Original Article

Hypertension and obesity among professional drivers who work transporting loads

Hipertensão arterial e obesidade em motoristas profissionais de transporte de cargas

Hipertensión arterial y obesidad en choferes profesionales de transporte de cargas

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ABSTRACT

Objectives: To verify the prevalence of hypertension and obesity among professional freight truck drivers and associate them with studied variables. **Methods:** It is a cross-sectional study covering a sample of 258 professional freight truck drivers, traveling on the highway BR-116, on the Regis Bittencourt portion, in Sao Paulo state. **Results:** Drivers were young adults (37.5±10 years), 19% were smokers, 55% reported drinking alcohol, 74% were sedentary, 57% used sleep-inhibiting drugs; they traveled an average of 800 km/day and drove 10 hours/day. The prevalence of hypertension was 37%, 46% were overweight, 36% were obese and 58% had high waist circumference. The logistic regression analysis indicated that hypertension was associated (OD: Odds ratio, CI: confidence interval 95%) with: increased body mass index (OR = 1.183 CI 1.065 to 1.314); blood glucose (OR = 1.039 CI 1.004 to 1.076); and habit of using drugs that inhibit sleep (OR = 0.322 CI 0.129 to 0.801). **Conclusion:** Among professionals was significant the presence of hypertension, overweight and obesity.

Keywords: Risk factors; Obesity; Cardiovascular disease/prevention; control; Occupational health

RESUMO

Objetivos: Verificar a prevalência de hipertensão arterial e obesidade em motoristas profissionais de transporte de carga e associá-la com variáveis estudadas. **Métodos:** Estudo transversal abragendo amostra de 258 motoristas profissionais de transporte de cargas que trafegavam pela Rodovia BR-116, no trecho paulista Regis Bittencourt. **Resultados:** Os motoristas eram adultos jovens (37,5±10 anos), 19% tabagistas, 55% referiram ingestão de bebidas alcoólicas, 74% sedentários, 57% usavam medicamentos inibidores do sono, percorriam em média 800 km/dia e dirigiam 10 horas/dia. A prevalência da hipertensão arterial foi de 37%, 46% tinham sobrepeso, 36% obesidade e 58% circunferência abdominal aumentada. A análise de regressão logística indicou que a hipertensão arterial se associou (OD: *Odds ratio*, IC: intervalo de confiança a 95%) com: aumento do índice de massa corporal (OR=1,183 IC 1,065-1,314); glicemia (OR=1,039 IC 1,004-1,076); e hábito de ingerir medicamento para inibir o sono (OR= 0,322 IC 0,129-0,801). **Conclusão:** Foi expressiva a presença de hipertensão, sobrepeso e obesidade nesses profissionais.

Descritores: Fatores de riscos; Obesidade; Doenças cardiovasculares/prevenção e controle; Saúde ocupacional

RESUMEN

Objetivos: Verificar la prevalencia de hipertensión arterial y obesidad en choferes profesionales de transporte de carga y asociarla con variables estudiadas. **Métodos:** Estudio transversal abarcando una muestra de 258 choferes profesionales de transporte de carga que circulan por la carretera BR-116, en el trecho Regis Bittencourt, en el estado de Sao Paulo. **Resultados:** Los choferes eran adultos jóvenes (37,5±10 años), 19% tabaquistas, 55% refirieron ingestión de bebidas alcohólicas, 74% sedentarios, 57% usaban medicamentos inhibidores del sueño; recorrían en promedio 800 km/día y conducían 10 horas/día. La prevalencia de la hipertensión arterial fue de 37%, 46% tenían sobrepeso, 36% obesidad y 58% circunferencia abdominal aumentada. El análisis de regresión logística indicó que la hipertensión arterial se asoció (OD: *Odds ratio*, IC: intervalo de confianza de 95%) con: aumento del índice de masa corporal (OR=1,183 IC 1,065-1,314); glucemia (OR=1,039 IC 1,004-1,076); y hábito de ingerir medicamentos para inhibir el sueño (OR= 0,322 IC 0,129-0,801). **Conclusión:** Entre los profesionales fue expresiva la presencia de hipertensión arterial, sobrepeso y obesidad.

Descriptores: Factores de riesgos; Obesidad; Enfermedades cardiovasculares/prevención y control; Salud ocupacional

* *Research involving professional truck drivers on Interstate BR-116 Régis Bittencourt in São Paulo State.*

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INTRODUCTION

Arterial hypertension is one of the main risk factors for cardiovascular illnesses, which are the main cause of mortality in Brazil. In 2006, 302,682 deaths occurred in the country due to circulatory system diseases[1]. Among these, cerebrovascular disease was the main cause of death, followed by acute myocardial infarction. The mortality ratio due to cardiac diseases in Brazil is one of the highest in comparison with other countries[2-3].

In the context of cardiovascular diseases, obesity stands out. Arterial hypertension is six times higher in obese than in non-obese people and for each 10% increase in body weight, incidence level of coronary disease increase by approximately 20%[4]. Brazilian data indicate that 32% of the population has some degree of excess weight[5-6]. Moreover, obesity is one of the main risk factors for other non-transmissible illnesses like type 2 diabetes mellitus and should be considered a chronic illness and a public health problem. In this sense, the earlier arterial hypertension and obesity are detected, the better pharmacological and non-pharmacological measures can be put in practice. The goal of such interventions is to control these illnesses, avoiding or reducing complications characterized by target organ damage.

Studies in specific populations can be useful to adopt health care strategies. Professional truck drivers can be more exposed to cardiovascular risks due to the peculiar characteristics of their profession. In general, these professionals eat in restaurants that mostly offer high-calorie and low-nutrition foods, and the association between an inadequate diet and sedentary life turn these people more exposed to obesity and its consequences. Hence, in view of the importance of cardiovascular illnesses in the morbidity-mortality context and, among their risk factors, hypertension and obesity, this research aimed to: verify the prevalence of arterial hypertension and obesity and identify related variables in professional truck drivers on Interstate BR-116 Régis Bittencourt Highway in São Paulo State.

METHODS

It is a cross-sectional study with 258 male professional long-haul (more than 50 km/day) drivers who travel on Interstate BR-116 Régis Bittencourt Highway in São Paulo State. Approval for the project was obtained from the Research Ethics Committee at the University of São Paulo School of Nursing. The sample was calculated for one dichotomous variable in a descriptive research with an expected case proportion of 20%, precision set at 0.10 (0.5 above and 0.5 below), confidence level at 99%, resulting in 250 persons. Inclusion criteria were: the driver's agreement to participate in the study, having a professional driver's license from the National Traffic Department (categories C, D or E) and being fully active for work.

Data were collected in three gas stations located on the specified part of the Interstate. The choice of these sites is justified by the fact that many drivers use them to sleep over. As soon as they had parked their trucks, the drivers were randomly invited to participate in the study. Those who accepted to participate were advised to fast for 12 hours, not consume alcoholic beverage and caffeine products. Data were collected by the researcher, who worked at an advanced support base of the Emergency Medical Care Service in the gas station located at km 323. Interviews were held and anthropometric data were assessed in a private room in each of the gas stations.

For data collection, an interview was held, with questions on sociodemographic variables like monthly revenues (in *reais*), age (in years), color/ethnic origin (self-declared), education level (primary, secondary and higher education), civil status (single, married, widowed, living in a stable union) and time on the job (in years). For data analysis, the color/ethnic origin variable was classified as white (drivers who mentioned their skin color was white) and non-white (those who mentioned a mulatto or black skin color). Education level was classified as < 8 years (finished or unfinished primary education) or > 8 years (finished or unfinished secondary education). Civil status was classified into: with a partner (married or living in a stable union) and without a partner (single or widowed). Regarding the smoking habit, the assessment took into account whether the driver smoked regularly, was a former smoker (at least 12 months ago) or had never smoked. Alcohol consumption was assessed through the Alcohol Use Disorders Identification Test-AUDIT validated in the Brazilian culture. Former drinkers were considered people who indicated they had stopped 12 months ago or longer. In the assessment of physical activity, sedentary people were considered to be anyone who did not fit into the consensus defined by *The National Institutes of Health*, recommending that all adults and children should perform at least 30 minutes of physical activity, either continuously or on the whole. Information on current (considering the last three months) or previous sleep inhibitor consumption was also requested. Work-related variables included: daily work journey (actual time driving without stops), distance driven every day (in km/day) and whether they had been victims of assaults or traffic accidents.

The blood pressure measurement was performed with an automatic validated device on the superior left limb, sitting position and legs uncrossed, with the arm supported at the height of the heart and a cuff adapted to the arm size. The interviewees were asked to empty their bladder and not consume any alcohol, coffee or tobacco 30 minutes before the measurement. Three

consecutive measurements were taken at two-minute intervals. People with systolic pressure levels ≥ 140 mmHg and/or diastolic levels ≥ 90 mmHg, according to the V Brazilian Hypertension Guidelines[6], or who reported use of antihypertensive drugs were considered hypertensive. Weight (in kilograms) and height (in meters) were verified to calculate the body mass index (BMI), whose formula is weight (kg)/height2 (m). The BMI was classified according to the criteria of the World Health Organization (WHO) as: healthy (<25 kg/m2), overweight (25 to 29.9 kg/m2) and obese (≥30 kg/m2. Waist circumference was determined midway between the lower costal margin and the iliac crest. It was classified according to WHO criteria as: ≥94 cm with increased risk for cardiovascular events and ≥102 cm highly increased risk. For laboratory tests, 10ml of peripheral blood was collected through a vacuum system after confirming the 12-hour fasting period.

For statistical analysis, $p<0.05$ was considered statistically significant. Categorical variables were analyzed by the chi-square test and group analysis in continuing variables by Student's t-test. Statistically significant variables in univariate analysis were used to adjust the logistic regression model.

RESULTS

All drivers were men and relatively young, with an average age between 30 and 40 years. A majority declared they were white; had not finished primary education; had a partner, in marriage or a stable union; and lived a sedentary life. Little more than half consumed alcoholic beverages; mentioned previous use of sleep inhibitors; and only 19% were smokers. The average daily work journey took 10 hours, driving approximately 800 km per day. Little less than half (46%) indicated they transported scheduled loads, 35% had been victim of a traffic accident, 23% with fatal victims, and 25% had been victims of assaults (Table 1).

Blood pressure assessment showed that 37.2% of the drivers presented levels compatible with arterial hypertension. With regard to the lipid profile, more than one third showed high triglyceride (38.3%) and total cholesterol (33%) levels, and a little less (25.2%) for the LDL-c fraction. Besides, a very high (84%) percentage of drivers was found with HDL-c below adequate levels. Other findings included a higher percentage (81.8%) of drivers with a body mass index above adequate levels and more than half (58.5%) with increased waist circumference (Table 2).

A statistically significant association was found between blood pressure and the following variables: body mass index (30.7 ± 4.6 vs. 27.7 ± 4.1, respectively, waist circumference (103.1 ± 13.0 cm vs. 94.5 ± 12.1 cm, respectively), glucose (95.2 ± 23.8 mg/dL vs. 86.9 ± 13.9 mg/dL, respectively) and triglycerides (191.3 ± 152.3 mg/dL vs. 140.0 ± 81.4 mg/dL, respectively). Hence, participants with higher body mass index, waist circumference, glucose and triglycerides showed pressure levels compatible with arterial hypertension (Table 3).

Table 1 – Truck drivers on the Brazilian Highway Régis Bittencourt according to biosocial characteristics. 2008.

Variable	n (%)
Male gender	258 (100)
Color/ethnic origin (self-declared)	
White	235 (91.0)
Non white	23 (9.0)
Education level (years)	
≤ 8	190 (74.0)
> 8	68 (26.0)
Civil status	
With partner	215 (83.0)
Without partner	43 (17.0)
Intake of alcoholic beverages	142 (55.0)
Smoking	50 (19.0)
Regular physical activity	67 (26.0)
Use of sleep inhibitors	146 (57.0)
Transportation of scheduled loads	120 (46.0)
Victim of assault	59 (23.0)
Previous traffic accident	90 (35.0)
Fatal victims during accidents	20 (23.0)
Daily work load (h/day)	10.0 ± 4.0
Age (years, mean ± standard deviation)	37.5 ±10.0
Distance driven (km/day, mean ± standard deviation)	782.9 ± 229.6

Table 2 – Clinical characteristics of truck drivers on the Brazilian Highway Régis Bittencourt. 2008.

Variable	n (%)	Mean ± standard deviation
Blood pressure ≥140/90 mmHg)	96 (37.2)	
Body mass index (kg/m²)		28.9 ± 4.55
Healthy (< 25)	47 (18.2)	
Overweight (25 – 29,9)	117 (45.3)	81.8
Obesity (≥30)	94 (36.5)	
Waist circumference (cm)		97.7 ± 13.1
< 94 (normal)	107 (41.5)	
94 – 102 (increased risk)	70 (27.1)	
> 102 (highly increased risk)	81 (31.4)	
Glucose (≥110 mg/dL)	18 (7.0)	89.92 ± 18.52
Total cholesterol (≥200 mg/dL)	85 (33.0)	188.17 ± 37.44
LDL-c (≥130 mg/dL)*	65 (25.2)	109.40 ± 33.19
HDL-c (≤60 mg/dL)**	217 (84.1)	49.32 ± 12.52
Triglycerides (≥150 mg/dL)	99 (38.3)	158.52 ±114.70

*LDC-c=Low Density Lipoprotein / **HDL-c=High Density Lipoprotein

In the logistic regression model, the presence of pressure levels in the arterial hypertension range was associated with the following variables: body mass index, glucose and the sleep inhibitor consumption habit. For each additional unit in the body mass index, the possibility of blood pressure levels compatible with arterial hypertension increased by 18.3%; for each unit increase in glucose levels (1mg/dL), the possibility of arterial hypertension increased by 3.9%, while the habit to consume sleep inhibitors exerted a protective effect on the possibility of developing arterial hypertension (Table 4).

Table 3 – Blood pressure level in truck drivers on the Brazilian Highway Régis Bittencourt according to mean and SD of body mass index, waist circumference, glucose and triglycerides. 2008.

Variable	Arterial pressure (mmHg)	
	< 140/90	≥ 140/90
Body mass index (kg/m²)	27.7 ± 4.1	30.7 ± 4.6*
Waist circumference (cm)	94.5 ± 12.1	103.1 ± 13.0*
Glucose (mg/dL)	86.9 ± 13.9	95.24 ± 23.8*
Triglycerides (mg/dL)	140.0 ± 81.4	191.3 ± 152.3*

*p < 0.05.

DISCUSSION

The main merit of this research was that it determined health conditions in professional truck drivers on one of the most important Brazilian interstate highways regarding arterial hypertension and obesity. Considering drivers with systolic blood pressure levels of ≥ 140 mmHg and/or diastolic levels ≥ 90 mmHg, the prevalence of arterial hypertension was 37%. This finding exceeds recent international data[7] and, in Brazil, data for other similar professional groups, such as urban bus drivers[8] and health professionals[9]. The higher prevalence of pressure levels compatible with arterial hypertension may be influenced by the psychological and physical stress these professionals are exposed to in their work, due to scheduled load transportation, large distances driven and long daily work journeys. These aspects can also contribute to the use of sleep inhibitors and, consequently, to the high traffic accident levels on the highway. Research, also involving professional drivers, has shown a positive association between illegal drugs use, fatigue and traffic accidents[10-11].

Arterial hypertension showed a significant association with higher body mass indices, waist circumference, glucose and triglyceride levels, as expected. Arterial hypertension, glucose intolerance, hypertriglyceridemia, low HDL-c and hyperinsulinemia constitute the so-called "Metabolic Syndrome", which entails increased risks for atherosclerotic disease and cerebrovascular accident[12-13].

With regard to the body mass index, weight gain was an independent factor for the presence of blood pressure levels characterized as hypertension. High prevalence levels were found for overweight and obesity, even higher than in other Brazilian studies[14-15]. This fact was repeated in the waist circumference analysis, which was also higher in comparison with ratios observed in the South of Brazil[16-17]. Although abdominal obesity and obesity itself increase cardiovascular risks, increased waist circumference is associated with obstructive sleep apnea, which results in oxyhemoglobin desaturation episodes, provoking frequent awakening at night and, hence, sleepiness during the day[18-19]. Studies have demonstrated a positive relation between the presence of obstructive sleep apnea and greater risks of traffic accidents[20-21].

Regarding the lipid profile, findings were similar to Brazilian studies. It is emphasized, however, that the drivers' age was relatively younger, which may evidence early lipid alteration, as a result of their inadequate lifestyle[22-23]. As for life habits, particularly alcoholic beverage consumption, findings were similar to two Brazilian studies in the same professional group[22-24], but higher when compared with population-based studies in the South of Brazil[25].

The association revealed through the logistic regression analysis between arterial hypertension and increased glucose can be understood by the fact that both have risk factors in common, the so-called "common ground" of causality. On the other hand, the association between arterial hypertension and higher body mass indices demonstrates the influence of increased body weight on several unfavorable health outcomes, such as diabetes mellitus and arterial hypertension. The sleep inhibitor intake habit showed to act as a protective factor for arterial hypertension. This association supposedly derives from the fact that consuming sleep inhibitors was more frequent in younger drivers (35.34 ± 8.65 vs. 40.43 ± 11.06 years, p< 0.05), so that increased age exerted little effect on the onset of arterial hypertension.

Preventing and controlling chronic illnesses is a permanent challenge for health team members. Nurses, as a part of this group, should take actions to guide these people towards the adoption of a healthier lifestyle. The control of hypertension and excess body weight aims to prevent complications, besides favoring the control of other associated morbidities, thus avoiding early mortality. These people present peculiarities that can influence care delivery. The absence of signs and symptoms does not allow people to perceive the risks they are exposed to, making it more difficult to adhere to treatment and modify risk behaviors. Besides these aspects, lack of

Table 4 - Results of logistic regression model for arterial hypertension (≥140/90 mmHg) in truck drivers on the Brazilian Highway Régis Bittencourt. 2008.

Variable	Estimated parameter	Standard error	p	Odds Ratio	CI 95%	
Intercept	-8.52	2.00	0.0001			
Body mass index (kg/m²)	0.17	0.05	0.0017	1.1830	1.0650	1.3140
Glucose (mg/dL)	0.04	0.02	0.0299	1.0390	1.0040	1.0760
Sleep inhibitor intake habit	-1.13	0.47	0.0148	0.3220	0.1290	0.8010

knowledge on the disease in terms of origins, causes, consequences and control also result in low treatment adherence ratios. This is clearly revealed during activities with hypertensive people[26-27].

CONCLUSION

This research evidenced high prevalence level of arterial hypertension, overweight and obesity. The association between arterial hypertension and obesity is similar to literature data, highlighting that the participants were younger and fully active professionally. Another important observation was alcoholic beverage and sleep inhibitor consumption, which could raise traffic accident levels on the Interstate BR 116, known under the sad alias of the "Highway of Death". These study findings were presented to the service coordinators responsible for the highway. First, an orientation manual on cardiovascular risk factors was elaborated, highlighting arterial hypertension.

In the context of chronic illnesses, arterial hypertension, obesity, diabetes mellitus, hypercholesterolemia show similar characteristics: they are chronic, need treatment across the lifespan and often show no specific signs. In view of the aspects evidenced in this research, changes in life habits need to be stimulated, characterized by regular physical activity, body weight control, decreased alcoholic beverage consumption and abstinence from smoking. In this sense, nurses and other interprofessional team members should act as catalysts to identify the necessary changes. In nursing activities, the importance of health education programs stands out, encouraging the adoption and maintenance of healthy life patterns and stimulating preventive decision making to modify risk behaviors.

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