

Relationship between risk factors and hypertension Riyadh-Saudi Arabia

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Abstract: hypertension is persistent elevation of blood hypertension is important to study because it is one of the leading causes of mortality in the world. This study is to find out the relationship between risk factors such as age, obesity, gender, genetics, stress, physical activity, salt, smoking and primary hypertension.

Method: A case – control study was conducted on risk factors of hypertension .A questionnaires was designed to collect data 60 patients, 30 cases, 30 control in Almubarak hospital during the period of May 11 2014 to May 15 2014.

Result: it was found that 43.3% out of 30 cases were obese; while, it was found that 16.7 % of controls were obese. This difference was statistical significant ($p=0.0242$) of the cases. And 77% were overweight and obese compared to 33% of controls. This difference was also statistical significance ($p=0.0007$). In addition, it was found that 56.6 % of cases were nonsmokers, while 40 % of controls were nonsmoker; this difference was statically significance ($p=0.0013$) of cases 43% were smokers compared to 83 % of controls.

Conclusion: in conclusion form the study, people who are overweight, obese and smoker they have major risk factor of hypertension.

Keywords: hypertension, risk factors , smoking, weight, age.

1. INTRODUCTION

Hypertension in defined as persistent elevation of blood pressure exceeding one hundred forty over ninety mmHg.¹ This subject is very important to the society as it is one of the leading causes of mortality in the world. Hypertension is a major risk factor for stroke and other cardiovascular, ischemic heart disease, myocardial infarction and heart failure. Increased systemic vascular resistance, increased vascular stiffness, and increased vascular responsiveness to stimuli are central to the pathophysiology of hypertension. Hypertension is classified as either primary (essential) hypertension or secondary hypertension; about 90–95% of cases are categorized as "primary hypertension" which means high blood pressure with no obvious underlying medical cause. The remaining 5–10% of cases (secondary hypertension) are caused by other conditions that affect the kidneys, arteries, heart or endocrine system. High blood pressure is the second-leading cause of end-stage renal disease, and its presence increases the rate of progression of all kidney diseases.²

The aims of this study is find out the relationship between risk factors such as age, obesity, gender, genetics, stress, physical activity, high sodium intake (salt), smoking and primary hypertension.

2. REVIEW OF LITERATURE

A Study in Boston, in 2009, addressed diet and lifestyle as risk factors associated with Incident hypertension in women. It included 116 430 women. They found that all 6 modifiable risk factors were independently associated with the risk of developing hypertension during follow-up. They concluded that adherence to low-risk dietary and lifestyle factors was associated with a significantly lower incidence of self-reported hypertension and prevented of a large proportion of new onset hypertension occurring among young women.³

Another research was conducted in Colombo in 2009. That study was about prevalence and risk factors for resistant hypertension among hypertensive patients from a developing country. It included 277 patients. They found that the resistant hypertension represents a different phenotype to the general population and it was reasonable to assume that genetic factors played a greater role in pathogenesis. They concluded that nearly one fifth of the population was suffering from resistant hypertension, which was significantly associated with the presence of obesity and diabetes mellitus.⁴

A Prospective study was carried out in Boston in (1990 to 2003). It investigated habitual caffeine intake and the risk of hypertension in women. Including 155 594 US women. They found that there was no relation between caffeine intake and the risk of Physician-diagnosed hypertension. They concluded that the consumption of coffee in women does not appear to increase the risk of developing hypertension.⁵

A research was carried in Chiba, Japan in 2009. Addressing smoking as an independent risk factor for hypertension. It included 8251 workers. They found that smoking was an independent and significantly associated factor with the onset of hypertension and systolic hypertension. The results of that study also suggested that smoking affects systolic blood pressure more than diastolic blood pressure. They concluded that smoking is independently associated with the onset of hypertension and systolic hypertension.⁶

The American medical association published a study using multivariable-adjusted models on systolic pressure, but not diastolic pressure. It was positively and independently correlated with the 24-hours urinary sodium excretion. This correlation was present at baseline and follow-up in the whole study population. They concluded that in this population-based cohort, systolic blood pressure, changes over time aligned with change in sodium excretion, but this association did not translate into a higher risk of hypertension or cardiovascular disease complications. Lower sodium excretion was associated with higher cardiovascular disease mortality.⁷

A population based community survey involving 1475 persons aged between 25 and 74 Years was conducted in Cuba in 2007. That study addressed risk factors associated with uncontrolled hypertension. They found that while half of women with hypertension were controlled, only one third of men were receiving successful treatment. Gender differences were not seen, however, among those currently taking medications. The largest burden of hypertension in absolute terms was concentrated in the age range between 45 and 64. They concluded that in spite of universal access to health and drug services, a significant proportion of patients did not meet their target for blood pressure control.⁸

A case control study was taken in Gaza, in Jan 2013. That study investigated the risk factors of hypertension at united nations relief and works agency (UNRWA) primary health care centers. That study supports intervention polices to minimize the disease morbidity and mortality, and by establishing baseline information for hypertension risk factors among Palestinians. A proportional systemic random sample of 120 cases matched with sex, and locality to 120 controls were chosen. That study concluded that hypertension considered as the leading cause of death among adults in Palestine, exactly as it is in the whole world.⁹

3. METHODOLOGY

Study design: case control.

Study area: AL Mubarak hospital, King Faisal Street, Riyadh, outpatient department.

Definition of case: a case is a hypertensive patient diagnosed and followed up in Almubarak hospital as indicated in patent life for at least 6 months.

Definition of control: are patients or companions of patient not suffering from hypertension or diabetes in the same hospital.

Time of study: From 11\5\2014 to 15\5\2014

Sample: Convenient sample of method was used so that the first 30 who satisfied ‘‘case’’ criteria were taken as case. Likewise, the first 30 who satisfied control criteria were taken as control.

Tool: Questionnaire

Methods of data collection: the data will be gathered by interview using a specially designed questionnaire, which include close end questions. It covered personal information or risk factor associated with hypertension.

Analyzing: After data collecting and excluding unclear and incomplete questionnaire, coding, entry was done, and analyzed using SPSS.

4. RESULTS

This case control study on hypertension in viewed 30 cases and 30 controls.

It was found that 63.3% of cases of hypertension were equal or above 40 years of age, while 46.6% controls were equal or above 40 years of age. This difference in age distribution between cases and controls did not reach statistical significance. (table 1)

Females constituted 50 % of cases, and 27 % of controls were female. This difference was not statistical significance. (table 2)

It was found that 23% of cases were having stressful jobs, while 13 % of controls were having stressful jobs.This difference in jobs distribution between cases and controls did not reach statistical significance. (table 3)

Family history of hypertension among fathers was positive in 53 % of cases compared to 57% of controls. This difference was not statistical significance. (table 4)

It was found that 66.7% out of 30 patients suffer from hypertension were having changes in their weight, over while 53 % of controls patients were having changes in their weight. No association was found between weight change and hypertension. (table 5)

It was noticed that 43.3% out of 30 patients suffering from hypertension were obese, on the other hand it was found that 16.7 % of controls were obese. This difference was statistical significant (p=0.0242) of the cases. 77% were overweight and obese compared to 33% of controls. This difference was also statistical significance (p=0.0007). (table 6)

According to the collected data it was found that 56.6 % of causes were non smokers , while 40 % of cases were non smoker, this difference was statically significance (p=0.0013) of cases 43% were smokers compared to 83 % of controls. This difference was also statistical significance. (table 7)

It was found that 83.3% of cases were sleeping more than 6 hours a day, and 76.6 % of control were sleeping more than 6 hours a day. this difference was not statistical significance. (table 8)

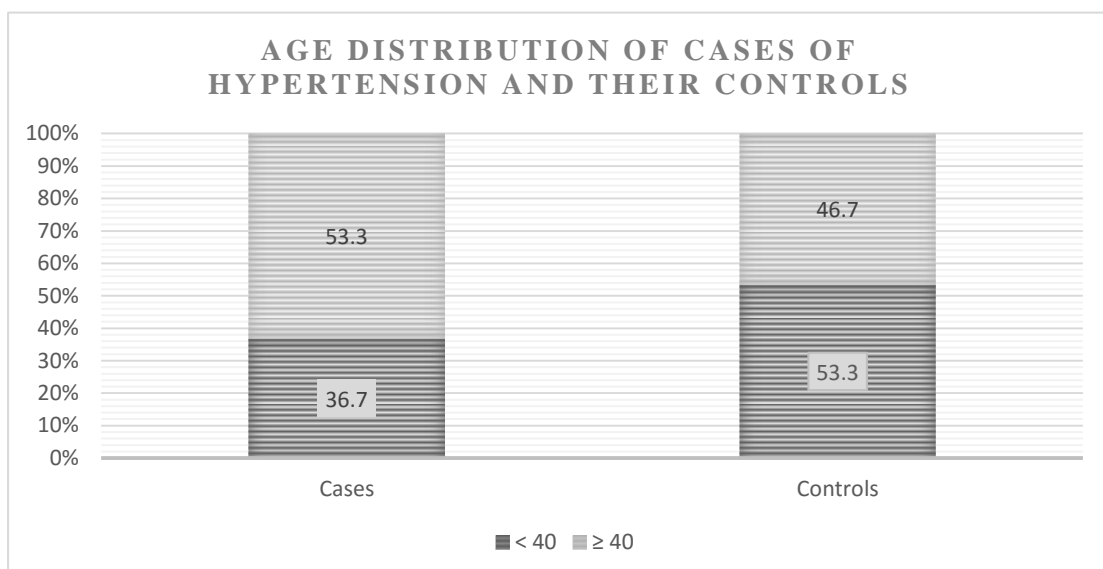
It was noticed that 63.3 % of cases were not exercising at least half an hour, 3 times a week, while 56.6% of controls were also not exercising. this difference was not statistical significant. (table 9)

It was noticed that 56.6% of cases were having normal salt in their food, while 70% of control were also having normal salt in their food. this difference was not statistical significant. (table 10)

Tables 1: Age distribution of cases of hypertension and their controls

Age (years)	Cases	Controls	Total
< 40	11 (36.7%)	16 (53.3%)	27
≥ 40	16 (53.3%)	14 (46.7%)	33
Total	30	30	60

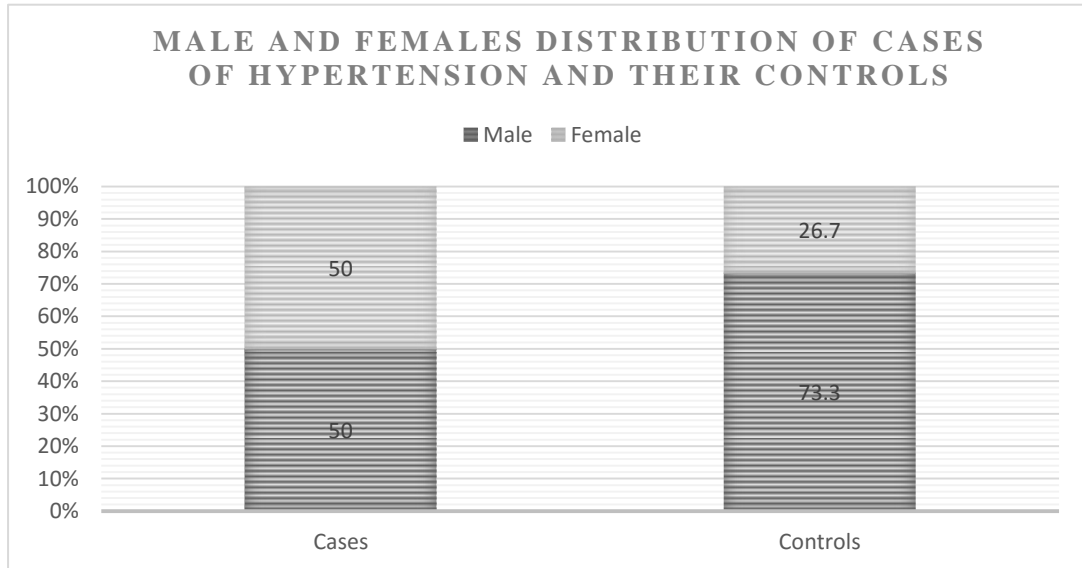
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Tables 2: Male and female distribution of cases of hypertension and their controls

Gender	Cases	Controls	Total
Male	15 (50%)	22 (73.3%)	37
Female	15 (50%)	8 (26.7%)	23
Total	30	30	60

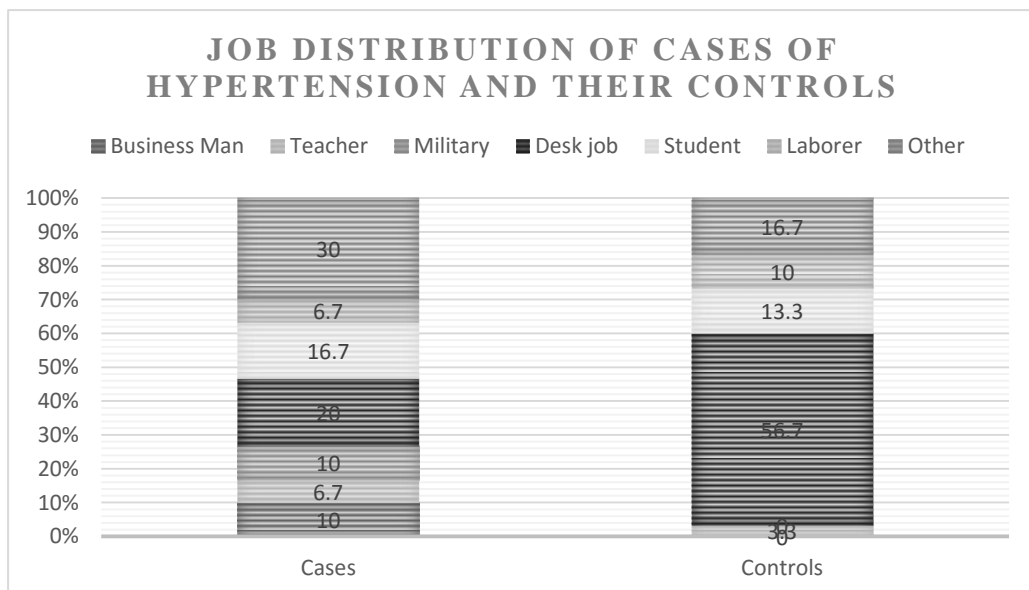
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Tables 3: Job distribution of cases of hypertension and their controls

Job	Cases	Controls	Total
Business Man	3 (10%)	0 (0%)	3
Teacher	2 (6.7%)	1 (3.3%)	3
Military	3 (10%)	0 (0%)	3
Desk job	6 (20%)	17 (56.7%)	23
Student	5 (16.7%)	4 (13.3%)	9
Laborer	2 (6.7%)	3 (10%)	5
Other	9 (30%)	5 (16.7%)	14
Total	30	30	60

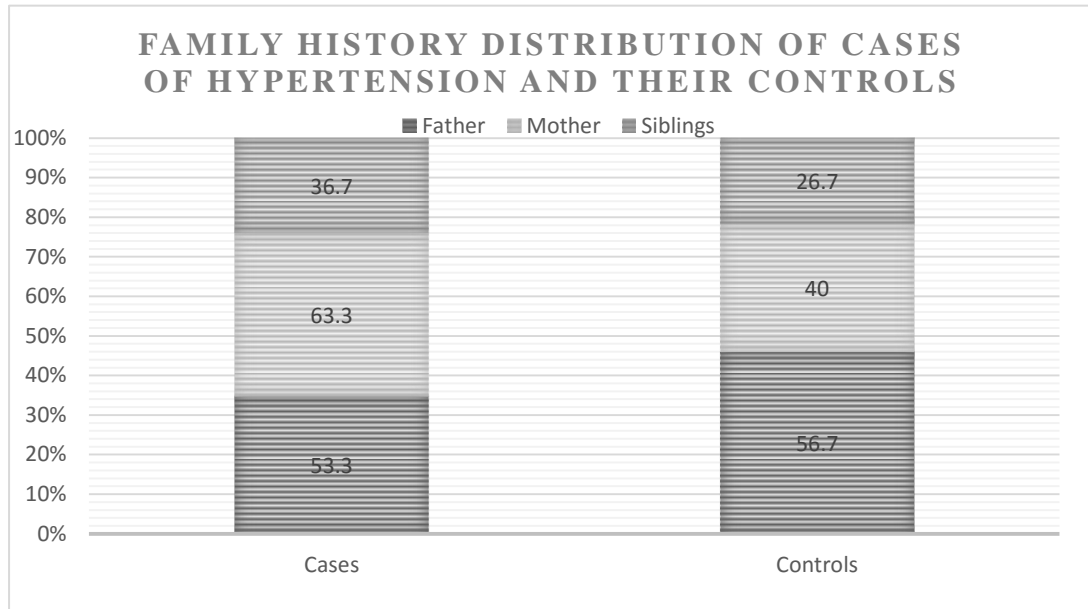
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Tables 4: Family history distribution of cases of hypertension and their controls

Family History	Cases	Controls	Total
Father	16 (53.3%)	17 (56.7%)	33
Mother	19 (63.3%)	12 (40%)	31
Siblings	11 (36.7%)	8 (26.7%)	19

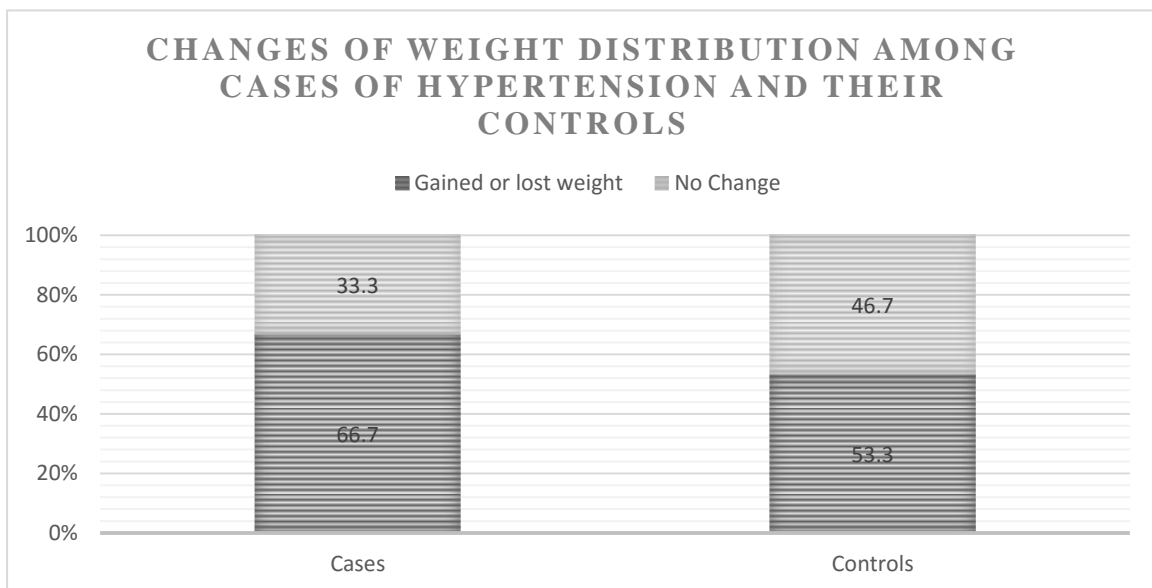
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Tables 5: Changes of weight distribution among cases of hypertension and their controls

Weight change	Cases	Controls	Total
Gained or lost weight	20 (66.7%)	16 (53.3%)	36
No Change	10 (33.3%)	14 (46.7%)	24
Total	30	30	60

(ALMobark Hospital, Riyadh, May 2014)



Tables 6: Body mass index distribution of cases of hypertension and their controls

BMI	Cases	Controls	Total
Under weight	0 (0%)	2 (6.7%)	2
Normal	7 (23.3%)	18 (60%)	25
Over weight	10 (33.3%)	5 (16.7%)	15
Obese	13 (43.3%)	5 (16.7%)	18
Total	30	30	60

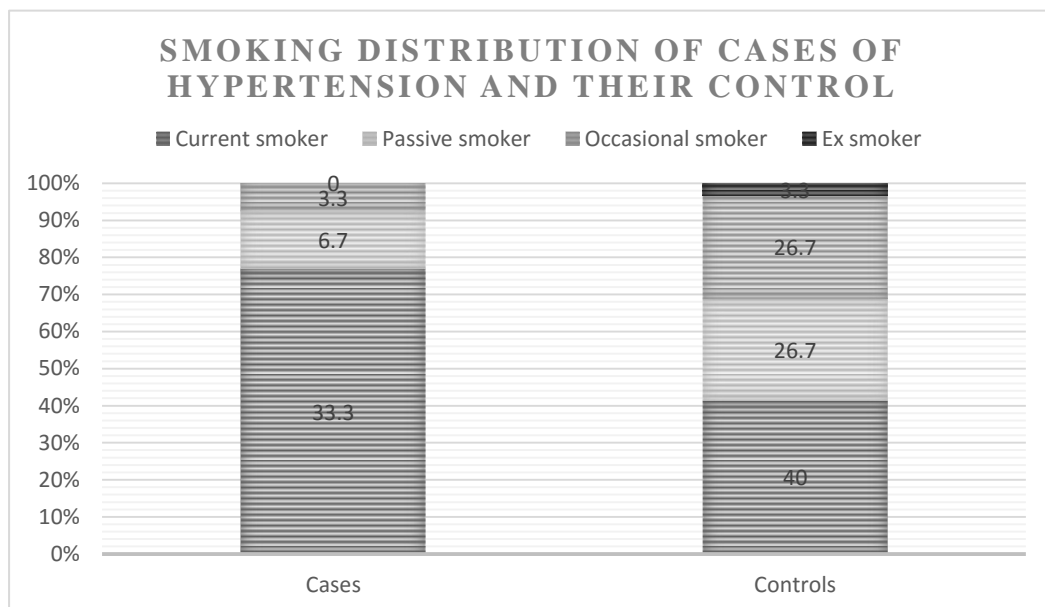
(ALMobark Hospital, Riyadh, May 2014)



Tables 7: Smoking distribution of cases of hypertension and their control

Smoking Status	Cases	Controls	Total
Current smoker	10 (33.3%)	12 (40%)	22
Passive smoker	2 (6.7%)	8 (26.7%)	10
Occasional smoker	1 (3.3%)	2 (6.7%)	3
Ex smoker	0 (0%)	3 (3.3%)	3
Non smoker	17 (56.7%)	5 (16.7%)	22
Total	30	30	60

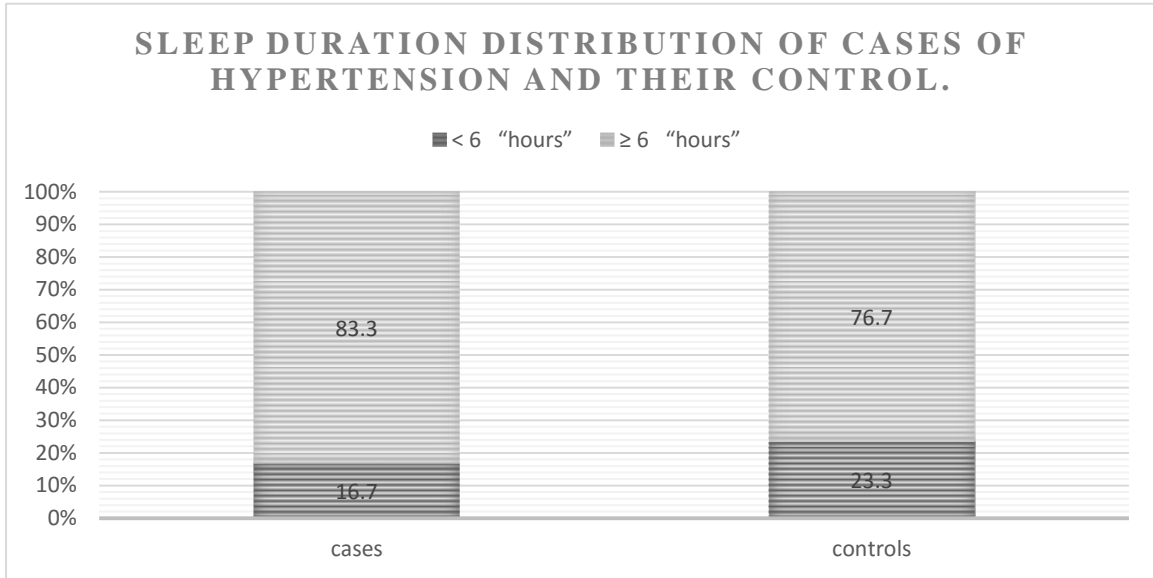
(ALMobark Hospital, Riyadh, May 2014)



Tables 8: Sleep duration distribution of cases of hypertension and their control

Duration of sleep	cases	controls	Total
< 6 “hours”	5 (16.7%)	7 (23.3%)	12
≥ 6 “hours”	25 (83.3%)	23 (76.7%)	48
Total	30	30	60

(ALMobark Hospital, Riyadh, May 2014)

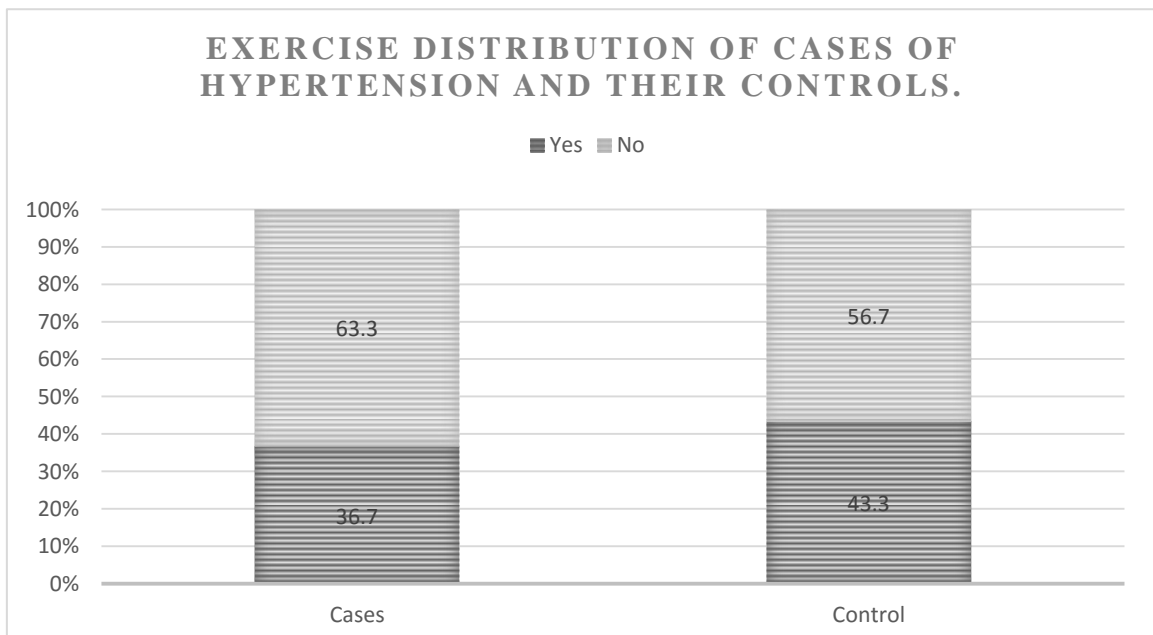


Tables 9: Exercise distribution of cases of hypertension and their controls

> 1/2 hour, 3 times a week

Exercise	Cases	Control	Total
Yes	11 (36.7%)	13 (43.3%)	24
No	19 (63.3%)	17 (56.7%)	63
Total	30	30	60

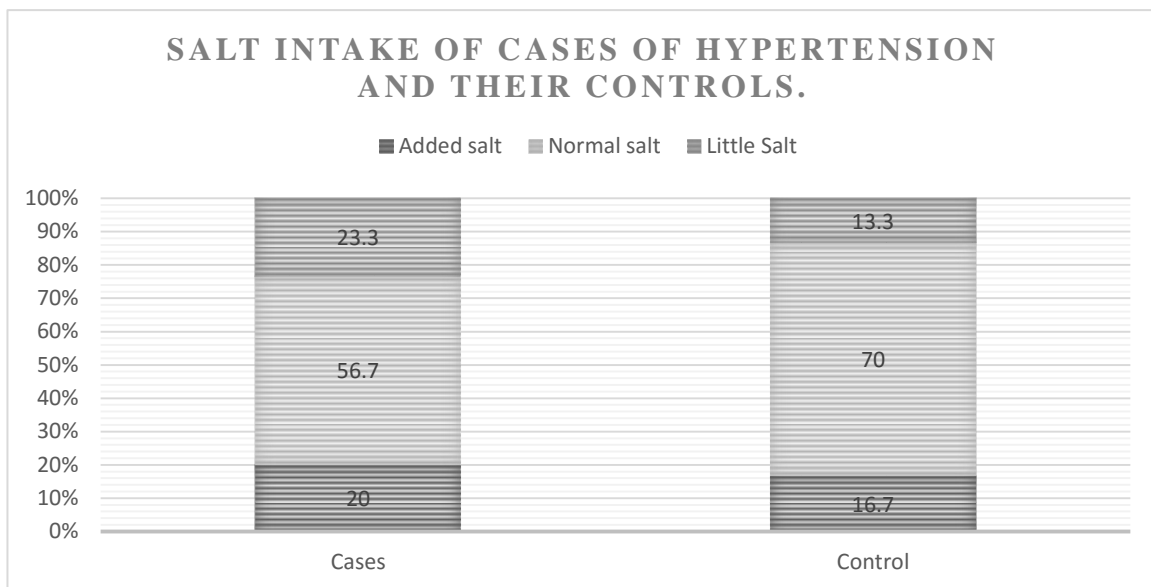
(ALMobark Hospital, Riyadh, May 2014)



Tables 10: Salt intake of cases of hypertension and their controls

Salt consumption	Cases	Control	Total
Added salt	6 (20%)	5 (16.7%)	11
Normal salt	17 (56.7%)	21 (70%)	38
Little Salt	7 (23.3%)	4 (13.3%)	11
Total	30	30	60

(ALMobark Hospital, Riyadh, May 2014)



5. DISCUSSION

In this study, age was not associated with hypertension. In general, age plays major role in increase blood pressure because in aging there is loss of visco-elastic properties of vessels, increase atherosclerosis arterial diseases and hypertrophy of muscular artery.¹⁰

In this study gender was not associated with hypertension, there is small difference between male and female in development in hypertension. Stressful jobs were not associated with hypertension. In job distribution, it was found that there is stressful and unstressed jobs. For example, business men, teachers and laborers were stressful, but military, desk job and student were unstressed jobs. One of the factors affecting blood pressure through stress is job strain. Stress is related to hypertension through repeated blood pressure elevations. The body produces a surge of hormones when the persons in a stressful situation. These hormones temporarily increase blood pressure by causing tachycardia and the blood vessels to narrow. However, doing activities to reduce blood pressure, such as exercising 30 to 60 minutes a day can reduce stress level. Taking breaks during work hours can help to manage the stress, and improve the human health can make a long term difference in lowering blood pressure.¹¹

In this study positive father, mother and sibling family history was not associated with hypertension. In this case there is mutable gens defect can cause mend line forms of high blood pressure almost 10 gens can cause hypertension these mutations can alter renal salt handling leading to hypertension. Another study proves monogenic cause of hypertension is genetic alteration in activation of epithelial sodium channel result inappropriate sodium retention in collecting duct level. There gens involving the renin and angiotensin will lead to problem in specific enzyme channel and receptor implicating sodium handling in hormone disturbance. In father, mother and sibling they can't control their gens but they are in control what to do with them.¹²

In this study, change of weight was not associated with hypertension. Among cases there was some patients with change of weight after diagnosed with hypertension as a management for their condition because increase in weight could lead to increase in fatty tissue that increases their vascular resistance and in turn increases the work of the heart and it has to do to pump blood throughout the body and worsening their conditions. We should advise any hypertensive patients to monitor his weight carefully and exercise regularly.¹³

In this study, obesity as measured by BMI was statistically, significantly associated with hypertension. This was also reported in the study that addressed diet and lifestyle as risk factors associated with incident hypertension in women research.³ This was expected because obesity has many damaging effects on physiological processes. Obesity and hypertension are linked, with obese patients having higher rates of hypertension than normal-weight individuals. Interestingly, not every obese patient is hypertensive, indicating that obesity is a heterogeneous condition.¹⁴

Regarding this study, smoking was statistically, significantly related to hypertension. It was also reported that smoking is an independent risk factor for hypertension.⁶ This was expected because smoking causes an acute increase in blood pressure and heart rate and has been found to be associated with malignant hypertension. Nicotine acts as an adrenergic agonist, mediating local and systemic catecholamine release and possibly the release of vasopressin.¹⁵

According to this study, duration of sleep was not associated with hypertension. This survey shows that patients with short sleep duration are associated with increased blood pressure and increased risk of hypertension. This association might be related to inappropriate arousal due to an over activation of stress system. Patients that have high risk of hypertension should not sleep less than 7 hours.¹⁶

According to this study exercise was not associated with hypertension. This was also reported in the study that addressed diet and lifestyle as risk factors associated with incident hypertension in women research. This is expected because exercise may reverse the adverse effects of lack of activity. Many controlled studies have shown that exercise lowers systolic/diastolic blood pressure by at least 10/5 mmHg. Exercise not only improves blood pressure, but also attenuates other risk factors for cardiovascular complications. Exercise is a very healthy habit and patients with hypertension should consider exercising frequently.¹⁷

According to this study the pattern of salt intake was associated with hypertension. This was also reported by the University of Mississippi Medical Center. The survey found that sodium loading is associated with increase in blood pressure. Peripheral tissue vasculature responds by activating auto regulatory vasoconstriction that result in increased peripheral resistance. Patients with hypertension should be advised to decrease their salt intake.¹⁸

6. CONCLUSION

The conclusion is that smoking increases heart rate and causes hypertension. People who are obese tend to have higher risk of getting hypertension, also people with overweight BMI could turn to obese and get a risk of high blood pressure.

7. RECOMMENDATION

- Measures should be taken to prevent obesity and overweight by change their diet and perform
- Exercise frequently to decrease their weight.
- Smoking is major risk, so they must stop smoking immediately and attend a smoke prevention program.

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