

Risk Factors of Diabetes Mellitus among Saudi Patients above 40 Years in Dahda Area



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Abstract:

Diabetes mellitus (DM) is a syndrome of chronic hyperglycaemia due to relative insulin deficiency, resistance, or both. It affects more than 120 million people world-wide, and it is estimated that it will affect 370 million by the year 2030. Diabetes is usually irreversible and, although patients can have a reasonably normal lifestyle, its late complications result in reduced life expectancy and major health costs. These include macrovascular disease, leading to an increased prevalence of coronary artery disease, peripheral vascular disease and stroke, and microvascular damage causing diabetic retinopathy and nephropathy. Neuropathy is another major complication.^[1]

A facility and community - based descriptive case study will be conducted in Dahda area and the Primary Health Care Center that related to this area to determine the risk factors of diabetes mellitus among people above 40 years old . Purposive and selective non-probability sampling techniques will be using for the selection of 55 diabetic patients. These include male and female Saudi. The data will be collected by questionnaires, the check lists, and interview interviews.

The combined data revealed that the family history has a relationship with diabetes mellitus as it affect 72.72% of diabetic patients and just 27.28% are not affected, the obesity is absent in 63.64 %, but it is present in 36.36%, the physical inactivity lead to the diabetes mellitus in 81.81% while 18.19 is not affected, The pregnancy affects 12.72% and not affects 87.28% of the diabetic women and effect of hypertension on diabetes mellitus in Dahda is 16.36% while 83.64% not affected.

In this study we recommended that people must practice the sports at least one hour each day to control the diabetes mellitus or to prevent occurrence of diseases. In addition, they must eat the healthy diet and avoid the fatty food while they should reduce their weights if they are obese. Also, they are in a need to consult a physician to control their diabetes.

Keyword: DM/diabetes mellitus

Chapter (1)

1. Introduction:

1.1 Definition:

Diabetes mellitus (DM) is a syndrome of chronic hyperglycaemia due to relative insulin deficiency, resistance, or both. It affects more than 120 million people world-wide, and it is estimated that it will affect 370 million by the year 2030. Diabetes is usually irreversible and, although patients can have a reasonably normal lifestyle, its late complications result in reduced life expectancy and major health costs. These include macrovascular disease, leading to an increased prevalence of coronary artery disease, peripheral vascular disease and stroke, and microvascular damage causing diabetic retinopathy and nephropathy. Neuropathy is another major complication.^[1]

1.2 Statement and Analysis:

Although a family history of type 2 diabetes is a strong risk factor for the disease, the factors mediating this excess risk are poorly understood. In the InterAct case-cohort study, we investigated the association between a family history of diabetes among different family members and the incidence of type 2 diabetes, as well as the extent to which genetic, anthropometric and lifestyle risk factors mediated this association.^[2]

Obesity is probably the most important factor in the development of insulin resistance, but science's understanding of the chain of events is still spotty. Now, researchers have filled in the gap and identified the missing link between the two. Their findings explain how obesity sets the stage for diabetes and why thin people can become

insulin resistant. Abdominal fat is a major risk factor not only for insulin resistance and type 2 diabetes but also for heart and blood vessel disease, also called cardiovascular disease (CVD).

Gestational diabetes develops during pregnancy (gestation). Like other types of diabetes, gestational diabetes affects how your cells use sugar (glucose). Gestational diabetes causes high blood sugar that can affect your pregnancy and your baby's health. In gestational diabetes, blood sugar usually returns to normal soon after delivery.^[5]

High blood pressure (hypertension) can lead to and make worse many complications of diabetes, including diabetic eye disease and kidney disease. Most people with diabetes develop high blood pressure during their life. Having diabetes makes high blood pressure and other heart and circulation problems more likely because diabetes damages arteries and makes them targets for hardening (atherosclerosis).^[6]

1.3 Background:

1.3.1 Local Diabetes Mellitus:

A total of 17232 Saudi subjects were selected in the study, and 16917 participated (98.2% response rate). Four thousand and four subjects (23.7%), out of 16917 were diagnosed to have DM. Thus, the overall prevalence of DM obtained from this study is 23.7% in KSA. The prevalence in males and females were 26.2% and 21.5% ($p < 0.00001$). The calculated age-adjusted prevalence for Saudi population for the year 2000 is 21.9%. Diabetes mellitus was more prevalent among Saudis living in urban areas of 25.5% compared to rural Saudis of 19.5% ($p < 0.00001$). Despite the readily available access to healthcare facilities in KSA, a

large number of diabetics 1116 (27.9%) were unaware of having DM. Conclusion: The overall prevalence of DM in adults in KSA is 23.7%. A national prevention program at community level targeting high risk groups should be implemented sooner to prevent DM. We further recommend a longitudinal study to demonstrate the importance of modifying risk factors for the development of DM and reducing its prevalence in KSA.^[7]

1.3.2 Global Diabetes Mellitus:

The prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030. The prevalence of diabetes is higher in men than women, but there are more women with diabetes than men. The urban population in developing countries is projected to double between 2000 and 2030. The most important demographic change to diabetes prevalence across the world appears to be the increase in the proportion of people >65 years of age. These findings indicate that the "diabetes epidemic" will continue even if levels of obesity remain constant. Given the increasing prevalence of obesity, it is likely that these figures provide an underestimate of future diabetes prevalence.^[8]

1.4 Rationale:

Diabetes mellitus is a common disease in Najran city and it has serious complications such as elevated blood pressure, retinopathy and neuropathy. In addition, because of high incidence of diabetes mellitus among old age in Najran city. Most of people are apprehensive to be diabetic. So, I would like to know what the risk factors can lead to the disease and how can we protect ourselves.

Chapter (2)

2. Objectives

2.1 General Objective:

To visit diabetic Saudi patients above 40 years at home in Dahda area and to review the files of diabetic Saudi patients in Dahda Primary Health Care from the period April to May 2014 to identify the risk factors of Diabetes Mellitus.

2.2 Specific Objectives:

To describe the relation between family history and Diabetes Mellitus.

To recognize the role of obesity in Diabetes Mellitus.

To identify affect of exercise in Diabetes Mellitus.

To describe the relation between pregnancy and diabetes mellitus.

To describe affect of hypertension in diabetes mellitus.

Chapter (3)

3. Literature Review:

3.1 Diabetes Mellitus and Family History

A family history of diabetes increases the risk for prediabetes; however, the effect seems significant mainly in people who are not obese, according to a meta-analysis. "This might indicate that the effect of a family history of diabetes on prediabetes becomes readily measurable only when not overshadowed by strong risk factors such as obesity,"

A positive family history of type 2 diabetes is well-known to be a risk factor for the disease, nearly doubling the risk for diabetes among offspring; however, research on the risk for prediabetes or for any subcategories such as impaired fasting glucose (IFG) or impaired glucose tolerance (IGT), has been lacking.

3.1.1 Genetic of Diabetes

3.1.1.1 genetic of Diabetes (type 1)

In most cases of type 1 diabetes, people need to inherit risk factors from both parents. We think these factors must be more common in whites because whites have the highest rate of type 1 diabetes. Because most people who are at risk do not get diabetes, researchers want to find out what the environmental triggers are. One trigger might be related to cold weather. Type 1 diabetes develops more often in winter than summer and is more common in places with cold climates. Another trigger might be viruses. Perhaps a virus that has only mild effects on most people triggers type 1 diabetes in others. Early diet may also play a role.^[10]

3.1.1.2 Genetic of Diabetes (type 2)

Type 2 diabetes has a stronger link to family history and lineage than type 1, although it too depends on environmental factors. Studies of twins have shown that genetics play a very strong role in the development of type 2 diabetes. Lifestyle also influences the development of type 2 diabetes. Obesity tends to run in families, and families tend to have similar eating and exercise habits. If you have a family history of type 2 diabetes, it may be difficult to figure out whether your diabetes is due to lifestyle factors or genetic susceptibility. Most likely it is due to both. However, don't lose heart. Studies show that it is possible to delay or prevent type 2 diabetes by exercising and losing weight.^[10]

3.2 Diabetes Mellitus and Obesity

3.2.1 Fat distribution

The distribution of excess adipose tissue is another important determinant of the risk of insulin resistance and type 2 diabetes. The degree of insulin resistance and the

incidence of type 2 diabetes are highest in those subjects with central or abdominal obesity, as measured by waist circumference or waist-to-hip circumference. Intra-abdominal (visceral) fat rather than subcutaneous or retroperitoneal fat appears to be of primary importance in this regard. This 'male' type obesity is different from the typical 'female' type, which primarily affects the gluteal and femoral regions and is not as likely to be associated with glucose intolerance or cardiovascular disease. Why the pattern of fat distribution is important and the relative roles of genetic and environmental factors in its development are not known.^[11]

3.2.2 High birth weight

Higher birth weight (>4.0 kg) may also be associated with an increased risk of diabetes. A meta-analysis of 14 studies (involving 132,180 individuals) of birth weight and subsequent risk of type 2 diabetes demonstrated a U-shaped relationship between birth weight and diabetes risk. High birth weight was associated with increased risk of diabetes in later life to the same extent as low birth weight (odds ratios 1.36 versus 1.47).^[12]

3.3 Diabetes Mellitus and pregnancy

3.3.1 Definition

Gestational diabetes is a type of diabetes that develops or is first recognized during pregnancy (13)

3.3.2 Women at Risk

- They are at risk for gestational diabetes if they
- Had a previous pregnancy with gestational diabetes.
- Had a baby born weighing over 9 pounds.
- Are overweight or obese.
- Are more than 25 years old.
- Have a family history of diabetes.
- Are African American, Hispanic, American Indian, Alaska Native, Native Hawaiian, or Pacific Islander.
- Are being treated for HIV^[13]

3.3.3 Implications for the mother

Gestational diabetes is managed where possible by dietary modification, particularly by reducing consumption of refined carbohydrates (see Box 21.26). Blood glucose is monitored closely and insulin is introduced if glycaemic control is unsatisfactory. In certain cases metformin or glibenclamide (the only sulphonylurea that does not cross the placenta) is used.^[14]

3.3.4 Causes of gestational diabetes

Almost all women have some degree of impaired glucose intolerance as a result of hormonal changes that occur

during pregnancy. That means that their blood sugar may be higher than normal, but not high enough to have diabetes. During the later part of pregnancy (the third trimester), these hormonal changes place pregnant woman at risk for gestational diabetes. During pregnancy, increased levels of certain hormones made in the placenta (the organ that connects the baby by the umbilical cord to the uterus) help shift nutrients from the mother to the developing fetus. Other hormones are produced by the placenta to help prevent the mother from developing low blood sugar.^[15]

3.3.5 Complication

3.3.5.1 Complications that may affect the baby

3.3.5.1.1 Excessive birth weight

Extra glucose in your bloodstream crosses the placenta, which triggers your baby's pancreas to make extra insulin. This can cause your baby to grow too large (macrosomia). Very large babies - those that weigh 9 pounds or more - are more likely to become wedged in the birth canal, sustain birth injuries or require a C-section birth.^[16]

3.3.5.1.2 Hypoglycemia

Newborn baby has low blood glucose, which can cause poor feeding, blue-tinged skin and irritability. Sometimes babies of mothers with gestational diabetes develop low blood sugar (hypoglycemia) shortly after birth because their own insulin production is high. Severe episodes of hypoglycemia may provoke seizures in the baby. Prompt feedings and sometimes an intravenous glucose solution can return the baby's blood sugar level to normal.^[16,17]

3.3.5.1.3 Respiratory Distress Syndrome

3.3.5.1.3.1 Definition

Respiratory distress syndrome (RDS) is a breathing disorder that affects newborns. RDS rarely occurs in full-term infants. The disorder is more common in premature infants born about 6 weeks or more before their due dates.^[18]

3.3.5.1.3.2 Pathophysiology

The lungs of infants with respiratory distress syndrome are developmentally deficient in a material called surfactant, which helps prevent collapse of the terminal air-spaces (the future site of alveolar development) throughout the normal cycle of inhalation and exhalation. Surfactant is a complex system of lipids, proteins and glycoprotein which are produced in specialized lung cells called Type II cells or Type II pneumocytes. Surfactant, the air-spaces collapse and are very difficult to expand. Microscopically, a surfactant deficient lung is characterized by collapsed air-spaces alternating with hyper-expanded areas, vascular congestion and, in time, hyaline membranes. Hyaline membranes are composed of fibrin, cellular debris, red blood cells, rare neutrophils and macrophages. They appear as an

eosinophilic, amorphous material, lining or filling the air spaces and blocking gas exchange.^[19]

3.3.5.2 Complications that may affect the mothers

- **High blood pressure and preeclampsia.** Gestational diabetes raises your risk of high blood pressure, as well as, preeclampsia - a serious complication of pregnancy that causes high blood pressure and other symptoms that can threaten the lives of both mother and baby.^[16]
- **Future diabetes.** If you have gestational diabetes, you're more likely to get it again during a future pregnancy. You're also more likely to develop type 2 diabetes as you get older.^[16]

3.4 Diabetes Mellitus and Hypertension

3.4.1 Introduction

High blood pressure (hypertension) is arguably the most important preventable cause of premature microvascular and macrovascular disease and the associated morbidity and mortality in people with diabetes.^[20,21]

3.4.2 Preventing Hypertension with Diabetes

There are many minor lifestyle changes that can lower your blood pressure. Most are dietary, but daily exercise is always included and is mandatory. Most doctors advise walking briskly for 30 minutes every day, but any aerobic activity can make your heart healthier. The American Heart Association recommends a minimum of "150 minutes per week of moderate-intensity and/or 90 minutes per week of vigorous cardio-respiratory exercise."^[22]

3.4.3 The relation between Diabetes and hypertension

Diabetes and high blood pressure tend to occur together because they share certain physiological traits - that is, the effects caused by each disease tend to make the other disease more likely to occur.

3.4.4 The potential benefits of aldosterone antagonism in Type 2 diabetes mellitus

Interest in the renin-angiotensin-aldosterone system (RAAS) has increased since the development of angiotensin-converting enzyme (ACE) inhibitors. It has been discovered that the potential uses of this class of treatment extend far beyond their initial developmental role as antihypertensives, and they are now used routinely in the treatment of heart failure, nephropathy, myocardial infarction and diabetes. However, there is more to RAAS blockade than just inhibition of angiotensin II, and inhibition of aldosterone is becoming recognised as an additional therapeutic manoeuvre in chronic heart failure. Since inhibition of the RAAS at the level of ACE is now seen to be an important therapy in diabetes; the purpose of this article is to explore the potential benefits of additional aldosterone inhibition in Type 2 diabetes mellitus.^[24]

3.5 Diabetes Mellitus and life styles

3.5.1 Physical inactivity

3.5.1.1 Staying active can:

- Increase insulin sensitivity.
- Improve lipid levels.
- Lower blood pressure.
- Aid weight management.
- Improve blood glucose management in type 2 diabetes and lower risk of CVD.^[25]

3.5.1.2 Clinical Intervention:

- Encourage your patients to find ways to fit activity into their daily routine. Examples include taking the stairs, parking further away, taking the stairs instead of elevator, or walking to another bus stop.
- Encourage patients to aim for at least 150 minutes/week of moderate aerobic exercise with no more than 2 consecutive days without exercise. If they are just starting out, encourage them to start with just 10 minutes, three times per day and build from there.
- Adults with type 2 diabetes should be encouraged to perform resistance training at least twice a week in the absence of contraindications.
- Many patients are motivated by wearing a pedometer and tracking their steps. Encourage them to join a walking group and challenge each other to more and more steps.^[25]

3.5.2 Diet

3.5.2.1 Healthy diet

If you have diabetes, your body cannot make or properly use insulin. This leads to high blood glucose, or blood sugar, levels. Healthy eating helps keep your blood sugar in your target range. It is a critical part of managing your diabetes, because controlling your blood sugar can prevent the complications of diabetes.

A registered dietitian can help make an eating plan just for you. It should take into account your weight, medicines, lifestyle, and other health problems you have.

- Healthy diabetic eating includes
- Limiting foods that are high in sugar
- Eating smaller portions, spread out over the day
- Being careful about when and how many carbohydrates you eat
- Eating a variety of whole-grain foods, fruits and vegetables every day
- Eating less fat
- Limiting your use of alcohol
- Using less salt^[26]

3.5.2.2 Unhealthy diet

Eating High Glycemic Index Foods Glycemic Index (GI) is the calculation of how fast a type of food consumed by us is turned into energy, i.e. into glucose. Foods that are turned quickly into glucose are High GI foods. Such foods tend to create extreme spikes in the blood sugar levels.

High GI Foods include common food items like:

- White bread
- Pasta
- Rice
- Candy
- Baked items or snack foods made from refined flour
- Pastries
- Carbonated drinks
- White potatoes
- Pasta
- Noodles
- Sugary cereal foods
- Instant, ready-to-eat food items

Such food items are also called Easy Carbohydrate Foods. These foods have minimal or absolutely zero fiber which makes it further easier for the body to digest them. Such, quickly-digested foods create a glycemic overload by inducing excessive sugar in the blood stream. This is also referred to as a Glycemic Load. The intake of such foods should be restricted.^[27]

3.5.3 Smoking

Smoking doubles your risk of getting heart disease. Stopping smoking is especially important for people with diabetes because both smoking and diabetes narrow blood vessels. Smoking also increases the risk of other long-term complications, such as eye problems. In addition, smoking^{can} damage the blood vessels in your legs and increase the risk of amputation.^[28]

3.6 Diabetes mellitus and aging

Both aging and diabetes are associated with a loss in function of the cardiovascular system. One commonly reported factor in both is a reduction in the ability of the peripheral vasculature to vasodilate normally, with the arm at rest, there is always both tonic vasoconstrictor and vasodilator tone to the vascular endothelial cells. In the skin, for example, there is a slow tonic release of norepinephrine, a vasoconstrictor, and acetylcholine, a vasodilator. If there is an increase in vasoconstrictor activity, then vasoconstriction predominates and if more vasodilator activity is present, then vasodilatation predominates. Thus, even reflex changes in blood flow can be modulated up or down by central sympathetic constrictor or dilator activity. In the present investigation, resting blood flow and the blood flow after

vascular occlusion was reduced with aging and diabetes. These results agree with that shown by others.^[29]

3.7 Diabetic complication

3.7.1 Nephropathy

3.7.1.1 Definition and causes

Diabetic nephropathy (DN) is typically defined by macroalbuminuria - that is, a urinary albumin excretion of more than 300 mg in a 24-hour collection or macroalbuminuria and abnormal renal function as represented by an abnormality in serum creatinine, calculated creatinine clearance, or glomerular filtration rate (GFR). (30)

3.7.2 Neuropathy

3.7.2.1 Symptoms

3.7.2.1.1 Peripheral symptoms

Peripheral neuropathy tends to develop slowly over months or years. In general, symptoms may include:

- Reduced feeling or numbness in the feet.
- Over time, tightness, burning, shooting, or stabbing pain in the feet, hands, or other parts of the body. Bone and joint deformities can develop, especially in the feet. Greatly reduced or greatly increased sensitivity to light touch or temperature.
- Weakness and loss of balance and coordination.^[31]

3.7.2.1.2 Autonomic neuropathy

Autonomic neuropathy may affect digestion, the body's ability to regulate temperature, urination, sexual function, and heart and blood vessel function, including blood pressure. Symptoms may get worse during pregnancy. In general, symptoms may include:

Frequent bloating, belching, constipation, heartburn, nausea and vomiting, diarrhea, and abdominal pain. These symptoms may point to gastroparesis, a condition that causes the stomach to empty much slower than normal.

3.7.3 Retinopathy

Eye damage (retinopathy). Diabetes can damage the blood vessels of the retina (diabetic retinopathy), potentially leading to blindness. Diabetes also increases the risk of other serious vision conditions, such as cataracts and glaucoma.^[32]

3.7.4 Foot damage

Nerve damage in the feet or poor blood flow to the feet increases the risk of various foot complications. Left untreated, cuts and blisters can become serious infections. Severe damage might require toe, foot or even leg amputation.^[32]

3.7.5 Skin or mouth conditions and osteoporosis

Diabetes may leave you more susceptible to skin problems, including bacterial and fungal infections. Gum infections also may be a concern, especially if you have a history of poor dental hygiene. Also, Diabetes may lead to lower than normal bone mineral density, increasing your risk of osteoporosis.^[32]

3.8 Diabetes and diabetic ketoacidosis

3.8.1 Definition

Diabetic ketoacidosis is a serious complication of diabetes that occurs when your body produces high levels of blood acids called ketones. Diabetic ketoacidosis develops when your body is unable to produce enough insulin. Insulin normally plays a key role in helping sugar (glucose) - a major source of energy for your muscles and other tissues - enter your cells. Without enough insulin, your body begins to break down fat as an alternate fuel. This process produces a buildup of toxic acids in the bloodstream called ketones, eventually leading to diabetic ketoacidosis if untreated.^[33]

3.8.2 Symptoms

Diabetic ketoacidosis signs and symptoms often develop quickly, sometimes within 24 hours. For some, these signs and symptoms may be the first indication of having diabetes. You may notice:

- Excessive thirst
- Frequent urination
- Nausea and vomiting
- Abdominal pain
- Weakness or fatigue
- Shortness of breath
- Fruity-scented breath
- Confusion^[33]

3.8.3 Causes

The most common events that cause a person with diabetes to develop diabetic ketoacidosis are:

- Infection such as diarrhea, vomiting, and/or high fever (40%),
- Missed or inadequate insulin (25%), and
- Newly diagnosed or previously unknown diabetes (15%).

Various other causes may include a heart attack, stroke, trauma, stress, alcohol abuse, drug abuse, and surgery. Approximately 5% to 10% of cases have no identifiable cause.^[34]

3.8.4 Medical treatment

- Fluid replacement and insulin administration intravenously (IV) are the primary and most critical initial treatments for diabetic ketoacidosis. These

therapies together reverse dehydration, lower blood acid levels, and restore normal sugar and electrolyte balance. Fluids must be administered wisely - not at an excessive rate or total volume due to the risk of brain swelling (cerebral edema). Potassium is typically added to IV fluids to correct total body depletion of this important electrolyte.

- Insulin must not be delayed and must be given promptly as a continuous infusion (not as a bolus - a large dose given rapidly) to stop further ketone formation and to stabilize tissue function by driving available potassium back inside the body's cells. Once blood glucose levels have fallen below 300mg/dL, glucose may be co-administered with ongoing insulin administration to avoid the development of hypoglycemia (low blood sugar).
- People diagnosed with diabetic ketoacidosis are usually admitted into the hospital for treatment and may be admitted to the intensive care unit.
- Some people with mild acidosis with modest fluid and electrolyte losses, and who can reliably drink fluid and follow medical instructions can be safely treated and sent home. Follow-up must be available with a health care practitioner. Individuals with diabetes who are vomiting should be admitted to the hospital or urgent care center for further observation and treatment.^[34]

3.8.5 Prevention

3.8.5.1 during illness

An underlying illness (usually an infection) is the most common reason why people with type 1 diabetes develop diabetic ketoacidosis (DKA). It's therefore important to take extra precautions if you fall ill.

You can use the advice below as a guide.

- Always seek prompt medical advice if you fall ill.
- Remember that some cough mixtures and cold remedies contain sugar. Always use the sugar-free variety.
- If eating normally is difficult, try soups or liquid carbohydrates which are available from many health and fitness stores.
- Drink plenty of sugar-free liquids. Seek immediate medical advice if you're unable to hold down soups or liquids.
- Continue with your insulin treatment even if you're unable to eat your usual amounts of food.

It's likely you will have to increase your insulin injections when you are ill. You should have received previous instructions about this, known as your 'sick day rules'.

Contact your GP or diabetic nurse for advice if you haven't received these instructions.

You will also need to check your blood glucose levels more frequently (usually at least four times a day).^[35]

3.8.5.2 Kenton testing

A simple urine test, using strips available on prescription, can test for ketones. You should test your urine for ketones if you have a high blood sugar level or if you have the symptoms of ketoacidosis.

Many newer blood glucose monitors are also able to monitor blood ketone levels. Your diabetic nurse will be able to provide you with more information about this.

Contact your GP or diabetes nurse immediately, or go to your nearest accident and emergency (A&E) department, if you have a blood sugar level and the test strips indicate that you also have high levels of ketones.^[35]

3.9 Diabetes and Disasters

During natural disasters, emergencies, and hazards people with diabetes face particular challenges to their health care.^[36]

3.10 Prediabetes treatment

Your treatment for prediabetes will focus on losing weight, eating healthy foods, and getting active. This is your chance to reverse prediabetes so it doesn't turn into type 2 diabetes. Doing these things will also help you avoid other health problems, such as heart disease and stroke that are linked to diabetes.

3.11.1.2 Hyperlipidemia

Check lipid profile - fasting or with direct LDL (annually)

- Prescribe at least a moderate potency statin in all patients with diabetes: men age 40 years or older and women age 50 years or older [IAd].
- While LDL target levels have not been clearly defined in trials, general recommendations are for LDL < 100 mg/dL.

3.11.1.3 Smoking

Check smoking status (at least annually). If non-smoker, reinforce nonsmoking.

• If a smoker

1. Educate about increased CV risk (diabetes + tobacco).
2. Encourage smoking cessation [IBd].

3.11.1.4 Cardiac Risk Reduction

- Many patients with diabetes will benefit from low dose aspirin therapy; however recent data are less

clear on the benefit of aspirin for primary prevention in patients with diabetes [IIAd]

and electrolytes within 1–2 weeks of initiating therapy.

3.11.2 Microvascular Complications 3.11.2.1 Retinopathy

Perform dilated retinal exam by eye care specialist [IBd] every 2-3 years if previous eye exam was normal and good glucose and BP control. Otherwise annually or more frequently as recommended by the eye care provider.

• If retinopathy

1. Treatment per ophthalmology [AId]
2. Consider improving glycemic and BP control [IAd].

3.11.2.2 Nephropathy

Check spot urinary albumin/creatinine ratio (annually) if not on an ACE/ARB and without diagnosis of diabetic nephropathy.

If > 30 mg/gm, check UA to rule out asymptomatic UTI.

Repeat spot urine ratio twice within 6 months. If 2 of 3 spot urine albumin/creatinine ratios > 30 mg/gm

1. Check creatinine, electrolytes and estimated glomerular filtration rate (eGFR) [IDg].
2. Begin ACE inhibitor or ARB [IAd] (if electrolytes allow use of ACE inhibitor). Recheck creatinine

3.11.2.3 Neuropathy

Perform foot exam: (1) inspect and check pulse (each visit if patient has a history of neuropathy; otherwise annually), and (2) monofilament (annually), see Table 10 [IBd].

If structural abnormality

1. Prescription for customized shoe and/or orthotics.
2. Consider podiatry referral.

If neuropathy

1. Optimize glycemic control [IAd].
2. Treatment of painful neuropathy if indicated.

If not sensitive to monofilament

1. Education regarding proper foot care and increased risk of ulceration.
2. Consider podiatry referral.

If foot ulcer:

1. Prescription for customized shoe and/or orthotics.
2. Aggressive wound care with close follow up.
3. Refer to a multidisciplinary team specializing in the care of diabetic foot ulcers [IAd]. (38)

3.12 Characteristics of the Common Types of Diabetes Table 1 Characteristics of the Common Types of Diabetes

The type	Type1	Type2
Age	Childhood	Pubertal
Onset	Acute; severe	Mild-severe; often insidious
Insulin secretion	Very low	Variable
Insulin sensitivity	Normal	decrease
Insulin dependence	Permanent	Temporary; may occur later
Racial/ethnic groups at increased risk	All (low in Asians)	African Americans, Hispanics, Native Americans, Asian/Pacific Islanders
Genetics	Polygenic	Polygenic
Proportion of those with diabetes	80%	10%-20%
Association: obesity	No	Strong
Acanthosis nigricans	No	Yes
Autoimmune etiology	Yes	No

Chapter (4)

4. Methods and material:

4.1. Study Design

This study will be community and facility based cross sectional study in Dahda Area and its primary health care to identify the risk factors that lead to diabetes mellitus. Also, this study will use non-probability sampling.

4.2 study Population

The target group for this study will be the old Saudi people above 40years in Dahda Area at their homes and the people who will visit the Dahda Health Care. In addition, this study will be concentrated on both of old male and female.

4.3 study Area

Najran is one of the most popular cities in the Kingdom of Saudia Arabia and located in Southern region of KSA between latitude 17–20 North and longitude 44 –52 East with an area of 365,000 km² and population density according to the year 2004 census is 298,288. Najran is a valley which extends from the beginning of Najran Dam to the end of the Empty Quarter Desert. Also, it was an ancient and traditional city, so it contains the groove that mentioned in AL-Quran.

4.4 Sampling

4.4.1 Frame

Sampling will be done at Dahda area in its primary health care center and by visiting peoples' homes.

4. 4.2 Population Unit

Male and female people above 40 years old with diabetes mellitus in Dahda primary health care center in Najran city.

4. 4.3 Sampling Design

It is by non-probability sampling including selective and purposive patients. The selective sampling techniques will be using for the selection of 55 patients.

4.2 Methods of Data Collection

4.2.1 Tools of Data Collection

Tools of data collection will include direct interview (questionnaires, check lists) which will be filled by the volunteer of the diabetic patients above 40 years who will visit the Dahda health care center and indirect interview (interviews) by visiting some patients at homes.

4.2.2 Study Variables

Family history will be measured by present or not.

1. Obesity will be measured by BMI.
2. Exercise will be measured by present or not (how many times).
3. Pregnancy will be measured by number of parity.
4. Hypertension will be measured by a sphygmomanometer.

4.3 Methods of Data Analysis

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

Chapter (5)

5. Results:

- 5.1 As shown in table 2 the family history has a relation with the diabetes mellitus as it affect 72.72% of diabetic patients and just 27.28% are not affected.
- 5.2 The result present in table3 showed that the obesity is absent in 63.64 %, but it is present in 36.36%
- 5.3 As shown in figure 1, the physical inactivity lead to the diabetes mellitus in 81.81% while 18.19 is not affected.
- 5.4 The pregnancy affects 12.72% and not affects 87.28% of the diabetic women as in figure 2.
- 5.5 The figure 3: effect of hypertension on diabetes mellitus in Dahda is 16.36% while 83.64% not affected.

TABLE 2: Role of family history in diabetes mellitus at Dahda Area:

Family history	Number	%
Affect	40	72.72%
Not affect	15	27.28%
Total	55	100%

TABLE 3: Role of obesity on diabetes mellitus In Dahda Area:

Obesity	Number	%
Male	5	9.09%
Female	15	27.27%
Total	20	36.36%

Figure1: the effect of exercise on diabetes mellitus:

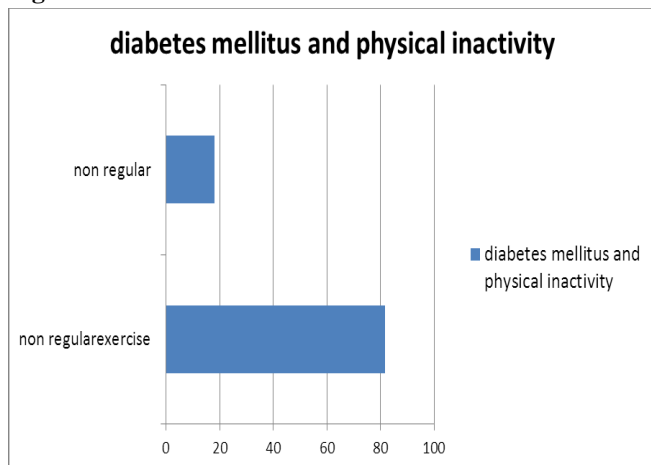


Figure 2: The effect of pregnancy on diabetes mellitus:

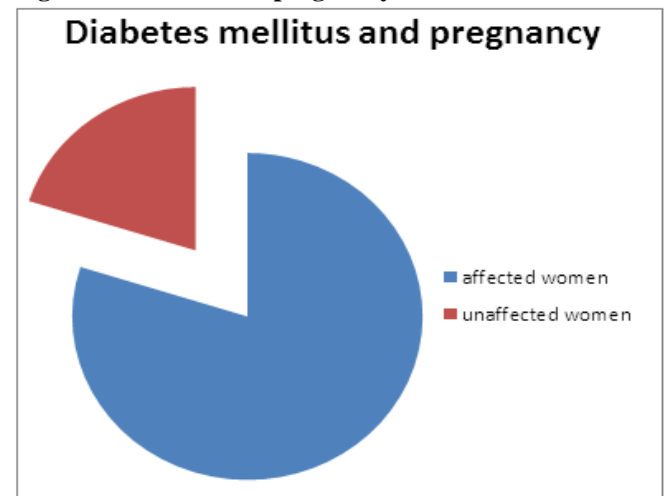
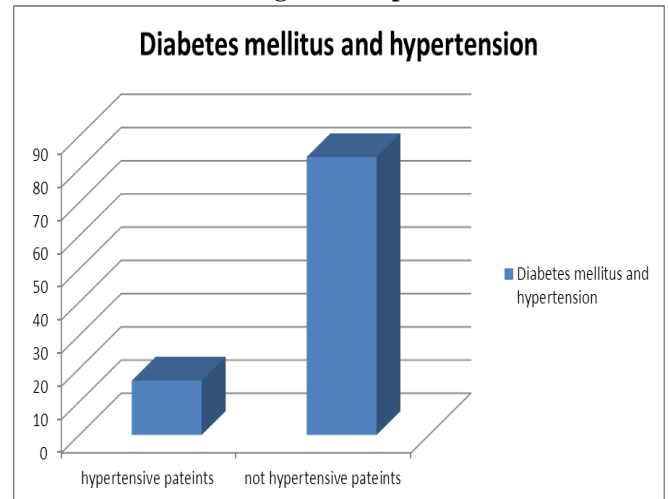


Figure 3: The relation between hypertension and diabetes mellitus among diabetic patients at Dahda area:



Chapter (6)

6. Discussion

This study shows that family history has a strong relation with the diabetes mellitus by affecting 72.72% of diabetic patients this is due to union of individuals who having a common ancestor (consanguinity marriage). While the physical inactivity is the most important factor leading to diabetes mellitus at people in Dahda Area that is because

most of them have no any exercise. In addition, the obesity has also role to cause diabetes mellitus due to high intake of fatty diets. This study shows also that the pregnancy can lead to diabetes mellitus especially in women Are overweight or obese and more than 25 years old and those women had a baby born weighing over 9 pounds or Have a family history of diabetes. Also, this study suggests that the stress can cause diabetes mellitus.

Chapter (7)

7. Conclusions:

- 7.1 It is found that the family history can cause diabetes mellitus among 40 to 60 years old
- 7.2 It is found that the most obese people can be affected is female patients among 40 years
- 7.3 It is found that the pregnant who affected is those had a family history of diabetes.
- 7.4 It is found that the stress can cause diabetes mellitus.
- 7.5 It is found that most diabetic patients have no physical activity.

Chapter (8)

8. Recommendation:

In this study we recommended that people must practice the sports at least one hour each day to control the diabetes mellitus or to prevent occurrence of diseases. In addition, they must eat the healthy diet and avoid the fatty food while they should reduce their weights if they are obese. Also, they are in a need to consult a physician to control their diabetes.

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