking	101	34.12
Gutkha chewing	23	7.77
Other drug abuse	3	1.01
No personal habit/addiction	53	17.91

Table 2: Distribution of study subjects according to their body mass index (n=296)

Body mass index	Number of subjects	Percentage
<18.5 kg/m^2	43	14.53
18.50-24.99 kg/m^2	199	67.23
25.00-29.99 kg/m^2	44	14.86
?30.00 kg/m^2	10	3.38

Table 3: Distribution of study subjects according to their blood pressure (n=296)

Blood pressure levels	Number	Percentage
SBP<120 mm of Hg & DBP<80 mm of Hg	82	27.70%
SBP 120-139 mm of Hg & or DBP 80-89 mm of Hg	110	37.16%
SBP 140-159 mm of Hg & or DBP 90-99 mm of Hg	60	20.27%
SBP?160 mm of Hg or DBP? 100 mm of Hg	44	14.87%



Discussion:

In the present study prevalence of various cardio-vascular risk factors was assessed. Prevalence of smoking (35.14%) and hypertension (35.14%) and mean body mass index (21.95 kg/m^2) were comparable with other short distance drivers worldwide (Smoking prevalence 14-64%[3-7]; mean BMI 21.3 kg/m^2,[12]; HT prevalence 12-56%[5,8-11]. Regarding other cardio-vascular disease risk factors; 83.11% were not engaged in regular physical exercise, 34% had alcohol consumption, 27.36% had 'moderate' or 'severe' self reported stress and 4.73% had a family history of hypertension.

Not all the known CVD risk factors could be assessed due to various reasons. Like presence of hypercholesterolemia and diabetes mellitus (DM) could not be assessed due to financial constraint; while effects of dietary factors could not be assessed due to irregularity of diet and lack of required time for dietary assessment. Effects of sex, hormones and OC pills were also not assessed as all the study subjects were male.

Conclusions:

As the prevalence of CVD risk factors i.e. tobacco smoking, sedentary lifestyle, obesity, mental stress and HT is quite high; there is an urgent need of regular and appropriate preventive & promotive interventions. Further studies are also recommended to quantify the impact of these risk factors for future occurrence of CVDs among auto-rickshaw drivers.

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Source of Support: Nil, **Conflict of Interest:** None