**THE OVERWEIGHT WITH PREDICTOR OF RISK FOR HIPERTENSION IN BUS DRIVERS**

**OVERWEIGHT HIPERTENSION IN BUS DRIVERS**

**ABSTRACT**

Blood pressure (BP) has been currently associated with several markers of risk for cardiovascular disease as well as excess body weight but still there is little evidence on the association of Body Mass Index (BMI) with BP in bus drivers. In this sense the purpose of this study was to verify that the association of BMI with BP in bus drivers, in a second check which the risk of individuals with excess weight tables for high blood pressure. The sample consisted of 75 bus drivers were evaluated where the BMI is body mass divided by height squared and high blood pressure data analysis was descriptive, Pearson correlation and odds-ratio with a p<0.05. We found a significant relationship between BMI and blood pressure r = 0.438 (p <0.05). They found that individuals with excess weight have 4.04 times more likely to have high blood pressure (p<0,05). Through the presented results it was ended that individuals who have excess weight are more likely to develop frameworks for high blood pressure.

**KEY WORDS: Overweight, Blood Pressure, Bus Drivers.**

**INTRODUCTION**

Currently, there are increasing concerns about being overweight in the world population, since this is considered a severe public health problem also affecting drivers of public transport. (WHO, 2009. VIEGAS; OLIVEIRA, 2006). These factors are related to the lifestyle of these individuals as well as the activities carried out during working hours (GIROTTO et al, 2009, ROCHA et al, 2002).

According to Ko et al. (2007) among Chinese workers there is a trend in increased accumulation of fat, due to various situations and concerns that the office requires a fact common bus driver (MO), because their workday activities with predominantly few movements and many are not significant to raise the rates of energy expenditure (LANDIM, VICTOR, 2006). By contrast, the literature shows that subjects classified as physically active, along with a good cardio condition associated with low levels of risk factors for hypertension even (RANKINEN et al., 2007, CHASE et al., 2009. KRUEGER; FRIEDMAN , 2009. KNUTSON; CAUTER, 2008. VIEGAS; OLIVEIRA, 2006).

Thus, when we use an assessment tool as the measurement of blood pressure (BP) to detect hypertension, we observed that this factor has been associated with several markers of risk arising from the sedentary lifestyle adopted by BD (ASAYAMA et al. 2009, Sarno et al. 2008). In this same perspective, the accumulation of body fat is considered the main factor that can cause high BP, because its prevalence reaches large proportions including BD, continually increasing the chances of developing metabolic and cardiovascular disorders in the most capable of get serious death (Gustavsson et al, 1996).

For Fuchs et al. (2005) and Feijão et al, (2005) identified significant associations (p <0.05) between BMI and hypertension. However in Brazil, few studies were meant to show that the risk drivers eutrophic and overweight need to develop clusters of hypertension. (Lamb et al, 1993. SANTANA et al, 2001).

In this sense the objective of this study was to determine the prevalence of overweight and hypertension, and see what is the odds ratio of BD presented overweight hypertension.

**METHODOLOGY**

Sample Description

The sample consisted of 75 bus drivers were male, mean age 38.6 ± 5.7 years old in the city of Ponta Grossa - Brazil, all employees in the enterprise and with the same hours of service corresponding to 8 (eight ) hours of work by day. The study included only those who have expressed interest and voluntarily signed consent form according to law 196/96 of human research approved by the ethics committee of Federal university of Paraná – Brazil, number 200.401.518.7.

Instruments and procedures

For the measurement of weight was used a digital scale Filizola® with a capacity of 200 Kg and resolution of 100 grams which is properly calibrated measurement made only by an expert evaluator inter avoiding error. Subjects were instructed to attend the first evaluation with sport clothing (shorts and shirt) (Gordon, Chumlea, Roche, 1988). In the measurement of the stature of a stadiometer was used brand Gofeka / Cardiomed® with a capacity of 220 cm and 0.1 mm resolution in which the subject was evaluated barefoot with her head in the Frankfurt plane (Gordon, Chumlea, Roche, 1988).

The body mass index (BMI) was calculated by reason the weight value by measuring the height to square. After calculating individuals with BMI <25 (Kg / m²) were classified as normal and subjects with BMI ≥ 25 (Kg / m²) were classified as overweight (OW) (WHO, 1998).

Systolic blood pressure (SBP) and diastolic (DBP) was measured by using a mercury sphygmomanometer MOD / PLUS ® for adults. A (SBP) was determined in the first appearance of sound (Korotkoff phase I) and (DBP) with the disappearance of sound (Korotkoff phase V).

Subjects were classified as hypertensive if the SBP was greater than or equal to 130 mmHg and DBP greater than or equal to 85 mmHg, or identifying the use of antihypertensive medication (NCEP ATP III, 2001). Only were classified as hypertensive subjects evaluated three times a week with an assessment, and after this period of collection of three weeks were considered in this context that the subject had three measurements above 130 mmHg for 85.

The average blood pressure (ABP) was given by the formula: ABP = SBP + (DBP X 2)/3.

Statistical analysis consisted of descriptive statistics of mean, standard deviation and relative frequency were then checked the relationships between variables by establishing the Pearson correlation. Finally a logistic regression was performed to estimate odds ratios, to see what the odds ratio of an overweight person has to get blood pressure levels considered a risk to health. The confidence interval was 95% and significance level was p <0.05.

**RESULTS**

After analysis of the data in Table 1 presents the sample description, calling attention to the mean BMI of bus drivers (BD) is classified as overweight.

Table 1. Sample description.

|  |  |  |
| --- | --- | --- |
| Variables | Mean | SD |
| Age (years) | 38.60 | ±5.70 |
| weight (Kg) | 79.44 | ±14.70 |
| Height (cm) | 168.79 | ±8.53 |
| BMI (Kg/m²) | 27.87 | ±4.35 |
| Systolic blood pressure (mmHg)  | 121.33 | ±15.71 |
| Diastolic blood pressure (mmHg) | 79.66 | ±11.80 |
| Average blood pressure (mmHg) | 93.55 | ±12.35 |

According to the criteria adopted by the study design can be seen in Figure 1 the behavior of the sample with respect to BMI and BP checking the proportion of normal subjects and those who are at risk.

Figure 1: Distribution of the proportion of normal individuals and a risk to health.

Ao observarmos os resultados acima podemos verificar para o IMC uma alta prevalência de sujeitos com excesso de peso 70,7%. Para a hipertensão foi encontrada uma prevalência de 24%, que apesar de menor comparado ao IMC, também se mostrou alta.

Para verificar a relação entre o IMC com a pressão arterial média dos bus motoristas foi realizado uma correlação de Pearson aonde se encontrou r=0,414 com p< 0,05, reforçando a hipótese de que o IMC esta diretamente relacionado com a BP, ou seja, quanto maior o IMC maior será a BP.

Table 2. Incidence of hypertension estimated odds ratio according cm nutritional status.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **HYPERTENSION** | **Full** |  |  |
|  | **NO** | **YES** | **N** | **OR (IC 95%)** | **p** |
| Normal | 20 | 2 | 22 | 1 | - |
| Overweight | 37 | 16 | 53 | 4.32 (1.043 – 20.731) | 0.04 |

Table 2 above we can see that most of the subjects already overweight with hypertension reinforcing the fact that overweight people have more chances to make this disorder.

**DISCUSSION**

This study shows results on BDque concern towards health, because when we look at is the average BMI is above 25 kg / m² (range classification of overweight), noting that BD are overweight, immediately intervention should be implemented to reduce and control weight in order to prevent the database on the risks of maintaining the index levels in the present study, since the literature suggests that losing weight reduces the chances of developing cardiovascular disease (CVD ) and coronary artery disease (CAD) because excess weight is strongly associated with several factors that contribute to the onset of CAD (BITSKINASHVILI, 2006; ASAYAMA et al., 2009).

Because of the high mean BMI of the subjects found a high prevalence of overweight. To Sarno et al, (2008) conducted in workers of Sao Paulo - Brazil found a prevalence of overweight of 55.9% for men, while for Cavagnori et al. (2008) found a prevalence in drivers road, about 85% of the sample with BMI above 25 kg/m2, this same study that found a prevalence of 70.7% of OW), a fact that draws attention because all these reported findings are based on the same working condition, but in different types of traffic events that reinforce the theory that drivers have OW can be considered the biggest indicator of health risk due to several studies indicate that the higher oa total body mass the greater the chance of presenting CVD and CAD (BITSKINASHVILI, 2006; NGUYEN et al., 2009).

On the prevalence of hypertension, our study showed 24% of individuals with this disorder. The same was seen in the study of Cassani et al. (2009) who found a prevalence of high blood pressure (HBP) of 28% of industrial workers. In the study by Sarno et al, (2008) the prevalence reached values ​​of 38.1% of men (HBP). In contrast to the study of Correa Filho et al. (2002) presented a prevalence of 13.2% of BD with clusters of hypertension, however used the cutoff 140mm/Hg and 90 mm / Hg, unlike the present study that used the cutoff suggested by the NCEP-ATPIII criteria for diagnosing hypertension, may be the main reason for the high rate of this disease.

In the case of anthropometric characteristics on the risk of CVD and CAD, BMI is considered a strong indicator for these disorders as shown in the studies of Nguyen et al. (2009) Mishra et al. (2006), Mufunda et al. (2005) and Fuchs et al. (2005), who find a positive association with p <0.01 between BMI and blood pressure, indicating an increase in their values ​​when increasing BMI values. But the literature shows differences as in the study of Cassani et al. (2009) found no significant associations between BMI and blood pressure.

In response to a possible cause of the association between BMI and blood pressure Bitskinashvili (2006) showed significant correlation of LDL-c with BMI and LDL-c is responsible for irritation of the blood vessel wall can turn even in atherosclerosis, which turn decreases the lumen of the vessel, obstructing the passage of blood requiring that increases the stroke volume of blood so that it can pass the sites of greatest resistance, thus requiring increasing the blood pressure both systolic and diastolic. In this sense, Fuchs et al. (2005) add that the correct use of indicators can provide insights into the research or predicting the onset of coronary artery disease (CAD).

But to show the relationship between BMI and blood pressure a linear regression model is required as shown in the study of Kshirsagar et al. (2006) which showed that subjects with high BMI have 3.54 more likely to develop coronary heart disease than normal subjects. This result is similar to this study which found an odds ratio of 4.04 times of BD with overweight have high blood pressure.

In Mishra et al. (2006) have found that obese men and women are three times more likely (p <0.05) of developing hypertension compared with normal weight individuals supporting the hypothesis that weight control programs should be frequent in the workplace, especially in the present study in which 70.7% of the population are overweight.

According to Sarno et al, (2008) has found an odds ratio of 3.9 for subjects with excess weight, a result that is collaborating with the literature, so it presents the epidemiological association between overweight and high blood pressure .

Adverse effects of overweight on blood pressure and even cholesterol levels, representing about 45% of the increased risk of CAD, even for overweight, there is a significantly increased risk of developing these diseases independently of traditional risk factors (BORGERS et al., 2007). But this study the lipid profile has not been studied and this is a limitation of the study.

Thus Bitskinashvili (2006) rates of systolic and diastolic blood pressure depend on the concentration of fat in the abdominal region of the subject, because the increase in BMI is associated with insulin resistance which is activating the sympathetic nervous system and enhances sodium reabsorption may well explain the increase in BP values ​​especially in obese patients with hypertension (MOANA et al, 1995). But not so in the present study evaluated the concentrations of insulin and abdominal fat these being other limitations of this study.

**CONCLUSION**

Conclude that the nutritional status of the bus drivers provided by the BMI can be considered as an important indicator of health riskmainly with regard to blood pressure, where statistically significant associations were observed in overweight subjects. These data suggest that the higher the nutritional status of the bus drivers, the more chances of being hypertension. Further studies involving this issue by checking indicators of cardiovascular risk workers should be conducted, aimed at improving the lifestyle and promoting health respectivoslocais even in their work.

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