A Comparative Study Of Blood Pressure Of Sri Lankan Bus Drivers

A Group Study Conducted For The Year 2005 August 2nd MBBS Examination

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Batch 2003/2004
Faculty of Medicine
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This study was done during the period, December 2004 to March 2005 in fulfillment of the requirements for the 2nd MBBS examination, year 2005 August

This Study is dedicated to
All Sri Lankan Bus Drivers

Contents

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2. Abstract

A Comparative Study of Blood Pressure of Sri Lankan Bus Drivers

Introduction

Initial observations showed that Sri Lankan bus drivers worked in quite a stressful environment. Therefore it was hypothesized that they have a higher average mean arterial pressure compared to the general public. The aims and objectives of this study was to determine whether the average Mean Arterial Pressure of bus drivers showed a significant change compared to a control group and to determine whether bus drivers were exposed to risk factors of hypertension more than the control group.

Materials and Methods

Blood Pressure and Heart rate were measured in 117 bus drivers and 123 age and BMI matched controls chosen randomly from the general public. Data regarding age, height, weight, alcohol consumption, smoking habits, pressure medication, cardiovascular diseases in subject and family, diabetes in subject and number of working hours per day and days per week were obtained using a data collection sheet.

Age (25 to 55 years) and BMI (17 to 35 kg/m2) were controlled. Bus conductors and other professional drivers were excluded.

Results and Analysis

Mean arterial pressures were compared using the unpaired students t –test. Exposure to risk factors was compared using pie charts and bar graphs.

There was a significant difference ($P<0.05$ and $t=2.177$) in mean arterial pressure between bus drivers and the controls. Also there were significant changes in diastolic blood pressure ($t=2.731$ and $P<0.05$) and heart rate ($t=2.433$ and $P<0.05$)

The percentage of smokers was higher in bus drivers (51%) compared to the controls (36%).

Bus drivers worked on average 281.4 hours per month compared to 260.9 hours per month by the controls, which showed a significance difference ($P<0.05$).

Other risk factors did not show great changes.

Conclusions

The conclusions in this study were that average mean arterial pressure of bus drivers was significantly higher compared to the control group and that this may have been due to the higher percentage of smokers and the higher number of working hours per month in bus drivers compared to the controls.

3. Introduction

Driving a vehicle in Sri Lanka is a very difficult and strenuous task. Narrow roads, potholes and reckless driving together with undisciplined pedestrians make driving safely in Sri Lanka almost impossible.

These conditions apply to bus drivers as well who unlike in other countries race rickety old buses without automatic gears or power steering along typical Sri Lankan roads, most of the time competing with fellow drivers to get the most number of passengers in the least amount of time during a particular turn.

There is a lot of breath taking overtaking, hard breaking and also waiting for long periods of time stuck in city traffic in the hot tropical sun, breathing dust and vehicle smoke, accompanied by continuous vibrations from start to finish. These initial observations led us to believe that Sri Lankan bus drivers may have different blood pressure values compared to people of other occupations.

The term blood pressure usually means arterial blood pressure and is the force that drives blood through the body tissues. Measurement of blood pressure is done to test the normal functioning of the cardiovascular system. The pressure in the major arteries rise to a peak value called systolic pressure during contraction of the heart and then falls to a minimum figure called diastolic pressure during relaxation of the heart. Traditionally the arterial blood pressure is given in millimeters of mercury (mmHg) as systolic pressure over diastolic pressure with 120/80mmHg being cited as the normal value in many references. But variations do not necessarily mean an abnormality (Dale, 1997).

There are two main physiological factors that affect blood pressure i.e. cardiac output and peripheral resistance. Both of these factors have a direct relationship with blood pressure. A change in cardiac output will normally affect systolic pressure and a change in peripheral resistance will normally affect diastolic pressure.

There are also two physical factors that affect blood pressure. They are blood volume and arterial elasticity. Arteries have an elastic nature and tend to expand with increased blood flow. But with progressive atherosclerosis, there is a tendency for the elasticity to reduce, thus increasing the blood pressure (Berne, 1992).

Hypertension occurs when blood pressure is constantly higher than normal in an individual (for that persons age group.). A blood pressure value over 140/90mmHg is taken as hypertension (Dale, 1997).

Hypertension is a form of cardiovascular disease (**CVD**) and out of a recorded 925079 CVD deaths, hypertension accounted for 35,830 in a study conducted in the United States (Dale, 1997).

3.1 Risk factors of hypertension

1. Age

There is a tendency for blood pressure to rise with the age, becoming quite marked in the elderly (McGeown, 2002). This means that when defining normal blood pressure, the age of the person should be taken into consideration. The increase with age may be explained by the decreased compliance and elasticity of the arteries with ageing (Case, 1994). A study on bus and truck drivers has shown that the difference of blood pressure increased with age (Hartvig, 1983)

2. BMI, Diet and Obesity

The Body Mass Index (**BMI**) is used to obtain a relationship of an individuals weight and height and to determine whether a individual is at a healthy weight. It is thought to be an accurate indicator of body fat content. To obtain the BMI value weight of an individual (in kilograms) is divided by the height (in meters) squared. The BMI values obtained from people can be interpreted in the following manner according to the WHO criteria.

BMI<18.5 – Underweight
BMI 18.5-24.9 – Normal weight
BMI 25.0-29.9 – Overweight
BMI>30.0 – Obese

In overweight and obese people the serum lipid content is high and in obese people, the risk of atherosclerosis and hypertension is high (Dupuy, 1995). A study has shown that there is a tendency for hypertension to increase with degree of obesity (Ueda, 1992)

One of the main reasons for obesity is bad dietary habits. Consuming food rich in fat and carbohydrate may lead to obesity. Consumption of salt may increase blood pressure. The degree to which hypertension can be ameliorated or prevented will obviously vary with the salt sensitivity of the individual. (Ganong, 1999)

3. Alcohol

Alcohol consumption causes hyperlipidemia by increasing the serum Very Low Density Lipoprotein (VLDL) and cholesterol concentrations. This has been shown to lead to atherosclerosis and hypertension. (Motulsky, 1989).

Studies have shown that consumption of 200g-300g of alcohol per day is associated with increases in blood pressure. People who consume an average of two or more drinks per day (>30ml) have higher mean blood pressure levels and prevalence of hypertension than people who drink small quantities. Also epidemiological studies have shown that chronic alcohol consumption is associated with high blood pressure (Motulsky, 1989).

4. Smoking

Nicotine in cigarette smoke has a similar action to sympathetic nerve stimulation of the cardiovascular system and increase the blood pressure. In people with hypertension, nicotine produces a further rise in blood pressure and it has been shown

that in both men and women, smoking is associated with an increase in blood pressure (Ashton, 1982).

Studies have shown that the risk of having carotid atherosclerosis for a person who had smoked for 40 years was approximately 3.5 times that of a non smoker (Whisnant, 1990). Atherosclerosis as we know lead to increased blood pressure values.

5. Diabetes

In patients with uncontrolled Diabetes Mellitus, the tissues cannot take up glucose for energy production and thus tend to use fatty acids. This causes an increased serum lipid concentration leading to atherosclerosis. Therefore hypertension may occur in diabetics secondary to atherosclerosis and also renal injury caused by high blood sugar concentrations (Guyton, 1996).

6. Stress

Stress can be divided into two categories i.e. psychological stress and physical stress. Psychological stress may develop due to problems in the home, work place ect. A probable but not commonly accepted theory, is that psychological indicators may influence the traditional risk factors (of hypertension) in a harmful way (Hartvig, 1983)

Physical activity such as driving can cause physical stress. Blood Pressure was shown to be higher when driving or loading than when resting or on a day off (Sato,1999). One study showed that professional drivers showed more than twice the overall exposure to stressful work factors compared to referents (Belkic, 1998). Another study showed that there was a positive association between diastolic blood pressure and cumulative working time (Cordeiro, 1993).

During stress there is increased blood levels of cortisol and catecholamines, which increase serum lipid concentration and metabolic activity (Burgess, 1992).

Therefore continuous exposure to stress will increase the risk of atherosclerosis, which together with increased metabolic activity can increase the arterial pressure.

Exercise which can deemed a form of physical stress can on one hand increase blood pressure due to increased metabolic activity. But in the long run it may reduce the risk of atherosclerosis by reducing serum lipid concentrations and thus reduce the prevalence of high blood pressure.

7. Race

Studies have been done to see if race has a relationship with blood pressure, using blacks and whites as subjects (Albright, 1992). But the relevance of this to Sri Lanka is not known.

3.2 Hypothesis

Our hypothesis is that, the mean arterial pressure of bus drivers is higher than that of the controls.

4. Aims and Objectives

The aims and objectives of this study were,

- To determine whether the Mean Arterial Pressure of bus drivers shows a significant difference compared to a control group.

- To determine whether bus drivers are exposed to risk factors of hypertension more than the control group.

5. Materials and Methods

Sampling

To fulfill our aims and objectives, it was decided to obtain Blood Pressure, Heart Rate and other relevant data of bus drivers and an age and BMI-matched control group (in other occupations) comprising of the general public.

Inclusion Criteria

All subjects chosen were males, aged between 25 and 55 years and had a BMI between 17 and 35 kg/m2

Exclusion Criteria

Subjects outside the above age and BMI ranges, females, bus conductors and other professional drivers (eg. three wheeler drivers, van drivers) and people with visible mental and physical illnesses were excluded.

Choosing of Bus Drivers

Panideniya town, Gampola privet bus stand, Bogambara bus park, Goods-Shed bus stand were targeted as potential data collection sites for bus drivers.

Choosing of Controls

The Medical Faculty premises, Panideniya Town, Kandy office of the housing authority and the Kandy Police Station were targeted as potential data collection sites for controls.

Taking Information regarding Risk Factors

As volunteers came forward at the data collection sites, they were comfortably seated and explained what was to be done. After their consent was taken, they were asked to fill a questionnaire regarding Age, Alcohol Intake, Smoking Habits, Pressure Medication, history of Cardiovascular Disease in the subject and his family, history of Diabetes and number of hours on the job. Drivers were asked the route they worked and the distance driven per day as well as the number of years working as a driver. Controls were asked for their occupation. All information was noted in a data collection sheets, (See Appendix p.22)

Measuring Heart Rate and Blood Pressure.

At least five minutes were taken to fulfill the above task so as to rest the volunteers as much as possible prior to blood pressure measurement. Next the heart rate was noted by palpating the radial pulse. Blood pressure was measured by the non-invasive manual Auscultatory method using a mercury sphygmomanometer and a stethoscope.

The clothing was removed completely from the right arm and the cuff of the sphygmomanometer was tightly wrapped around the brachium so that its lower border was roughly two to three centimeters above the cubital fossa. It was made sure that the sphygmomanometer, cuff and the observer’s eye were at the same level as the heart of the volunteer.

Then the stethoscope was placed on the cubital fossa of the volunteer (where the brachial artery is supposed to be) and the pressure was increased above the systolic pressure. Next the pressure was reduced little by little until rhythmic tapping 'Korotkoff' sounds were first heard and the pressure at this point was noted as systolic pressure. The pressure was then further reduced until the Korotkoff sounds suddenly became faint and disappeared and the pressure at this point was noted as the diastolic pressure.

Measuring the Height

After measuring the blood pressure, the height of each volunteer was measured using a measuring tape, after the volunteer removed his footwear. It was made sure that the volunteer had his feet together and stood as erect as possible while looking directly forward and had his back to the measuring surface. (E.g.: a wall)

Measuring the Weight

The weight of the volunteers was measured using a bathroom scale after they removed their footwear and emptied their pockets.

Blood pressure was measured twice in volunteers whose blood pressure was over 140/90mmHg after they rested for another five minutes.

Statistical analysis

All data collected was computed and analyzed using Microsoft Excel and SPSS and interpreted as required to fulfill our aims and objectives.

6. Results

A total of 117 bus drivers and 123 controls from the general public volunteered for the study. All the subjects were males. The results obtained by the analysis of data are shown below. The age range for all the subjects was 25 to 55 years and the BMI range was 17 to 35 kg/m^2

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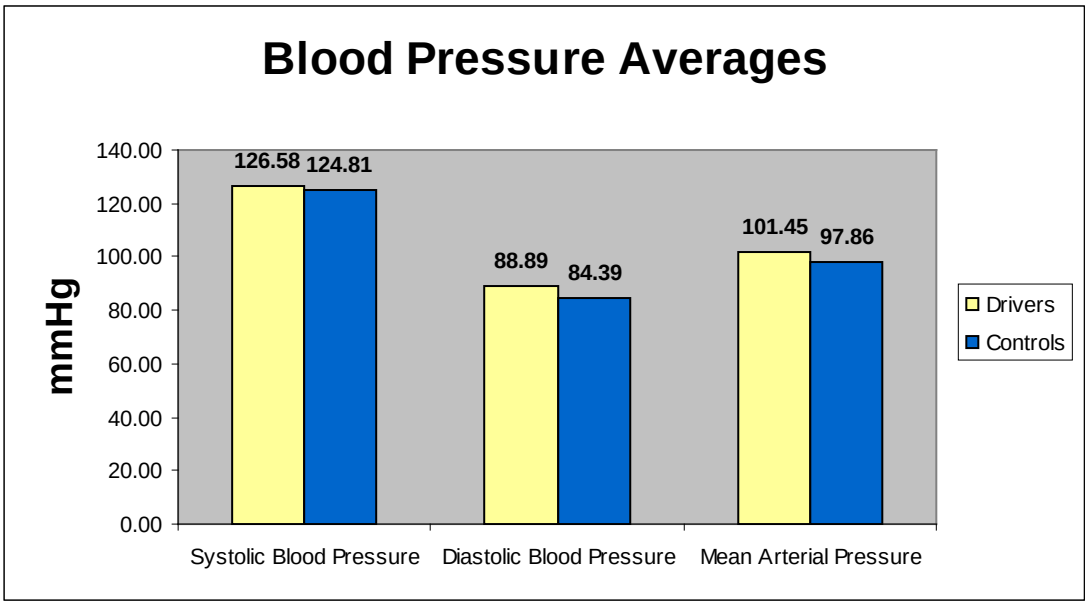

Fig 1: Systolic, diastolic and mean arterial blood pressures in bus drivers and controls.

The above graph shows that the mean systolic and diastolic blood pressures and average mean arterial pressure is higher in the bus drivers than the controls.

Table 1: Mean Arterial Pressures in bus drivers and controls

SUBJECT	Mean (mmHg)	N	Std. Deviation
Drivers	101.45	117	12.79
Controls	97.86	123	12.74
Total	99.61	240	12.87

The above table shows that the average mean arterial pressure of bus drivers is higher than that of the controls.

Table 2: Independent Samples t-Test for Mean Arterial Pressure between bus drivers and controls

	t-test for Equality of Means						
	T Value	Degree of Freedom	Significance (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Equal variances assumed	2.177	238	.030	3.59	1.65	.34	6.84

According to the above table, t =2.177 and P< 0.05 . Therefore there is a significant difference in the mean blood pressures between two groups, at a confidence interval of 95%.

Table 3: Mean Systolic Blood Pressures in bus drivers and controls

SUBJECT	Mean (mmHg)	N	Std. Deviation
Drivers	126.58	117	14.69
Controls	124.81	123	16.35
Total	125.67	240	15.55

The above table shows that the mean systolic blood pressure is slightly higher in the drivers than the control group.

Table 4: Independent Samples t-Test for Systolic Blood Pressure in bus drivers and controls

	t-test for Equality of Means						
	T	Degree of Freedom	Significance (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Equal variances assumed	.880	238	.380	1.77	2.01	-2.19	5.73

According to the above table, t =0.880 and P>0.05. Therefore there is no significant difference in the systolic blood pressures between the two groups.

Table 5: Mean Diastolic Blood Pressures in bus drivers and controls

SUBJECT	Mean (mmHg)	N	Std. Deviation
Drivers	88.89	117	13.22
Controls	84.39	123	12.30
Total	86.58	240	12.93

The above table shows that mean diastolic pressure is higher in the drivers than the control group.

Table 6: Independent Samples Test for Diastolic Blood Pressure in bus drivers and controls

	t-test for Equality of Means						
	T	Degree of Freedom	Significance (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Equal variances assumed	2.731	238	.007	4.50	1.65	1.25	7.74

According to the above table, t =2.731 and P < 0.01 .Therefore ,there is a significant difference in the diastolic blood pressures of the two groups, at a confidence interval of 95%.

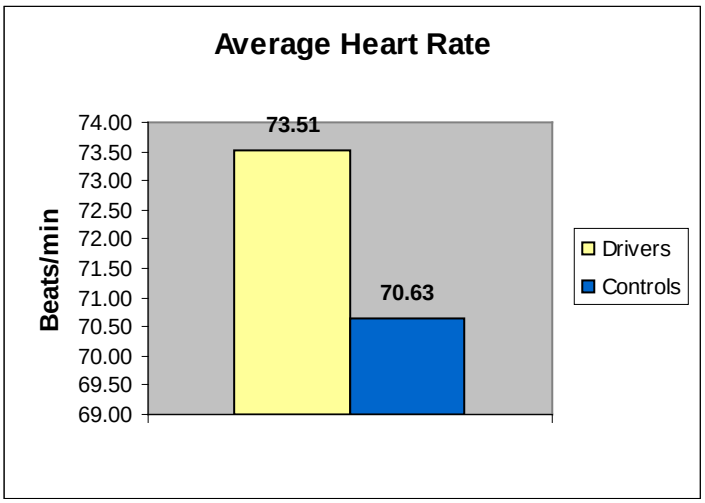

Fig 2: Mean heart rate in bus drivers and controls.

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Table 7: Mean Heart Rate in bus drivers and controls.

SUBJECT	Mean (mmHg)	N	Std. Deviation
Drivers	73.51	117	8.91
Controls	70.63	123	9.40
Total	72.04	240	9.26

The above table and graph shows that bus drivers have a higher average heart rate than the controls.

Table 8: Independent Samples t-Test for Heart Rate between bus drivers and controls

	t-test for Equality of Means						
	T	Degree of Freedom	Significance (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Equal variances assumed	2.433	238	.016	2.88	1.18	.55	5.21

According to the above table, t = 2.433 and P < 0.05.Therefore there is a significant difference in the heart rate between the two groups, at a confidence interval of 95%.

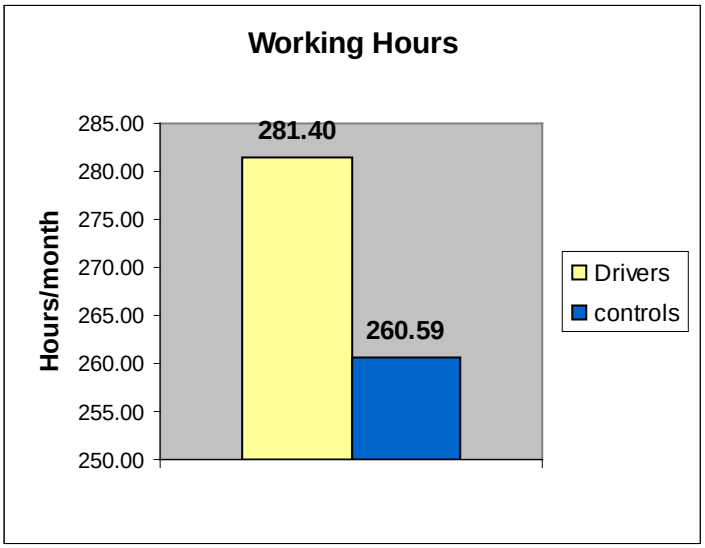

Fig.3: Average number of working hours in bus drivers and controls.

The above graph shows that bus drivers on average work more hours per month than controls

Table 9: Average number of Working Hours in bus drivers and controls

SUBJECT	Mean	N	Std. Deviation
Drivers	281.41	117	75.22
Controls	260.59	123	73.83
Total	270.74	240	75.08

The above graph(3) and table(9) show that bus drivers on average work more hours per month than controls

Table 10: Independent Samples t-Test for Working Hours between bus drivers and controls

	t-test for Equality of Means						
	T	Degree of Freedom	Significance (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Equal variances assumed	2.164	238	.031	20.82	9.62	1.87	39.78

According to the above table t = 2.164 and P<0.05. Therefore there is a significant difference in the average working hours between the two groups.

A **B**

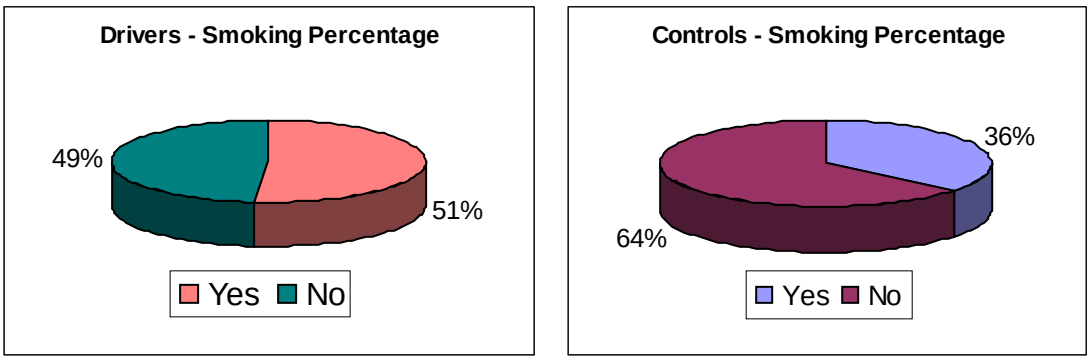

Fig. 4: The percentage of smokers and non-smokers among bus drivers (A) and controls (B).

The above charts show that the percentage of smokers is higher in the bus drivers (51%) compared to the control group (36%).

A **B**

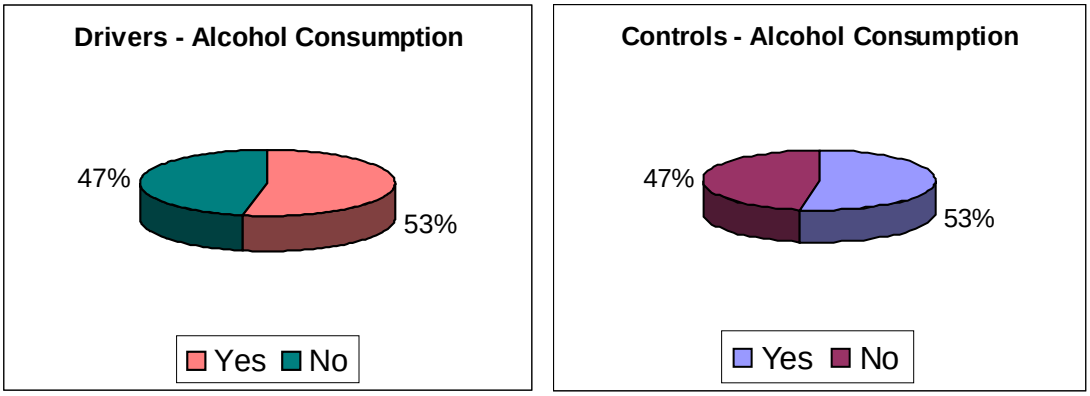

Fig.5: The percentage of alcohol consumption among bus drivers (A) and controls (B).

The above charts show that the percentage consuming alcohol is similar in both bus drivers (53%) and controls (53%).

A **B**

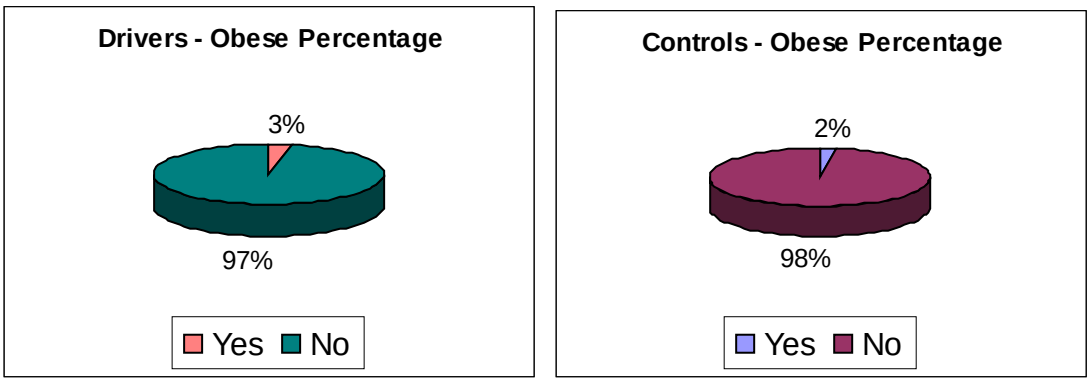

Fig.6: The obese percentages of drivers (A) and controls (B).

The above charts show that the obese percentage is higher in bus drivers (A) compared to controls (B).

A **B**

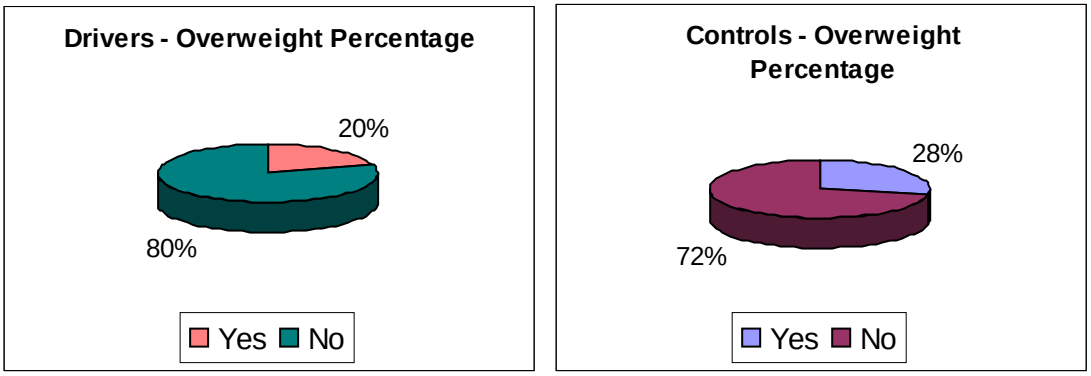

Fig.7: The overweight percentages of drivers (A) and controls (B).

The above charts show that the overweight percentage is higher in controls (B) compared to bus drivers (A).

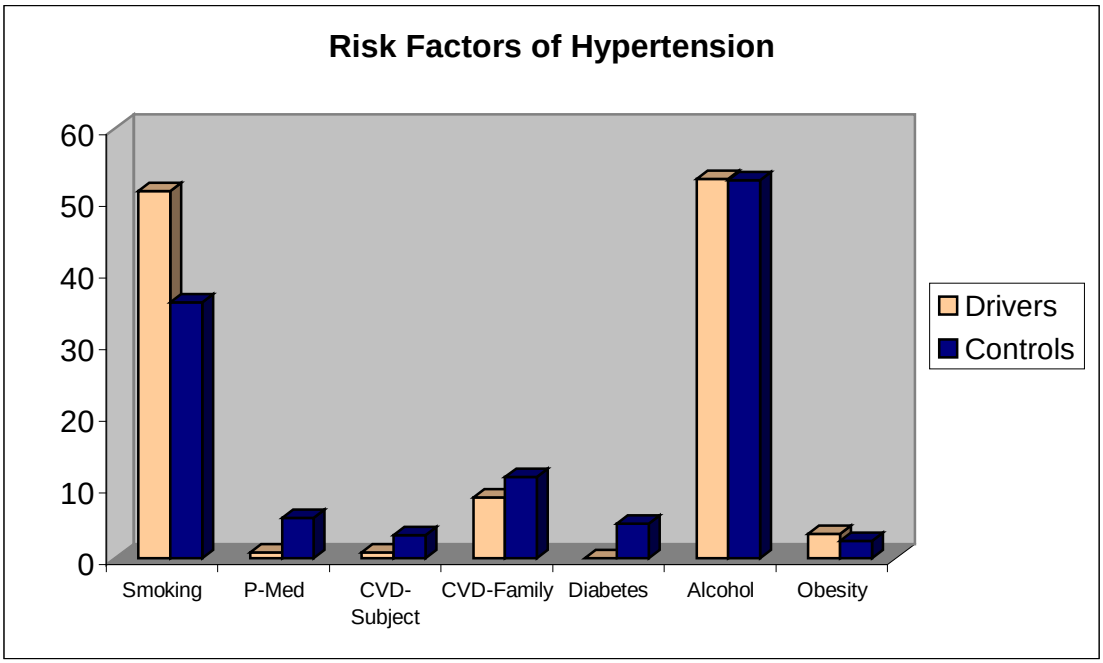

Fig. 8: The percentage among drivers and controls, exposed to risk factors such as smoking, alcohol consumption, obesity ,medication, history and family history of cardiovascular disease(CVD) and diabetes.

The above graph shows that the percentages of smokers and obese individuals were higher in drivers than controls .The percentage of subjects with a history of cardiovascular disease and diabetes was slightly higher in the controls. But there was no difference in the percentage of subjects consuming alcohol among bus drivers and controls.

7. Discussion

Proving our hypothesis correct, the mean arterial pressure of the bus drivers was found to be statistically higher than the control group. Average heart rate and average diastolic pressure were also statistically higher in bus drivers compared to the controls while the average systolic pressure was not significantly different. Therefore the increase in the mean arterial pressure could be due to the increased diastolic pressure.

When considering the risk factors, the percentage of smokers was considerably higher in the bus drivers compared to the controls. Also the number of working hours per month was statistically higher in the drivers. Therefore we can hypothesize that smoking and work stress could have caused the increased mean arterial pressure values in the bus drivers. This hypothesis is supported by several studies. (Whisnant, 1990 and Cordeiro, 1993)

The percentages having cardiovascular diseases and diabetes and a family history of these diseases and the percentage taking pressure medication were all higher in the control group compared to the drivers. The percentage of obese individuals was higher in the drivers. But the percentage differences in the above factors were small and also the overall percentage with positive results, as a whole was small. So these factors do not seem to have an effect on the mean arterial pressures.

Though a large percentage consumed alcohol in both groups, there was no difference between the two groups. Therefore the effect of alcohol consumption on the difference in the mean arterial pressures between the two groups seems to be minimal.

Zero percent prevalence of diabetes and also lower cardiovascular disease prevalence among the drivers can be due to actually, lack of awareness about these diseases. It is our view that basic health education programmes about these diseases and also about the negative effects of smoking ect may help them. A reduction in working hours per month may also help to reduce the occupation related stress of bus drivers.

8. Conclusions

From the results obtained we concluded that the mean arterial pressure of bus drivers is statistically higher compared to the control group and this may be due to the higher percentage of smokers among bus drivers and the higher number of working hours per month in bus drivers.

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10.

Appendix

DATA COLLECTION SHEET-- GROUP 17

Subject No :_____ (Driver/Control)

1. Age(yrs) :_____

2.Height (cm) :_____

Weight (kg) :_____

BMI (kg/m^2):_____

3.Alcohol: (Y/N)
The amount consumed per day?_____
How many days per week? _____

4.Smoking: (Y/N)
How many cigarettes per day? _____

5.Pressure medication: (Y/N)

6.CVD: Subject (Y/N)
Family (Y/N)

7.Diabetes: (Y/N)

8.Working hours per day? _____
Working days per week? _____
Working years (Drivers) _____

9.Destination/Occupation: _____
Distance: _____

10.BP (Sys/Dia) (mmHg) : _____
HR (bpm): _____

Data Collection - Drivers **Group 17**

Subject No.	Age (yrs)	Height (cm)	Weight (Kg)	BMI (Kg/m^2)	Blood Pressure		Mean Arterial Pressure (mmHg)	Heart Rate (bpm)	Alcohol con.	Smoking /day	P Med	CVD		Diabetes	Working hrs /mon	Distance Driven /day
					Systolic (mmHg)	Diastolic (mmHg)						Subject	Family			
001	47	159	51	20.17	138	96	110.00	82	Y	1	N	N	N	N	336	180
002	36	175	87	28.41	140	90	106.67	76	Y	0	N	N	N	N	308	150
003	49	168	72	25.51	142	98	112.67	81	N	0	N	N	N	N	288	150
004	49	161	53	20.45	146	100	115.33	78	Y	10	N	N	N	N	336	370
005	26	162	45	17.15	110	80	90.00	68	Y	8	N	N	N	N	288	104
006	58	160	57	22.27	150	100	116.67	70	Y	5	N	N	N	N	336	105
007	39	168	66	23.38	126	108	114.00	60	Y	6	N	N	N	N	224	155
008	34	173	82.5	27.57	128	100	109.33	65	N	0	N	N	N	N	280	147
010	44	169	80	28.01	130	100	110.00	64	N	2	N	N	Y	N	288	150
011	24	163	54	20.32	90	58	68.67	64	Y	8	N	N	N	N	336	78
012	33	162	49	18.67	100	80	86.67	80	N	6	N	N	N	N	336	52
013	26	166	65	23.59	110	60	76.67	60	N	0	N	N	N	N	448	117
014	35	162	62	23.62	138	96	110.00	72	Y	3	N	N	Y	N	288	117
015	30	167	65	23.31	120	90	100.00	90	N	5	N	N	N	N	224	117
016	35	167	72	25.82	130	100	110.00	60	N	0	N	N	N	N	96	144
017	50	171	73	24.96	140	110	120.00	80	Y	0	N	N	N	N	196	117
018	33	166	57	20.69	126	80	95.33	64	N	0	N	N	N	N	280	117
021	44	161.5	47	18.02	126	70	88.67	64	Y	4	Y	N	N	N	336	150
022	57	168	64	22.68	160	110	126.67	100	Y	0	N	N	N	N	240	90
023	31	168.5	50	17.61	120	56	77.33	80	Y	3	N	N	Y	N	312	80
024	32	167	73	26.18	118	90	99.33	62	N	0	N	N	N	N	308	120
025	23	165	64	23.51	128	90	102.67	64	N	0	N	N	N	N	216	120
026	35	169	50	17.51	106	70	82.00	60	N	0	N	N	N	N	336	150
027	48	163.5	68	25.44	120	74	89.33	60	Y	8	N	N	N	N	448	120
028	35	161.5	60	23.00	168	120	136.00	76	Y	5	N	N	Y	N	240	120
029	30	170	62.5	21.63	126	80	95.33	73	N	5	N	N	N	N	392	144
030	31	160	51.5	20.12	124	92	102.67	68	Y	10	N	N	N	N	392	144
031	29	173	85	28.40	152	104	120.00	82	N	0	N	N	N	N	264	144
032	29	164	63	23.42	148	82	104.00	84	N	0	N	N	N	N	264	144
033	40	165	60	22.04	120	86	97.33	74	N	0	N	N	N	N	264	144

034	34	165	67.5	24.79	158	118	131.33	72	Y	10	N	N	N	N	392	144
035	56	163	75	28.23	148	100	116.00	72	N	0	N	N	N	N	264	144
036	35	172	57	19.27	138	82	100.67	88	Y	0	N	N	N	N	288	84
037	30	180	57	17.59	120	80	93.33	68	Y	1	N	N	N	N	144	90
038	39	168	75	26.57	140	108	118.67	76	Y	10	N	N	N	N	144	120
040	29	160	52	20.31	116	92	100.00	64	N	0	N	N	N	N	504	144
041	26	165	56	20.57	116	80	92.00	78	N	0	N	N	Y	N	288	144
042	27	176	66	21.31	144	78	100.00	84	N	0	N	N	N	N	308	144
043	29	168	62.5	22.14	116	74	88.00	96	Y	7	N	N	N	N	140	144
044	35	157	43	17.44	122	96	104.67	84	Y	15	N	N	N	N	224	144
045	40	162	65	24.77	132	96	108.00	74	N	0	N	N	N	N	336	126
046	43	165	62	22.77	128	96	106.67	74	Y	15	N	N	N	N	392	144
047	28	168	58	20.55	122	88	99.33	60	Y	15	N	N	N	N	264	105
048	36	181	87.5	26.71	120	86	97.33	64	Y	10	N	N	N	N	392	144
049	47	178	87	27.46	138	84	102.00	78	N	9	N	N	Y	N	192	156
050	34	173	67	22.39	140	110	120.00	68	Y	5	N	N	N	N	420	138
051	35	157	55	22.31	136	88	104.00	62	N	0	N	N	N	N	192	65
052	39	162	81.5	31.05	124	78	93.33	62	N	0	N	N	N	N	195	78
053	43	164	57.5	21.38	140	98	112.00	75	Y	20	N	N	N	N	364	96
054	32	165	61	22.41	128	78	94.67	64	Y	4	N	N	N	N	392	96
055	47	170	65	22.49	144	98	113.33	82	Y	2	N	N	N	N	336	70
056	40	166	47	17.06	102	78	86.00	72	Y	10	N	N	N	N	420	230
057	49	173	73	24.39	138	106	116.67	64	Y	10	N	N	N	N	260	96
058	43	172	81	27.38	136	110	118.67	76	Y	5	N	N	N	N	336	96
059	46	157	58	23.53	138	96	110.00	76	N	0	N	N	N	N	336	96
060	46	170	82	28.37	120	90	100.00	65	N	0	N	N	N	N	392	96
061	35	165	55	20.20	120	92	101.33	78	N	0	N	N	N	N	364	125
062	39	169	54	18.91	138	100	112.67	72	Y	5	N	N	N	N	288	160
063	47	164	47.5	17.66	134	100	111.33	63	Y	3	N	N	N	N	168	130
065	29	166	60	21.77	134	100	111.33	80	N	0	N	N	N	N	144	64
066	30	175	53	17.31	110	90	96.67	83	N	5	N	N	N	N	224	350
067	30	168	66.5	23.56	130	110	116.67	72	N	0	N	N	N	N	288	144
068	26	167	70	25.10	130	100	110.00	80	N	0	N	N	N	N	144	144
069	54	155	57	23.73	120	84	96.00	78	Y	18	N	N	N	N	288	144
070	32	172	67	22.65	128	102	110.67	74	Y	10	N	N	N	N	280	192
071	33	175	57	18.61	118	90	99.33	76	N	0	N	N	N	N	168	112

072	34	161	83	32.02	114	78	90.00	72	N	0	N	N	N	N	224	56
073	54	175	62	20.24	98	68	78.00	72	N	20	N	N	N	N	288	144
074	27	164	75	27.89	120	86	97.33	86	Y	0	N	N	N	N	288	144
075	44	165	67	24.61	124	116	118.67	72	N	0	N	N	N	N	288	144
076	42	170	50	17.30	130	76	94.00	96	Y	6	N	N	N	N	288	144
077	30	174	61	20.15	122	82	95.33	74	N	0	N	N	N	N	288	144
078	32	162	72	27.43	110	80	90.00	74	N	0	N	N	N	N	196	64
079	52	164	77.5	28.81	140	100	113.33	91	N	0	N	N	N	N	144	80
080	26	165	63	23.14	118	78	91.33	74	N	0	N	N	N	N	252	112
081	37	165	86.5	31.77	126	96	106.00	76	N	0	N	N	N	N	288	144
082	31	160	78	30.47	118	78	91.33	80	N	10	N	N	N	N	288	144
083	48	166	75	27.22	130	100	110.00	60	Y	0	N	N	N	N	120	64
084	40	163	51	19.20	104	78	86.67	86	Y	12	N	N	N	N	288	144
085	46	171	68	23.26	154	96	115.33	79	Y	20	N	N	N	N	288	144
086	36	158	50	20.03	110	76	87.33	76	Y	20	N	N	N	N	240	144
087	36	165	63	23.14	122	96	104.67	74	N	0	N	N	N	N	240	144
088	37	168	63	22.32	126	80	95.33	80	Y	0	N	N	N	N	240	144
089	42	155	62.5	26.01	122	90	100.67	70	Y	15	N	N	N	N	288	144
090	34	165	54	19.83	112	76	88.00	84	Y	6	N	N	N	N	288	144
091	35	174	67.5	22.29	110	92	98.00	68	N	0	N	N	N	N	288	144
092	26	170	56	19.38	112	86	94.67	76	Y	5	N	N	N	N	288	144
093	26	162	76	28.96	128	92	104.00	80	N	20	N	N	N	N	288	144
094	39	167	63	22.59	120	80	93.33	76	N	6	N	N	N	N	288	144
095	41	172	53	17.92	108	82	90.67	80	Y	0	N	N	N	N	336	154.4
096	32	166	67.5	24.50	120	80	93.33	76	N	2	N	N	Y	N	336	140
097	48	165	52.5	19.28	132	100	110.67	60	Y	0	N	N	Y	N	312	128
098	34	161	50	19.29	138	100	112.67	76	Y	0	N	N	Y	N	216	196
099	45	166	58	21.05	112	82	92.00	80	N	0	N	N	N	N	260	195
100	39	163	57	21.45	114	74	87.33	60	N	3	N	N	N	N	336	120
101	45	173	56	18.71	110	74	86.00	88	N	0	N	N	N	N	336	180
102	39	167	62.5	22.41	158	110	126.00	64	Y	5	N	N	Y	N	336	84
103	51	163	52.5	19.76	144	90	108.00	70	N	0	N	N	N	N	280	97.5
104	52	170	73	25.26	144	100	114.67	80	N	5	N	N	N	N	324	54.6
105	42	159	52	20.57	154	108	123.33	78	Y	3	N	N	N	N	336	90
106	42	167	55	19.72	136	80	98.67	80	Y	0	N	N	N	N	392	150
107	41	162	56	21.34	124	78	93.33	60	Y	8	N	N	N	N	180	182.5

108	40	166	55	19.96	138	82	100.67	70	Y	0	N	Y	N	N	240	72
109	54	166	52	18.87	138	112	120.67	74	N	0	N	N	N	N	210	294
110	50	182	62	18.72	124	82	96.00	64	N	2	N	N	N	N	196	90
111	42	165	62	22.77	100	68	78.67	68	Y	2	N	N	N	N	168	130
112	32	165	70	25.71	126	82	96.67	76	Y	2	N	N	N	N	336	256
113	37	165	50	18.37	134	100	111.33	72	Y	0	N	N	N	N	196	50
114	49	165	66	24.24	108	68	81.33	90	Y	2	N	N	N	N	364	200
115	40	163	58	21.83	130	90	103.33	66	Y	0	N	N	N	N	240	198
116	35	160	53	20.70	122	78	92.67	64	Y	5	N	N	N	N	288	90
117	42	166	60	21.77	134	94	107.33	66	Y	0	N	N	N	N	216	96
118	54	160	57.5	22.46	120	80	93.33	68	Y	0	N	N	N	N	280	150
119	33	162	50	19.05	110	78	88.67	64	N	0	N	N	N	N	280	272
120	36	162	54	20.58	108	80	89.33	86	N	0	N	N	N	N	308	147
121	36	163	62	23.34	98	60	72.67	62	N	0	N	N	N	N	196	230
122	37	165	47.5	17.45	110	82	91.33	68	Y	3	N	N	N	N	280	120