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ASSESSEMENT OF CARDIOVASCULAR RISK FACTORS AND BMI AMONG PROFESSIONAL COMMERCIAL DRIVERS IN SAGAR DISTRICT OF CENTRAL INDIA: A CROSSECTIONAL STUDY.

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ABSTRACT **Introduction :** The commercial professional drivers are at risk of developing diabetes, hypertension and obesity due to the nature of their work as they tend to go early, work for many hours , have irregular dietary habits and sleep pattern and sedentary lifestyle.The study sought to determine the known risk factors in order to better clarify the burden of this health issue in Sagar district of Central India. **Method :** A crossectional descriptive and analytical study was conducted among 496 commercial professional drivers and blood sugar, blood pressure and height and weight was measured . The life style related risk factors were assessed using semistructured questionnaire and also dietary pattern was assessed. The student T test and Chisquare test were used for statistical analysis. **Results:** The youngest person was 22 years old and oldest was 66. The mean age was 39.55±12.53 years. The mean number of years for which they were in job was 17.5 ± 9.62 and they worked for a mean duration of 13.56 ± 2.87 hours. The other risk factors found was alcohol intake and smoking,irregular dietary pattern, lack of physical activity and sleep. **Conclusion:** There is a need for intervention to promote a healthy life style and curb the prevalence of diabetes, hypertension and overweight to improve the health of drivers and safety of passenger.

KEYWORDS : drivers, diabetes, hypertension, alcohol

INTRODUCTION

Sedentary life style, poor nutrition, and numerous stresses share risk factors for a group of diseases known as Chronic diseases of lifestyle (CDL), also called noncommunicable diseases[1].CDL are strongly associated with a higher risk of heart disease, diabetes, respiratory disease and cancer; these 4 diseases are responsible for over 50% of mortality worldwide. Certain jobs predispose workers to health hazards related to CDL.Professional drivers have a higher prevalence of occupational disorders than other driversbecause of exposure to harmful environment like pollutant gases, continuous noise and whole-body vibration as well harmful lifestyle like irregular eating habits, addictions, insufficient sleep, bad posture while driving and stressful occupational conditions[2,3]. The world health organization estimate that the number of deaths due to traffic accidents will increase by 65% between the years 2000 and 2020 with this figure expected to be as high as 80% in developing countries[4]. Despite the high costs related to traffic accidents involving professional drivers throughout the world there are few scientific studies addressing the demographic and clinical profile, prevalence of cardiovascular risk factors, and incidence of fatal or incapacitating outcomes (cardiovascular events and sleep disordered)

The present study was undertaken to assess their cardiovascular response, workload , and discomfort. Moreover, we aimed to investigate the known risk factors in order to better clarify the burden of this health issue in Sagar District of Central India.

METHODOLOGY

This Crossectional descriptive analytic study was carried in Sagar district of central India the study was conducted during the month of October-November 2023. The estimated sample size of our study was 230. All the subjects were males due to the nature of work as commercial drivers are males. The institutional ethical committee permission was obtained.

Data Collection And Measurements

All the participant information about their occupation, lifestyle, habit of smoking, alcohol,medical history and class of driving license (light or heavy vehicle) was obtained by personal interview using a pretested semistructured questionnaire. The information regarding height, weight, blood pressure, blood sugar levels, triglycerides and cholesterol levels were recorded.

BP was measured manually using a mercury column sphygmomanometer and stethoscope by the auscultatory method. Before BP recording patient was seated comfortably for at least 15 minutes. Two readings with at least 15minutes gap were taken. The average of two readings was taken as the BP. All blood samples were collected in the morning following 8 hours of fasting.The body mass index (BMI) was calculated by measuring subjects' height and weight. The weight was measured using a beam type weighing scale. Height was measured with the subject in an erect position against a vertical surface. The collected information then was analyzed using different descriptive and analytic methods with the use of the SPSS software version 14. The collected data was tabulated using Microsoft Excel 2007 and analyzed using EpiInfo 3.5.1. Quantitative variables were summarized as means and qualitative variables were summarized as proportions. Quantitative variables were tested for statistical significance using Student's t-test. Qualitative variables were checked for statistical significance using the Chi-Square test. For all statistical tests, a P value <0.05 was taken as significant.

RESULT

In the current study, 230 drivers comprised of both light and heavy vehicle drivers were assessed in terms of diabetes, hypertension and its risk factors. Amongst the participants, 60.8% had class 1 driving licenses (for light) and 39.2% had class 2 licenses (for heavy vehicles). The important sociodemographic characteristics of the study population are summarized in Table 1. The youngest person was22years old and the oldest was 66. The mean age was 39.55±12.53 years (range 21–70 years). Mean number of years for which the study subjects were in the job of driving was 17.5 ± 9.62 years (range 3–38). On most days they worked for a mean duration of 13.56 ± 2.87 hours (range 4–18). The sociodemographic, personal, and occupational

characteristics of the study population (n = 230) are summarized in Table 1.

Table 1. Sociodemographic, Personal, And Occupational Characteristics Of The Study Population (n = 496).

Characteristic	N (%)
Age (years)	
21–30	132 (26.61%)
31–40	181 (36.49%)
41–50	110 (22.18%)
51–60	50 (10.08%)
61–70	24 (4.84%)
Place of residence	
Rural	304 (61.29%)
Urban	192 (38.71%)
Educational status	
Illiterate	15 (3.02%)
Primary	63 (12.7%)
High School	242 (48.79%)
Graduate	177 (35.69%)
Marital status	
Unmarried	47 (9.48%)
Married	442 (89.11%)
Divorced	7 (1.41%)
Consumption of Main Meal From Restaurants	
Regular	170 (34.27%)
Occasional	326 (65.73%)
Dietary habits	
Non-Vegetarian	160 (32.26%)
Vegetarian	336 (67.74%)
Family history of illness	
Hypertension	132 (26.61%)
Diabetes Mellitus	248 (50%)
Renal Disease	24 (4.84%)
Whether diabetic?	
Yes	132 (26.61%)
No	364 (73.39%)
Addictions	
Smoking	
Non Smokers	54 (10.89%)
Current Smokers	408 (82.26%)
Quit Smoking	34 (6.85%)
Alcohol consumption	
Never Consumed Alcohol	144 (29.03%)
Occasionally	194 (39.11%)
Daily	157 (31.65%)
Bettle Leaf Or Tobacco Chewing	
Yes	330 (66.53%)
No	166 (33.47%)
Monthly income in rupees	
Up to 5000	78 (15.73%)
5001–10000	162 (32.66%)
10001 and Above	257 (51.81%)
Personal Habits	
Inadequate sleep	175 (35.28%)
Inadequate physical activity	201 (40.52%)

The association between HTN and Diabetes and various sociodemographic, medical, personal, behavioural, occupational, and dietary risks factors is shown in Tables 2 and 3

Table2. Dependence Between Sociodemographic, Medical, Personal, And Behavioural Characteristicsand Hypertension

Risk Factor	Total Subjects	With Hyper-tension	Without Hyper-tension	Test statistic (χ 2)	p-Value
Age					
≤35 years	216	50	166	48.73	~ 0.00
>35 years	280	153	127		
Place of Residence					
Rural	304	117	187	1.68	0.19
Urban	192	86	106		
Education Qualification					
Up to primary school	78	45	33	9.95	0.002
Higher secondary and above	418	158	260		
Marital Status					
Unmarried or divorced	54	24	30	0.17	0.68
Married	442	179	263		
Family History of Hypertension					
Present	132	35	97	14.65	0.0001
Absent	364	168	196		
Family History of Diabetes					
Present	248	89	159	4.8	0.028
Absent	248	114	134		
Monthly Income (in INR)					
Upto 10000	240	113	127	6.8	0.009
>10000	256	90	166		
Smoking					
Non Smoker	88	23	65	14	0.0009
Smoker (Less than 1 pack a day)	207	81	126		
Smoker (More than 1 pack a day)	201	99	102		
Alcohol Consumption					
Never	144	43	101	12.49	0.002
Occasionally	194	95	99		
Daily	157	65	92		
Bettle Leaf Or Tobacco Chewing					
Present	330	162	168	26.18	~ 0.00
Absent	166	41	125		
Sleep					
Adequate	321	105	216	24.45	~ 0.00
Inadequate	175	98	77		
Physical Activity					
Adequate	295	81	214	53.26	~ 0.00
Inadequate	201	122	79		

Table 3. Dependence Between Sociodemographic, Medical, Personal, And Behavioural Characteristicsand Diabetes

Risk Factor	Total Subjects	With Diabetes	Without Diabetes	Test statistic (χ 2)	p-Value
Age					
≤35 years	216	37	179	16.77	~ 0.00
>35 years	280	95	185		
Place of Residence					
Rural	304	85	219	0.56	0.45
Urban	192	47	145		
Education Qualification					
Up to primary school	78	35	43	14.71	~ 0.00
Higher secondary and above	418	97	321		
Marital Status					
Unmarried or divorced	54	13	41	0.08	0.77
Married	442	119	323		
Family History of Hypertension					
Present	132	50	82	10.92	0.0009
Absent	364	82	282		
Family History of Diabetes					
Present	248	95	153	33.54.	~ 0.00
Absent	248	37	211		
Monthly Income (in INR)					
Upto 10000	239	60	179	0.40	0.52
>10000	257	72	185		
Smoking					
Non Smoker	88	22	66	16.07	0.0003
Smoker (Less than 1 pack a day)	207	38	169		

Smoker (More than 1 pack a day)	201	72	129		
Alcohol Consumption					
Never	144	21	123	32.90	~ 0.00
Occasionally	194	44	150		
Daily	157	67	90		
Bettle Leaf Or Tobacco Chewing					
Present	330	98	232	4.34	0.037
Absent	166	34	132		
Sleep					
Adequate	321	38	283	99.56	~ 0.00
Inadequate	175	94	81		
Physical Activity					
Adequate	295	61	234	12.39	~ 0.00
Inadequate	201	71	130		

The association between BMI and HTN and Diabetes is shown in table 4. The patient was divided in various BMI category based on WHO Category of BMI in (kg/m^2)

Table 4. Prevalence Of Hypertension And Diabetes According To The Who's BMI Categories

WHO Category of BMI (kg/m2)	Number of Subjects	Hypertensive	Diabetics
<18.5	39	26	11
18.5–24.99	280	105	81
25–29.99	138	52	32
≥30	39	20	8

DISCUSSION

The aim of the present study was to characterize the population of drivers with respect to demographic and clinical profile and cardio vascular risk factors.

The population was composed of young male adults approximately 37% under 40 years with mean age 39.55 + 12.53 years . According to the work done by many authors the average age of commercial drivers was 40.78+8.6,38.8+13.7,41.2+8.6 and 41.2+11.7 respectively[5,6,7] Educational background of commercial drivers has been found to differ at different places. In this work the educational profile of commercial drivers was 3%,12%,48%,and 35% had no formal education, primary, high school and graduates respectively somewhat similar findings was reported by Achulo et al. [6]. The majority of drivers opt for this occupation because they have limited educational qualification for securing good job of their interest and financial difficulty to start their own business[7].

In this present work it was found that majority of the drivers depend on foods from restaurants (65%) as most of the drivers skip food in their homes. These foods contains increase salt, fats and high calorie[8,9].Moreover lack of physical activity along with disturbed sleep contribute to the development of of hypertension, diabetes, overweight and obesity. Most drivers consume alcohol because it is seen as means of relaxation after hard day work , appetite enhancement . alcohol when consumed excessively has been found to accumulate triglycerides, increase blood pressure and increase calorie intake[10,11]

The overall prevalence of HTN in our study group is higher than the reported pooled prevalence of about 16–20% in India [12]. In the general population the prevalence of HTN is higher in Kerala compared to the rest of India. [13,14,15]. Thankappan et al. reported a HTN prevalence of about 30% among males aged 30–59 years in Kumarakom, a relatively rural area in Kerala [13]. The prevalence of hypertension in similar age group in our study was 49.96%. Another study conducted in Chemmaruthy, Varkala, a rural area, gives HTN prevalence of 31.2% among males 20–59 years old [15]. A third study reports a prevalence of 56.3% among urban males aged 40–60 years which is comparable to our finding of 54.3% in the same age group[14]. 61% of the drivers studied reside in rural areas. The urban prevalence of HTN could be due to the drivers acquiring life style risk factors seen in urban population. This may be due to the habits associated with the job.Among subjects with age up to 35 years, 50 (23%) were hypertensive, which is also high. The genetic predisposition among Indians for acquiring cardiovascular risk factors early in life, coupled with the unhealthy lifestyle, could be the cause of high HTN prevalence in the young [16,17].Prevalence of HTN increased with age as reported in prior studies similar to our study (54%). There was strong correlation between age >35 years and hypertensive status. The responsibility of supporting family members was found to be associated with HTN. Supporting a larger family obviously requires more money. The possibility of drivers working overtime to meet their financial needs was considered.Probably, having to support a large family caused a degree of mental stress and anxiety which contributed to the risk of HTN.

There was significant association between prevalence of HTN and being overweight (BMI ≥ $25kg/m^2$). This is in accordance with the published studies. It is seen that morbidity and mortality due to CVDs in Indians are higher in people with lower BMI when compared to Western population [12]. So, some have advocated a cutoff point of $23kg/m^2$ for normal BMI among Indian population.

HTN and diabetes mellitus often go hand in hand as part of the metabolic syndrome.

10.5% of our subjects had blood sugar ≥ 126. Prevalence of diabetes in professional drivers in Hong Kong is reported to be 8.1% [18]. In one study carried out on truck and bus drivers in Kashan, this prevalence was demonstrated to be 7% [8]. Therefore, it can be asserted that these findings seem to be in accordance with each other. However, it may be postulated that this prevalence can vary in different populations considering diet and genetics in various regions of the world [19].

According tovarious literature, a greater number of the risk factors for diabetes makes its development more probable [20,21]. Such a relationship was also observed in this study: the concurrence of two of the risk factors for diabetes, namely excessive body weight and hypertension, increased the risk of hyperglycaemia more than 3.5 times. It should then be concluded that in road transport drivers, excessive body weight and elevated arterial blood pressure are the risk factors for diabetes.

The present study has limitations that should be addressed. Our study does not show casual association since we used crossectional study design and there were no control group and no follow up. The sample size of drivers was less to generalize our results on total population of drivers.

The high prevalence of HTN, overweight as well as of the hyperglycaemia indicates a need to undertake multidimensional actions targeted on this particular professionand involving various health care sectors. More attention should be paid in providing better health care to elder drivers, especially those with excessive body weight or elevated blood pressure. More frequent prophylactic and detailed pre-placement examinations should be considered, depending on the rate and intensity of the disorders diagnosed. This should be coupled with an introduction of primary and secondary prevention activities, including proper diet, physical activity and relevant treatment. GPs of these drivers should monitor the patients health condition, providing current data to occupational medicine services and arranging prophylactic activities.

Conflict of Interest: No

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