International Journal of Innovative Research in Medical Science (IJIRMS)
Volume 02 Issue 03 March 2017, ISSN No. – 2455-8737
Available online at - www.ijirms.in

Open Access Journal | Research Article | DOI: 10.23958/ijirms/vol02-i03/08

# Kingdom of Saudi Arabia

# Najran University College of Medicine

# Batch 3

# Assessment of Risk Factors in Atherosclerotic Saudi Patients above 40 Year Old in King Khalid Hospital in Najran

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A research report submitted for research project

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DOI: 10.23958/ijirms/vol02-i03/08

# Dedication

The research paper is lovingly dedicated to our respective parents who have been our constant source of inspiration and perseverance, a desire for a happier tomorrow, and a better future.

My brothers… who participation rigors of research , and concerns strenuous , and have enjoyed their love , and their giving sincere, often extended care and their sincere , as long as prepare me a quiet life reassuring , and the atmosphere is scientifically appropriate , which motivated me and encouraged me , to move forward in the study , and scientific research continued .

I dedicate my first of a purely scientific them with love and pride, loyalty and gratitude. God made them me help and attributed the softest between and flanks, and made me worthy of their love; good they think, and Gallic confidence that keen on them, and I cherish at the same time.


DOI: 10.23958/ijirms/vol02-i03/08

# Acknowledgement

First of all praise to **Allah**, the most kind and most merciful, for completing this work and for the chance I had to go through this work with the supervision of my dear and great professors.

My deepest thanks and gratitude are to be presented to **Dr. Moawia - Alshiek** head department of family and community medicine for help me search for teaching writing.

I would like to express my deepest gratitude, grateful and almost respect to, **Dr. Osama Osman Badawy M.D**. Cardiology for the supervisor on research.

My heart is grateful to my father, mother and brother, for their encouragement, support and help given throughout the work.

Last, my deep thanks and best wishes for any person that help and encourage me to do this study.


DOI: 10.23958/ijirms/vol02-i03/08

# Table of content




DOI: 10.23958/ijirms/vol02-i03/08

# List of Tables




DOI: 10.23958/ijirms/vol02-i03/08

# List of Figures:




DOI: 10.23958/ijirms/vol02-i03/08

# List of Abbreviation:

| Complete | Abbreviation name |
|---|---|
| CAD | Chronic obstructive pulmonary disease |
| PAD | Peripheral artery disease |
| CAD | Coronary artery disease |
| RAD | Renal artery disease |
| ABI | Ankle brachial index |
| CABG | Coronary artery By bass graft |
| LDL | Low density lipoprotein |
| HDL | High density lipoprotein |
| ACS | Acute coronary syndrome |
| AMI | Acute myocardial infarction |
| IMT | intimal medial thickness |


DOI: 10.23958/ijirms/vol02-i03/08

***Abstract:***

*Atherosclerosis is a disease in which plaque builds up inside arteries. Plaque is made up of fat, cholesterol, calcium, and other substances found in the blood. Over time, plaque hardens and enlarge. This limits the flow of oxygen-rich blood to organs supplied by the affected artery. Atherosclerosis can affect any artery in the body, including arteries in the heart, brain, arms, legs, pelvis, and kidneys. As a result, different diseases may develop based on which arteries are affected.*

*The cause of atherosclerosis isn't known. However, certain traits, conditions, or habits may raise risk for the disease. These conditions are known as risk factors such as smoking, age, gender…etc. A facility- based descriptive case series study will be conducted in King Khalid Hospital in Najran City to assess risk factors in atherosclerotic Saudi Patients above 40 years old. Case series and selective sampling techniques will be used for the selection of 50 atherosclerotic Saudi Patients above 40 years old.*

*The data will be collected by structural interview (check-list). Data processing and analysis will be done by entering the data into SPSS for Windows*[7].

*My results show that most age group affected by atherosclerosis are from 60-69, also patients effected by atherosclerosis have no dyslipidemia about 64%. Patients affected by atherosclerosis are diabetes about 65.31%, while we found the duration of diabetes in most atherosclerotic Saudi patients from (6-10 years), (16-10 years) about 29.1%. But patients with atherosclerosis have no stroke 74%.*

*The patients with atherosclerosis are not smoker about 90%. Most atherosclerotic Saudi patients with diabetes are male about 51.02%., also most atherosclerotic Saudi patients with hypertension are male about 48%. Atherosclerotic Saudi patients with obesity are female about 22%.*

*The most atherosclerotic Saudi patients with dyslipidemia are female about 26%, and the atherosclerotic Saudi patients with stroke are from age 60-69 years old. The atherosclerotic Saudi patients are somker from age 60-79 years old.*


DOI: 10.23958/ijirms/vol02-i03/08

# Chapter (1)

## Introduction:

### 1.1Definition:

Atherosclerosis is a disease in which plaque builds up inside arteries. Plaque is made up of fat, cholesterol, calcium, and other substances found in the blood. Over time, plaque hardens and enlarge. This limits the flow of oxygen-rich blood to organs and other parts of body.(1)

One other hand, Atherosclerosis is a systemic disease of the large and medium-sized arteries causing luminal narrowing (focal or diffuse) as a result of the accumulation of lipid and fibrous material between the intimal and medial layers of the vessel.(2)

### 1.2 Statement and Analysis:

Atherosclerosis can affect any artery in the body, including arteries in the heart, brain, arms, legs, pelvis, and kidneys. As a result, different diseases may develop based on which arteries are affected. Atherosclerosis begins with changes in endothelial cell function that cause white blood cells moving through the blood to stick to the endothelium (inner arterial wall) instead of flowing by normally.

High blood pressure, elevated LDL-cholesterol-triglycerides, low HDL, smoking, diabetes, obesity, and lack of exercise contribute to endothelial dysfunction and the subsequent development of atherosclerosis. Other significant artery-damaging factors are high levels of glucose, insulin, iron, homocysteine, and fibrinogen, and level of C-reactive protein that is higher than optimal. Homocysteine can induce the initial injury to the endothelium, then facilitate the oxidation of LDL that accumulate beneath the damaged endothelium, and finally contribute to the abnormal accumulation of blood components.

**Age:**

Atherosclerosis and age are intimately linked, atherosclerosis being the best example of an age related disease. With advanced age atherosclerosis become progressively more prevalent and more severe and is universally present in older human.

Its effects on the coronary, cerebral, peripheral artery and the aorta which result in heart disease, stroke, and multi infected dementia, peripheral Ischemia with gangrene and amputation, and aortic aneurism are the most important cause of disease and disability in old age. Thus, the control of atherosclerosis would make a major impact on the health of older people.(5)

The exact relationship between ageing and atherosclerosis is difficult to define. On the one hand, there may be a biological process of aging which is in some way related to pathogenesis of atherosclerosis.

On the other hand atherogenesis may be time related rather than age related; in other words, the relationship between age and atherosclerosis may simply be the time required for its development.

Strehelr has suggest that true ageing process should fulfill four characteristics: it should be universal, intrinsic, progressive and decremented.

Atherosclerosis clearly fulfill of these three criteria - it is universal in old age groups, progressive and decremented. The only question is whether atherosclerosis is an intrinsic condition.

It may clearly be influenced and modified by extrinsic factors but its universality in the older population would suggest that there is at least a strong intrinsic component to its pathogenesis.(5)

**Gender:**

Gender-related differences in the risk for cardiovascular disease. Peripheral artery disease (PAD) is cited historically as more prevalent in men overall compared with women. However, the population-based prevalence of PAD in women has not been fully evaluated.

In population studies, the prevalence of PAD in women is at least as high as that of men across all age groups, but increases to a greater extent in women after age 70 compared with men of the same age.

One study of 847,982 postmenopausal women found that in spite of an increased prevalence of several atherosclerotic risk factors among women who used hormone replacement therapy, they were significantly less likely to have PAD (3.3 versus 4.1 percent).(2)

**Smoking:**

Cigarette smoking correlates significantly with cardiovascular disease. The mechanism by which cigarette smoke promotes the development and progression of atherosclerosis is not clearly understood, but its effects include endothelial damage, arterial smooth muscle proliferation, thrombophilia, inflammation, increased sympathetic tone and other metabolic abnormalities.

The risk for peripheral artery disease (PAD) was increased in active cigarette smokers, but no association was found for


DOI: 10.23958/ijirms/vol02-i03/08

other forms of tobacco exposure. Smoking cessation decreases morbidity related to PAD; however, risk of progression of PAD is significantly greater in former smokers compared with never-smokers.

Arterial Study found a decreased risk of claudication for patients who stopped smoking compared with those who continued to smoke. Smoking cessation is also associated with a decreased risk of graft failure following lower extremity bypass surgery. effects are limited if the patient reduces cigarette consumption rather than eliminating smoking altogether.[2]

**Obesity:**

Is a leading cause of preventable death, a growing epidemic, and a major contributor to cardiovascular disease risk and mortality. Although obesity's adverse effect on cardiovascular disease risk is well established, it is less clear whether obesity predicts adverse outcomes after coronary artery bypass graft (CABG) surgery.[6],[2]

In addition to its association with traditional cardiovascular factors such as diabetes, hypertension, and dyslipidemia, obesity leads to metabolic changes that precipitate an atherogenic milieu. Adipose tissue is a major producer of proinflammatory cytokines and hormones and is thought to induce low-grade systemic inflammation that has been implicated in the pathogenesis of cardiovascular disease.[6],[2]

**Dyslipidemia:**

Patients with certain lipid and lipoprotein abnormalities [eg, total cholesterol, LDL, triglycerides, lipoprotein (a)] have an increased risk for cardiovascular disease, and adverse long-term cardiovascular outcomes. Patients with PAD are more likely to have increased levels of triglycerides and/or cholesterol, lipoprotein (a), apolipoprotein B, and very low density lipoprotein, compared with patients without PAD.

Conversely, the levels of high density lipoprotein (HDL) cholesterol and apolipoprotein A-I and A-II levels, the "protective" lipoproteins, are lower in these patients. Risk of intermittent claudication was doubled in men with higher concentrations of plasma lipoprotein (a). Patients with premature PAD have lipoprotein (a) levels that are fourfold higher than controls.

Lipoprotein (a) levels vary between ethnic populations, with otherwise healthy African Americans having levels that are almost twice those of Caucasians. a fasting cholesterol level >7 mmol/L (270 mg/dL) was associated with a doubling of the incidence of intermittent claudication; for each 40 mg/dL increase in total serum cholesterol, the odds of developing symptomatic PAD increased by 1.2.[2]

**1.3 Background information global and local:**

**A. Global:**

Despite advances in medical, interventional, and surgical treatment, atherosclerotic disease remains the most important cause of death in developed and underprivileged nations. In the United States alone, coronary artery disease causes approximately 1 of every 6 deaths, accounting for more than 400,000 deaths annually.

Each year, an estimated 785,000 Americans have an initial myocardial infarction, and 470,000 Americans have a recurrent attack. Coronary artery disease remains the leading cause of death in the Western world.

The international incidence of ACS and AMI, especially in developed countries, is similar to that observed in the United States. Despite consumption of rich foods, inhabitants of France and the Mediterranean region appear to have a lower incidence of CAD.

This phenomenon (sometimes called the French paradox) is partly explained by greater use of alcohol, with its possible HDL-raising benefit, and by consumption of the Mediterranean diet, which includes predominant use of monounsaturated fatty acids, such as olive oil or canola oil, as well as omega-3 fatty acids, which are less atherogenic.

Eskimos have been found to have a lower prevalence of CAD as a result of consuming fish oils containing omega-3 fatty acids. The frequency of coronary heart disease in the Far East is significantly lower than that documented in the West. Ill-defined genetic reasons for this phenomenon may exist, but significant interest surrounds the role of diet and other environmental factors in the absence of clinical atherosclerotic vascular disease in these populations.

Atherosclerotic cardiovascular disease is also rare on the African continent, although growing evidence indicates that this too is changing, as a result of rapid westernization and urbanization of the traditionally rural and agrarian African populations. The prevalence of coronary heart disease is also increasing in the Middle East, India, and Central and South America. The rate of CAD in ethnic immigrant populations in the United States. approaches that of the disease in whites, supporting the role of these putative environmental factors.[3]

**B. Local:**

Atherosclerotic disease is the leading cause of death worldwide and in Saudi Arabia. In Saudi Arabia, both CAD and PAD are a major public health problem, with an overall prevalence of 5.5% and 11.7% amongst people aged 45 years and older, respectively.


DOI: 10.23958/ijirms/vol02-i03/08

PAD is a marker of advanced atherosclerosis and is associated with an elevated risk of cardiovascular mortality and morbidity; with a four-fold increased risk of myocardial infarction6 and a two to three-fold increased risk of stroke. Furthermore, the risk of cardiovascular mortality and morbidity in patients with PAD is comparable to that in patients with CAD.

Classical risk factors for CAD; namely, older age, male gender, overweight, hypertension, current smoking, diabetes mellitus, hypertriglyceridemia, and hypercholesterolemia are important risk factors in Saudi population.

Moreover, the metabolic syndrome is taking an active role in the development of CAD in this population. Measures are needed to change lifestyle and to address the management of the metabolic syndrome, as preventive method to reduce modifiable risk factors for CAD. A longitudinal study is needed to demonstrate the importance of reducing modifiable risk factors for CAD in KSA.[5]

**1.4 Rationale:**

Atherosclerosis is one of the main causes of mortality and morbidity. It has a serious complications such as: stroke, elevated blood pressure, aortic aneurysm and heart failure. Because of high incidence of atherosclerosis among patients > 40 years in Najran City, this study will give spot lights on atherosclerosis in patients > 40 years in Najran area.


DOI: 10.23958/ijirms/vol02-i03/08

# Chapter (2)

## 2. Objectives:

### 2.1General objective:

To assess file of atherosclerotic Saudi patients above 40 years in King Khalid Hospital in Najran City from March to April 2014 to identify the risk factors that lead to atherosclerosis.

### 2.2 specific objectives

1. To identify the relationship between age and atherosclerosis.
2. To describe the relationship between smoking and atherosclerosis.
3. To identify the relationship between Gender, dyslipidemia, and obesity and hypertension with atherosclerosis.
4. To assess the effect of diet on atherosclerosis.
5. To identify the relationship between family history and atherosclerosis.


DOI: 10.23958/ijirms/vol02-i03/08

# Chapter (3)

## Literature review:

**Family history and genetic factors:**

Patients with a family history of cardiovascular disease appear to be at increased risk, although the relative contributions of genetics and environmental factors are not fully elucidated but continue to be an active area of investigation.

The risk of PAD is increased in families identified with early onset atherosclerosis, but no single genetic marker has been identified for PAD in this population. Patients with early onset atherosclerosis are a separate subgroup distinct from patients with familial hypercholesterolemia, which is discussed elsewhere.

Atherosclerotic disease likely results from numerous genes interacting with each other and the environment. Studies that have investigated heritable factors in the development of peripheral artery disease (PAD), include family and twin studies, ankle-brachial index variance analysis, and gene studies.

Several studies have found that 20 to 50 percent of the variance in ankle-brachial index (ABI) can be explained by genetic factors. However, in spite of finding such correlations, investigators of the National Heart, Lung, and Blood Institute Twin study found no significant difference in the prevalence of PAD for identical (monozygotic) compared with fraternal (dizygotic) twins (33 percent versus 31 percent) .

In contrast, a study using data from the Swedish Twin Registry and the national patient discharge registry, found that traditional cardiovascular risk factors were significantly more prevalent in twins with PAD compared with those without PAD.

Concordances and correlations were higher in monozygotic compared with dizygotic twins, suggesting genetic influences in PAD. The risk of PAD for persons whose twin had PAD was significantly increased compared with persons whose twin did not have PAD). Genetic effects accounted for 58 percent of the phenotypic variance among the twins, and non-shared environmental effects accounted for about 42 percent.

A metaanalysis of possible genetic susceptibility to PAD found no strong supportive evidence for most genetic polymorphisms, but did identify three genes that may be important variants. In one genotyping study, a discovery meta-analysis found a strong association on chromosome 9 near CDKN2B and ABI. .

The chromosome 9p21 (Chr9p21) locus, identified in 2007, was first associated with coronary artery disease and myocardial infarction, but it may have a more general role in vascular pathology .Additional associations have been demonstrated for carotid artery plaque and plaque progression, peripheral artery disease, and aneurysmal disease.[(2)]

**Ethnicity:**

Ethnic-related differences in prevalence rates of PAD and for risk factors known to be associated with PAD have been identified. The prevalence of PAD is higher in African Americans than non-Hispanic whites. The difference does not appear to be completely explained by differences in the prevalence of risk factors for atherosclerosis. African and Hispanic Americans have higher rates of diabetes and hypertension, whereas Caucasians are more likely to have hypercholesterolemia.

The study show an increased prevalence of PAD for African Americans (men and women), and also Hispanic American women compared with non-Hispanic Caucasian Americans (19.2 and 19.3 percent, respectively, versus 15.6 percent).

Similarly, in the San Diego Population Study, , African Americans had a significantly higher prevalence of PAD (7.8 versus 4.9 percent) compared with non-Hispanic whites . In this study, PAD was defined as an ankle-brachial index (ABI) ≤0.90, an abnormal Doppler waveform, or prior revascularization for PAD.

Although African Americans had significantly higher rates of diabetes, hypertension, and greater body mass index, the increased risk for PAD was maintained after adjustment for these and other variables.

Hispanic and Asian Americans had somewhat lower rates of PAD than non-Hispanic whites, but the difference was not significant. In a multi-ethnic Asian (Chinese, Malays, and Indians) population study from Singapore, PAD was present in 4.3 percent of the population, and a high ABI >1.4 was rare. A systematic review identified 14 studies comparing prevalence between South Asians and white Europeans and found a significantly lower risk of PAD in South Asians with coronary artery disease and diabetes.

The study assessed whether ethnic differences in CAC, common and internal carotid intimal medial thickness (IMT), and the ankle brachial index (ABI) were evident in persons with diabetes and whether these differences persisted following adjustment for measured cardiovascular disease risk factors.


DOI: 10.23958/ijirms/vol02-i03/08

Furthermore, the Multiple Risk Factor Intervention Trial also demonstrated adjusted relative risk of coronary heart disease death for blacks compared with whites to be 0.71 (95% CI, 0.53 to 0.95) . Thus, increased CAC in whites may translate into increased cardiovascular mortality.

Contrary to this observation of increased coronary heart disease incidence and mortality in whites, sudden death due to arrhythmia has been shown to be a more important factor in blacks than in whites. Recent large studies demonstrated excess risk of cardiac arrest and sudden cardiac death in blacks compared with whites.[(2),(10)]

**Hypertension:**

People with high blood pressure (hypertension) are more likely to develop coronary artery disease because high blood pressure puts added force against the artery walls. This extra pressure can damage the arteries building up plaque associated with atherosclerosis. The narrowed artery can limit or block the flow of blood to the heart robbing the heart of oxygen. The hardened surface of the artery can also encourage the formation of small blood clots which can lead to heart attack or stroke. High blood pressure is the most common risk factor for atherosclerosis.

High blood pressure is easily detected and treated. Lowering systolic blood pressure by 10 points leads to a 50 to 60% lower risk by dying of stroke and 40 to 50% lower risk of death from heart attack. Lifestyle changes to help manage high blood pressure include quitting smoking, losing weight, exercising regularly, and a well-balanced diet this is low in fat, cholesterol, and salt, and high in fruits and vegetables.

Most people will also need medications to control hypertension. Hypertension is strongly associated with the development of atherosclerosis in men and women. In the United States, the prevalence of hypertension in adults is about 30 percent. The risk of developing symptoms of PAD, such as intermittent claudicating, in those with hypertension was twice that of those without hypertension in.

The hypertensive patients also have an even higher prevalence of asymptomatic PAD and, further, that patients with PAD were less likely to have antihypertensive treatment compared with those who have other forms of cardiovascular disease.

The association between hypertension and PAD among patients older than 60 years of age was particularly strong in those with untreated and poorly controlled hypertension. Hypertension together with smoking is a major factor for progression of PAD in patients with diabetes mellitus, but there is no evidence that adequate control of hypertension impacts disease progression.[(2),(8)]

**Diabetes:**

Diabetes, by increasing inflammation and slowing blood flow, speeds up atherosclerosis. Individuals with diabetes are two to four times more likely to have heart disease than persons without diabetes. High blood sugar has several effects on cells lining blood vessels as part of atherosclerosis. It increases the production of free radicals, causing premature cell death (apoptosis).

Additionally, it reduces the availability of nitric oxide (NO), which would otherwise enable blood vessels to relax and blood flow to increase. Inflammation in blood vessels is one of the main factors of atherosclerosis, and diabetes makes it much worse.

The risk of stroke is about twice as likely in diabetes patients. Diabetics are at an increased risk of developing atherosclerosis for several reasons including high glucose (blood sugar) levels, higher levels of fats in the blood (dyslipidemia), and high blood pressure. Approximately 65% of diabetic deaths are due to heart disease or stroke.

Studies show that controlling diabetes can prevent or stop the progression of heart and blood vessel disease. Diabetes is a coronary artery disease risk equivalent. Patients with diabetes have more advanced arterial disease at initial diagnosis and poorer outcomes than non-diabetic patients. With more than 20 years follow-up found an increased risk of death for patients with diabetes and PAD, compared with those without diabetes.

Poor glycemic control also incrementally increases the risk of atherosclerosis. A systematic review identified 13 studies evaluating hyperglycemia and cardiovascular risk, and found a 26 percent increase in risk for every 1 percent increase in HbA1c. Diabetes also increased the risk for developing symptomatic PAD.

In one study, the mortality rate for patients with diabetes following aortic or lower extremity revascularization was 9.6 percent compared with 2.2 percent for those without diabetes.

Although the risk of amputation in patients with diabetes is related to the severity of PAD, infection and neuropathy are also contributing factors.[(2),(8)].

**Metabolic syndrome:**

Metabolic syndrome (a constellation of obesity, hypercholesterolemia, hypertension, and insulin resistance) is associated with increased risk for cardiovascular disease. The metabolic syndrome is associated with increased risk for development of both cardiovascular disease and type-2 diabetes in humans.


DOI: 10.23958/ijirms/vol02-i03/08

Central obesity and insulin resistance are thought to represent common underlying factors of the syndrome, which features a chronic low-grade inflammatory state. Diagnosis of the metabolic syndrome occurs using defined threshold values for waist circumference, blood pressure, fasting glucose and dyslipidemia. The metabolic syndrome appears to affect a significant proportion of the population.

Patients with metabolic syndrome had a higher incidence of vascular events (vascular death, stroke, myocardial infarction) compared with patients with PAD and no metabolic syndrome (15 percent versus 8 percent).

The study show that 27,111 women without baseline cardiovascular disease over an average of 13.3 years found that women with metabolic syndrome had a 62 percent increased risk for future symptomatic PAD, compared with those without metabolic syndrome.

The primary management of metabolic syndrome involves healthy lifestyle promotion through moderate calorie restriction, moderate increase in physical activity and change in dietary composition. Treatment of individual components aims to control dyslipidemia using fibrates and statins, elevated blood pressure, and hyperglycemia. While no single treatment for the metabolic syndrome yet.[(2),(11)]

**Homocysteinemia:**

Homocysteinemia, a separate but related entity, is defined as elevation of the homocysteine level in blood. This condition has also been referred to as homocyst(e)inemia to reflect metabolites that may accumulate. A mild elevation of plasma homocysteine may exist without homocystinuria.

Homocysteinemia may be due to a genetic predisposition to abnormal activity in the same pathways as homocystinuria. Nutritional and environmental factors, as well as specific medications, may worsen this abnormality and provoke symptoms.

An increased homocysteine level is associated with a higher risk of strokes. Carotid stenosis appears to have a graded response to increased levels of homocysteine. Increased carotid plaque thickness has been associated with high homocysteine and low B-12 levels.

Many studies are related to high prevalence of hyperhomocysteinemia in some populations, suggesting the necessity to evaluate the consequence of this risk factor on diseases in this area.

Some studies showed a strong association between hyperhomocysteinemia and stroke in these populations but studies on the relationship between hyperhomocysteinemia and coronary heart diseases are rare.

High levels of homocysteine are associated with earlier onset atherosclerosis and have been found in up to 41 percent of patients with PAD. Homocysteine is thought to promote smooth muscle proliferation, increase arterial wall inflammation, and increase levels of plasminogen activator inhibitor. Homocysteine also interferes with nitric oxide released by endothelial cells. Excess homocysteine leads to vessel thickening, luminal stenosis and thrombus formation.

A more rapid progression of PAD in patients with increased homocysteine has been described in some studies , but not others . However, although increased homocysteine levels are associated with an increased risk for developing PAD and more rapid progression of PAD, no study has shown that homocysteine lowering therapy reduces PAD progression or improves outcomes. [(2),(14),(15)]

**C - reactive- protein:**

CRP, also known as C - reactive protein, is a test which measures the concentration in blood serum of a special type of protein produced in the liver which is present during episodes of acute inflammation or infection. In the body, CRP plays the important role of interacting with the complement system, an immunologic defense mechanism.

Studies have indicated that CRP may be elevated in heart attacks. It is yet to be determined if CRP serves as a marker of heart disease or whether it plays a part in causing atherosclerotic disease (hardening of the arteries).There is also a high sensitivity CRP test (hs-CRP) in addition to the regular CRP test. The hs-CRP measures very low amounts of CRP in the blood and is typically used to assess risk for heart problems.

An elevated blood level of CRP (C-reactive protein) has been shown to predict a high risk of future cardiovascular events, such as heart attack and stroke. CRP is a protein released into the bloodstream any time there is active inflammation in the body. (Inflammation occurs in response to infection, injury or various chronic inflammatory conditions such as arthritis.

It is now thought that atherosclerosis itself is at least partly an inflammatory process. The association of elevated CRP levels with an increased risk of cardiovascular events supports this relationship between inflammation and atheroscleosis (coronary artery disease).

However, scientists do not know whether CRP is merely a marker for increased risk or is instead a factor that actually produces increased risk. Now, evidence from a new study in mice suggests that CRP may be a causative agent for the progression of atherosclerosis.

In a study, scientists from the Baylor College of Medicine examined the effect of CRP on the progression of


DOI: 10.23958/ijirms/vol02-i03/08

atherosclerosis in mice. One group of mice was genetically manipulated to produce human CRP, and another group was not. In the mice with CRP, arterial plaques due to atherosclerosis were 48% larger than in mice without CRP.

**Alcohol:**

The effect of alcohol on health and heart disease is complex. For some people, even mild alcohol use carries major risks. For others, moderate alcohol use may offer a degree of protection. Moderate alcohol consumption seems to offer protection against heart disease for some people.

Moderate drinking is defined as no more than one drink per day for women or lighter-weight persons and no more than two drinks per day for men. One drink is equal to the following: 12 ounces of beer or wine cooler, 5 ounces of wine, or 1.5 ounces of 80-proof liquor.

Specific suspected heart-related benefits of alcohol include: Raises HDL, or "good" cholesterol level, Lowers blood pressure, Inhibits the formation of blood clots (this can be good or bad). It may prevent heart attacks but could increase the risk of bleeding).Helps prevent artery damage caused by high LDL, or "bad" cholesterol. But, until we know more about the pros and cons of alcohol consumption, doctors do not recommend drinking alcohol specifically for better heart health.

The presence of human CRP made atherosclerosis progress significantly faster. This study provides the first real evidence that CRP itself accelerates atherosclerosis - and the heart attacks and strokes caused by atherosclerosis. [(12),(13)]

Drinking alcohol can be harmful for some people. Those who have heart failure, cardiomyopathy (abnormal heart muscle function), high blood pressure, diabetes, arrhythmia (irregular heart rhythm), a history of stroke, obesity, high triglycerides, or are taking medications

Drinking too much alcohol can raise the levels of some fats in the blood (triglycerides). It can also lead to high blood pressure, heart failure and an increased calorie intake. (Consuming too many calories can lead to obesity and a higher risk of developing diabetes.)

Excessive drinking and binge drinking can lead to stroke. Other serious problems include fetal alcohol syndrome, cardiomyopathy, cardiac arrhythmia and sudden cardiac death.

The linkage reported in many of these studies may be due to other lifestyle factors rather than alcohol. Such factors may include increased physical activity, and a diet high in fruits and vegetables and lower in saturated fats No direct comparison trials have been done to determine the specific effect of wine or other alcohol on the risk of developing heart disease or stroke.(16),(17)

**Stress:**

Stress is a normal part of life. But if left unmanaged, stress can lead to emotional, psychological, and even physical problems, including heart disease, high blood pressure, chest pains, or irregular heartbeats.

Stress itself might be a risk factor, or it could be that high levels of stress make other risk factors (such as high cholesterol or high blood pressure) worse.

For example, if you are under stress, your blood pressure goes up, you may overeat, you may exercise less, and you may be more likely to smoke.

If stress itself is a risk factor for heart disease, it could be because chronic stress exposes your body to unhealthy, persistently elevated levels of stress hormones like adrenaline and cortisol. Studies also link stress to changes in the way blood clots, which increases the risk of heart attack.[(18)]

**Sleep apnea:**

Plain old snoring can get a little annoying, especially for someone listening to it. But when a snorer repeatedly stops breathing for brief moments, it can lead to cardiovascular problems and potentially be life-threatening.

It's a condition known as sleep apnea, in which the person may experience pauses in breathing five to 30 times per hour or more during sleep. These episodes wake the sleeper as he or she gasps for air. It prevents restful sleep and is associated with high blood pressure, arrhythmia, stroke and heart failure.

Heart disease is the leading cause of death in America, and stroke is the No. 4 cause and a leading cause of disability. High blood pressure is a major risk factor for both.

"The evidence is very strong for the relationship between sleep apnea and hypertension and cardiovascular disease generally, so people really need to know that. Obstructive sleep apnea is associated with obesity, which is also a major risk factor for heart disease and stroke.

Besides obesity contributing to sleep apnea, sleep deprivation caused by sleep apnea can, in an ongoing unhealthy cycle, lead to further obesity.[(19)]


DOI: 10.23958/ijirms/vol02-i03/08

# Chapter (4)

## Methods and materials:

### 1. Study Design:

This study is a facility- based descriptive case series study will be in King Khalid Hospital to identify the risk factor that lead to atherosclerosis among patients > 40 years in Najran City. It uses the non-probability sampling.

### 2. Study Population:

They will be Saudi Patients above 40 years with atherosclerosis in King Khalid Hospital in Najran City, to identify the risk factors of atherosclerosis.

### 3. Study variables:

**Dependent variable:**

Risk factors of atherosclerotic Saudi Patients above 40 years old in King Khalid Hospital in Najran City

**Independent variable:**

1. Age
2. Smoking
3. Dyslipidemia
4. Obesity
5. Gender

### 4. Study Area:

The study will be in King Khalid Hospital in on King Abdul-Aziz street in Najran City. Najran is a city in southwestern Saudi Arabia near the border with Yemen. It is the capital of Najran Province. Designated a New town, Najran is one of fastest-growing cities in the Kingdom ;its population has risen from 47,500 in 1974 and 90,983 in 1992 to 246,880 in 2004.The population belong mostly to the ancient tribe of Yam.

The Arabic term of Najran has at least two meanings. It means both the wooden frame on which a door opens and also "thirsty". Local tradition has it that the land derived its name from the first man to settle in the area, Najran ibn Zaydan ibn Saba ibn Yahjub ibn Yarub ibn Qahtan.

Najran was Yemeni centre of cloth making and originally, the Kiswah or the cloth of Ka'aba was made there (the clothing of Ka'aba first start by Yemeni king of Saba). There used to be Jewish community at Najran, renowned for the garmnets they manufactured.

According to Yemenite Jewish tradition, the Jews of Najran traced their origin to the ten Tribes. Najran was also an important stopping place on the incense route. This study is facility –based study.

Beside the building, There is King Fahd Mosque. There are 8 clinics which are (Ophthalmic, Dermatology, ENT, Psychology, Internal medicine, Surgery, OPD, Emergency department). The people in this area are very cooperative, kindness and friendly with other.

### 5. Sampling:

The study area will be in King Khalid Hospital on King Abdul-Aziz street which is a residential area in Najran City. The study population will be atherosclerotic Saudi Patients above 40 years old (including: employees and their families) with atherosclerosis in King Khalid Hospital. It is a qualitative study based on the non-probability sampling by selective sampling techniques will be using for the selection of 50 atherosclerotic Saudi patients above 40 years.

### 6-Methods of data collection:

The methods of data collection will involve structural interview (check-list).

### 7-Data processing and analysis:

Data processing and analysis will be done by entering the data into SPSS software for Windows 7.


DOI: 10.23958/ijirms/vol02-i03/08

# Chapter (5)

## Result:

**From table (1):**
We found that most gender effected by atherosclerosis are male about 62%.

**From table (2):**
We found that most of patients have no family history of atherosclerosis about 94%.

**From table (3):**
We found that most of patients of atherosclerosis are not obese about 72%.

**From table (4):**
We found that most of patients of atherosclerosis are hypertensive about 84%.

**From figure (1):**
We found that most age group effected by atherosclerosis are from 60-69.

**From figure (2):**
We found that most patients effected by atherosclerosis have no dyslipidemia about 64%.

**From figure (3):**
We found that most patients effected by atherosclerosis are diabetes about 65.31%

**From figure (4):**
We found the duration of diabetes in most atherosclerotic Saudi patients from (6-10 years), (16-10 years) about 29.1%.

**From figure (5):**
We found the most patients with atherosclerosis have no stroke 74%.

**From figure (6):**
We found the most patients with atherosclerosis are not smoker about 90%.

**From figure (7):**
We found the most atherosclerotic Saudi patients with diabetes are male about 51.02%.

**From figure (8):**
We found the most atherosclerotic Saudi patients with hypertension are male about 48%.

**From figure (9):**
We found the most atherosclerotic Saudi patients with obesity are female about 22%.

**From figure (10):**
We found the most atherosclerotic Saudi patients with dyslipidemia are female about 26%.

**From figure (11):**
We found the most atherosclerotic Saudi patients with stroke are from age 60-69 years old.

**From figure (12):**
We found the most atherosclerotic Saudi patients are somker from age 60-79 years old.

**Table (1): relationship between gender and atherosclerosis in Saudi patients above 40 years old**

| Gender | Frequency | Percent |
|---|---|---|
| Valid Male | 31 | 62.0 |
| female | 19 | 38.0 |
| **Total** | **50** | **100.0** |

**Table (2): relationship between family history and atherosclerosis in Saudi patients above 40 years old**

| Family | Frequency | Percent |
|---|---|---|
| Valid Yes | 3 | 6.0 |
| No | 47 | 94.0 |
| **Total** | **50** | **100.0** |

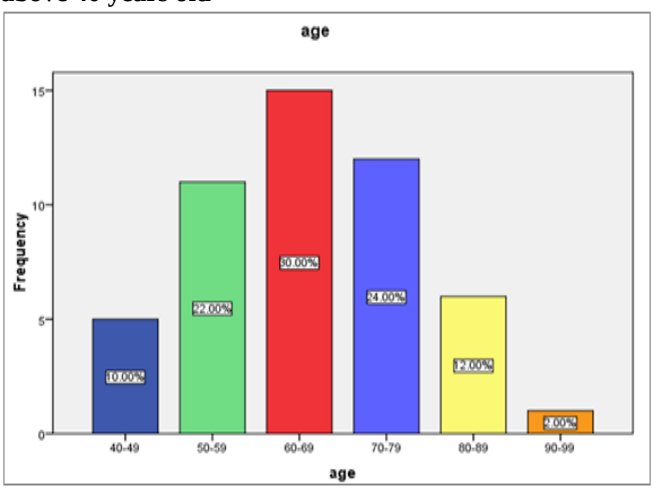
**Table (3): relationship between obesity and atherosclerosis in Saudi patients above 40 years old**

| Obesity | Frequency | Percent |
|---|---|---|
| Valid Yes | 14 | 28.0 |
| No | 36 | 72.0 |
| **Total** | **50** | **100.0** |

**Table (4): relationship between hypertension and atherosclerosis in Saudi patients above 40 years old**

| Hypertenstion | Frequency | Percent |
|---|---|---|
| Valid Yes | 42 | 84.0 |
| No | 8 | 16.0 |
| **Total** | **50** | **100.0** |

**Figure (1): effect of age on atherosclerotic Saudi patients above 40 years old**





DOI: 10.23958/ijirms/vol02-i03/08

**Figure (2): effect of dyslipidemia on atherosclerotic Saudi patients above 40 years old**

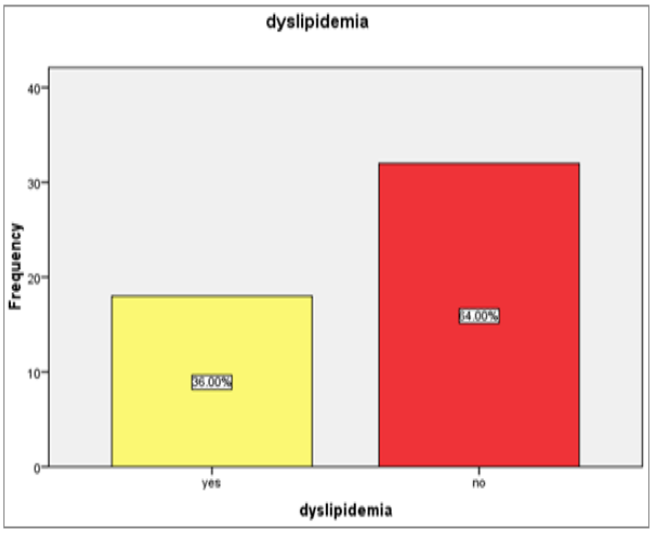



**Figure (3): effect of diabetes on atherosclerotic Saudi patients above 40 years old**

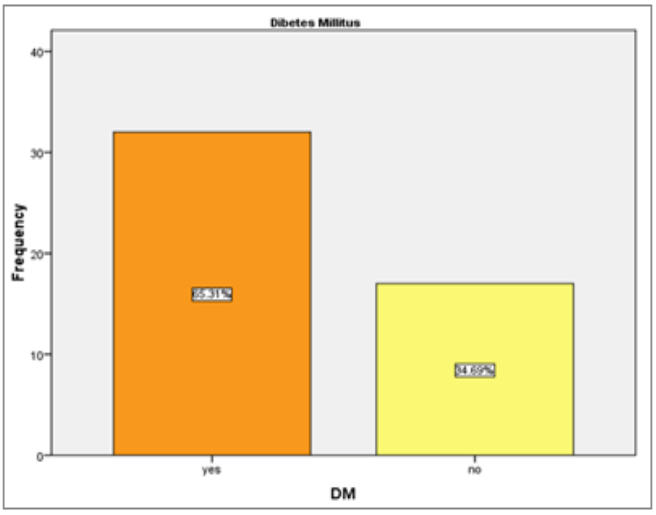



**Figure (4): duration of diabetes on atherosclerotic Saudi patients above 40 years old**

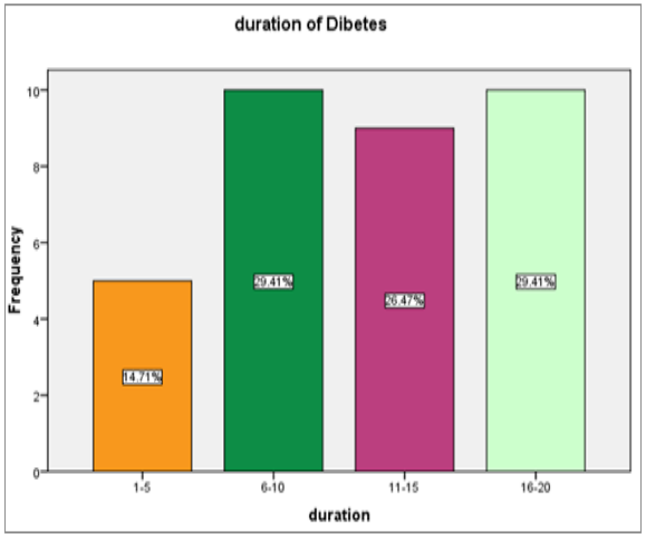



**Figure (5): Relationship between stroke and atherosclerosis in Saudi patients above 40 years old**

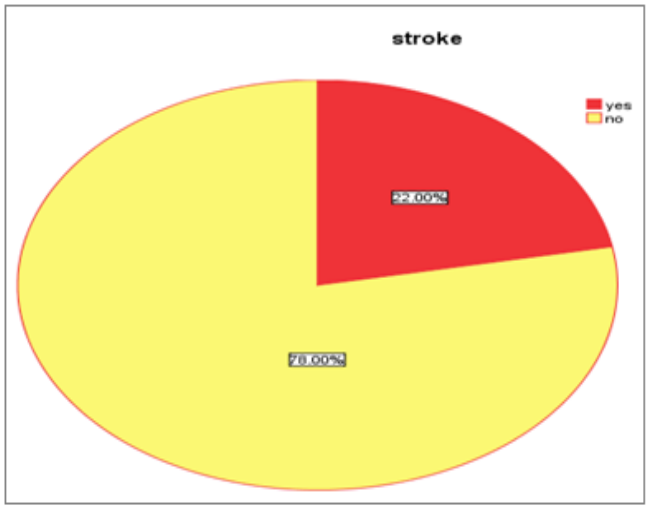



**Figure (6): effect of smoking on atherosclerotic Saudi patients above 40 years old**

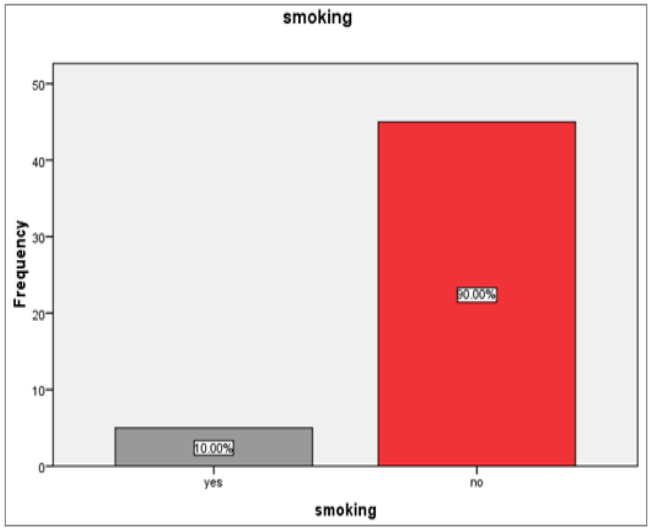
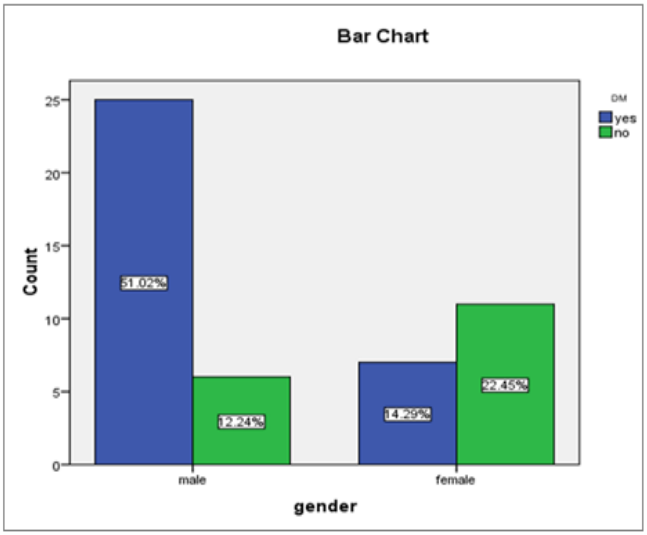



**Figure (7): Relationship between gender and diabetes in atherosclerotic Saudi patients above 40 years old**





DOI: 10.23958/ijirms/vol02-i03/08

**Figure (8): Relationship between gender and hypertension in atherosclerotic Saudi patients above 40 years old**

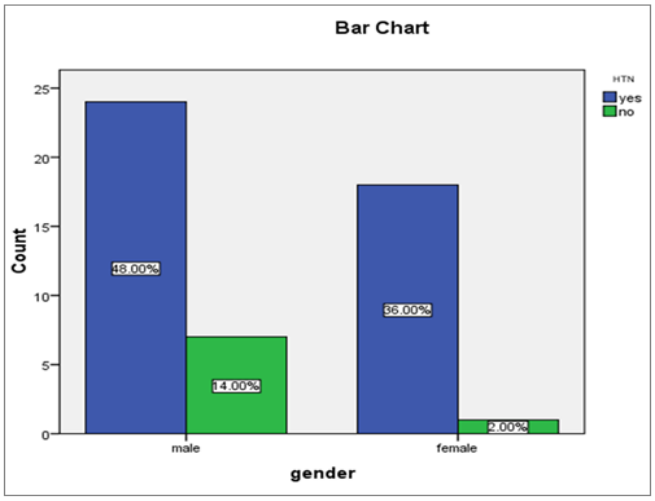



**Figure (9): Relationship between gender and obesity in atherosclerotic Saudi patients above 40 years old**

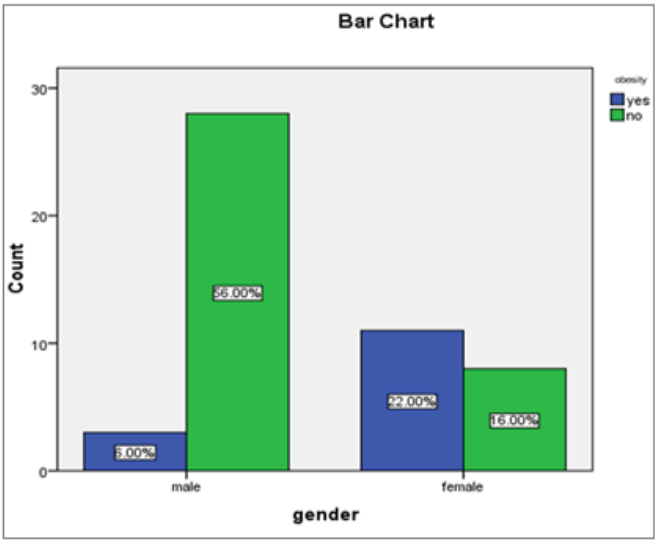



**Figure (10): Relationship between gender and dyslipidemia in atherosclerotic Saudi patients above 40 years old**

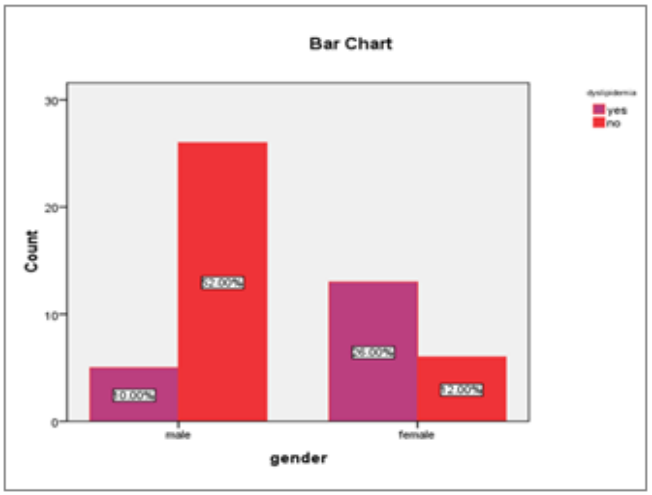



**Figure (11): Relationship between age and stroke in atherosclerotic Saudi patients above 40 years old**

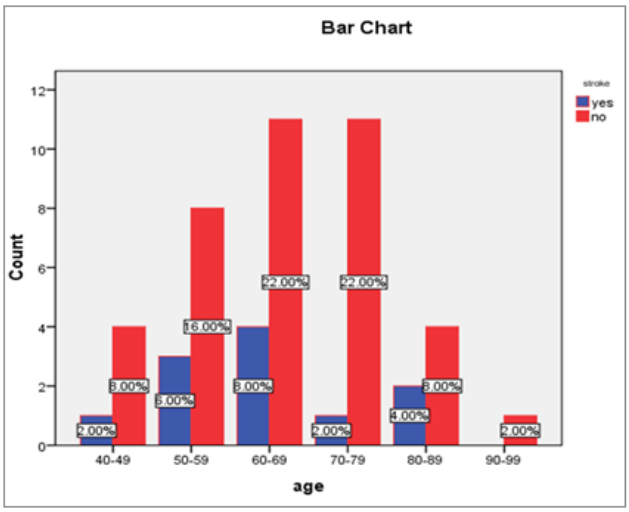
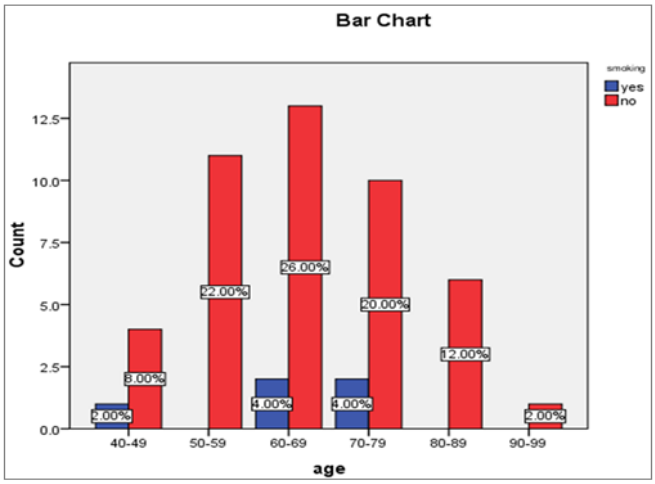



**Figure (12): Relationship between age and smoking in atherosclerotic Saudi patients above 40 years old**




## Discussion:

This study shown the diabetes effect on atherosclerotic Saudi patients about 65.1% while other are 35.9% aren't affected, and this cause is prominent in Saudi Arabia generally as my study done in a part of Saudi Arabia and this is due to most Saudis with diabetes are not regular for taking treatment and have the ignorance and lack of education about the dangers of diabetes and it leads to a growing and dangerous diseases such as heart disease. Although many studies have documented an increased prevalence of atherosclerosis in recent years, this is similar to all prevalence that registered on other studies as In the United States, Each year, an estimated 785,000 Americans have an initial myocardial infarction, and 470,000 Americans have a recurrent attack. Coronary artery disease remains the leading cause of death in the Western world.

The hypertension are second one as risk in most Saudi people about 84% are effected , , and most of them are diabetics which mean that diabetes and hypertension related


DOI: 10.23958/ijirms/vol02-i03/08

together this result was predicted as any area in the world and the 16.% who hasn't hypertension are well controlled by using the proper medication. but the percent of those who has stroke which is correlated together with diabetes and hypertension are less than that registered in the world wide this due to all file that I researched are low and I can't generalized.

As the smoking affects 10% and not affects 90% on atherosclerotic Saudi patients and most smoker at age 60-79 years old in King Khalid Hospital this percent is different as registered on other study this due to low number of files.

The obesity in atherosclerotic Saudi patients was about 28.% and obesity was common in female patients and this percent is not more like other study due to culture in najran people tribe-dependent and they don't care for physical activity but was right that is more in female this due to obesity leads to metabolic changes that precipitate an atherogenic milieu . Adipose tissue is a major producer of proinflammatory cytokines and hormones and is thought to induce low-grade systemic inflammation that has been implicated in the pathogenesis of cardiovascular disease as other studies in world wide is obviously.

dyslipidemia was affected in 36% of population and more in female about 26% and this due to obesity in some people and diabetics in other ,this result indicate reasonable percent like other study this due to diabetecs has role in pathogenesis of atherosclerosis and obese people has abnormality in lipid and insulin resistance which play role in disturbance of lipid.

Family history has low percent in this study about 6% and this percent different from study to other some study had an increasing in family history and other not this means that no specific percent for family history because family history different from nations to nations even from tribe to tribe also, from area to area according the culture and life style of people.

## Conclusion:

The diabetes found that the most common factor of atherosclerosis in Najran people in King Khalid hospital.

Hypertension patients consider second risk factor in najran people and mostly associated with diabetics.

Smoking has role in atherosclerosis and was found some of people were smoker about 10%.

We found that Most of atherosclerotic Saudi patients were obese and female in King Khalid hospital.

We found that Most of atherosclerosis suffering from dyslipidemia and their cases development to stroke in King Khalid hospital.

## Recommendation:

I advice patients with diabetics in King Khalid Hospital with some Dietary advice such as maintain or improve health through the use of appropriate and healthy food choices,To achieve and maintain optimal metabolic and physiological outcomes, including: Reduction of risk for microvascular disease by achieving near normal glycaemia without undue risk of hypoglycaemia,Reduction of risk of macrovascular disease, including management of bodyweight, dyslipidaemia and hypertension,To optimise outcomes in diabetic nephropathy and in any other associated disorder. Also, I adivce them to do some exercises because of Regular physical activity improves insulin resistance and lipid profile (reduction in triglyceride and increase in high-density lipoprotein (HDL)) and lowers blood pressure (although blood pressure will rise during exercise).The metabolic benefits in type 2 diabetes are lost within 3-10 days of stopping regular exercise. Physical activity also protects against the development of type 2 diabetes. Finally, to control instructions of doctor about medications which is consider the most important to avoid or delay complications.

I advice patients with hypertension in King Khalid Hospital with some recommendations If are overweight – lose weight – 1–2 lbs a week: avoid fad or rigid diets. Weight loss is the single most effective non-drug method for lowering blood pressure and helping to correct other risk factors for heart disease like diabetes and abnormal amounts of cholesterol in the blood. Reduce Salt Intake: Avoid processed foods, canned soups, tomato juice, and obviously salty foods such as pretzels, pickles, etc. – avoid foods with more than 150 mg of sodium in each portion. Walking for 30–45 minutes 3–4 times a week, climbing extra stairs, participating in sports that you enjoy will help to reduce your heart attack risk and may lower blood pressure. Taking the drug regularly on time and dose.

I advice smokers with atherosclerosis in King Khalid Hospital to stop smoking that is risk for hypertension and other factors that lead to atherosclerosis and do exercise regularly

I advice obese with atherosclerosis to do exercise and follow specific diet to decrease their weight.

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DOI: 10.23958/ijirms/vol02-i03/08

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DOI: 10.23958/ijirms/vol02-i03/08

**Annexes:**



DOI: 10.23958/ijirms/vol02-i03/08

بسم الله الرحمن الرحيم

Kingdom of Saudi Arabia

Najran University

College of Medicine

Batch 3

**Risk Factors of Atherosclerosis among Saudi Patients Over 40 Years Old in Najran at King Khalid Hospital**

By:

**Fahad AL-Dossary Level/ 8**

**Supervisor: Dr. Osama Osman Badawy**

This chick list is for complete the research course in the university and is not for the purpose of publishing

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**Name of patient:**……..

**Diagnosis:**…….

1. Age:……

2. Gender: O Male O Female

3. – FH: (Any family member has atherosclerotic disease)

O Yes O No

- Relation with them

.. ……

.....

.....

4. Dyslipidemia

.....

.....

5. - Diabetes Mellitus (type 1 or type 2 diabetes)

.....

.....

- Duration Diabetes

.....

.....

- Treatment regularly

O Controlled O Uncontrolled

6. Hypertensive

O Yes O No


DOI: 10.23958/ijirms/vol02-i03/08

- If yes take medications or not

Controlled or not

.....

.....

7. Stroke

O Yes O No

- Types of medication

.....

.....

8. Obesity

BMI waist circumference

.....

.....

9. History of smoking

.....

.....


DOI: 10.23958/ijirms/vol02-i03/08