

Audit of Services Provided to Diabetic Patients at Algadid Althawra (1) Health Centre and Factors Related to them - 2013

Dr. SALIM AHMED MOHAMED ELHASSAN
M.B.B.S Cluj-Napoca University, Romania
Department of Family Medicine and Community Medicine
Faculty of Medicine, Gezira University, Sudan

Abstract:

The objective of this study is to audit services provided to diabetic-patients at Algadid Athawra (1) Health centre and factors related to them.

The study is retrospective and audit community-based study. random systemic sampling from EMR survey which is conducted in Algadid Athawra (1) catchment area using random sampling 100 subjects males and females all of ages in the period of January 2012- January 2013.

Structured questionnaire and Electronic medical record were used. The results showed of diabetes mellitus among Algadid Althawra (1) population is 4.35% (EMR), the ratio of male/female, female affected with diabetes mellitus are more than men 71% / 29%. This may be due to female were more attended to health center than men. Obesity is common in Algadid Athawra (1) 43% were overweight (BMI 25-29.9%). 29% were moderate obese (BMI 30-34.9%) .4% over obese (BMI 35-39.9%) and 2% severe obese (BMI \geq 40%), high number of patients were not controlled or poorly controlled (HbA1C > 10% and 40% well controlled).

The awareness of the participant about diabetes mellitus complications is very high (>90%). Checklist, building, manpower, furniture and equipments were reasonably accepted at the level of family medicine health center, according to standard criteria of federal ministry of health.

Key words: diabetic patients, services, Algadid Althawra Health Centre

Introduction:

Diabetes Mellitus is a disorder caused by the total (or relative) absence of insulin, which manifests clinically as an elevated blood glucose. The classification of diabetes mellitus has been a major discussion point over the last few years. It has been increasingly recognized that the old classification system based upon a patients' dependence on insulin was misleading; under the old system patients were either classified as either Insulin Dependent Diabetes Mellitus (IDDM) or Non Insulin 2 Dependent Diabetes Mellitus (NIDDM). In 1998, a new classification system based upon the etiological factors at work in diabetes was proposed by the WHO and we have listed it below: this has now become the accepted system for classifying diabetes mellitus.

Type 1 diabetes: Type 1 diabetes is the form of the disease that occurs primarily as a result of β -cell destruction. The American Diabetes Association (ADA) and the World Health Organization (WHO) have proposed that Type 1 diabetes is classified into two categories, i.e. immune-mediated (autoimmune) and idiopathic[1,2]. In autoimmune Type 1 diabetes, the rate of cell destruction is quite variable, being rapid in some individuals and slow in others[3]. Markers of immune destruction, including islet cell auto antibodies (ICA), auto antibodies to insulin (IAA), auto-anti bodies to glutamic acid decarboxylase (GAD65), and auto antibodies to tyrosine hosphatases IA-2, are present in 85-90% of individuals with Type 1 diabetes when fasting diabetic hyperglycemia is initially detected[3]. The rapidly progressive ('classic') form is commonly observed in children, but may also occur in adults [4]. The

slowly progressive form generally occurs in adults and is sometimes referred to as latent autoimmune diabetes in adults (LADA). This term has been commonly used in the last decade to refer to autoimmune forms of diabetes that do not initially require insulin. However, it is now clear that diabetes in these patients is not latent and is not limited to adults.

Type 2 diabetes: disease of adult onset, which may originate from insulin resistance and relative insulin deficiency or from a secretory defect. This is a disease, which appears to have a very strong genetic predisposition and is caused by a combination of inadequate insulin secretion and an insensitivity of the body tissues to insulin so leaving patients with this condition relatively deficient in insulin.

Type 2 DM is preceded by impaired (elevated) fasting blood glucose (IFG) - a pre-diabetes state which can exist undetected for many years, causing irreversible damage to the kidneys, eyes and nerves. Impaired Glucose tolerance (IGT), similar to IFG, has a prevalence rate of 7.1% in Nigeria. The fasting glucose level of a normal individual should not exceed 109 mg/dl of blood. Values between 110mg/dl and 125mg/dl of blood are categorized as IFG, i.e. prediabetes, while values over 126mg/dl are classified as DM.[2]

Type 3 diabetes: this covers a wide range of specific types of diabetes including various genetic defects in insulin action, and diseases of the exocrine pancreas.

Type 4 diabetes is gestational diabetes [3]. Primary Health Centres are the cornerstone of rural health services- a first port of call to a qualified doctor of the public sector in rural areas for the sick and those who directly report or referred from Sub-centres for curative, preventive and promotive health care. A typical Primary Health Centre covers a population of 20,000 in hilly, tribal, or difficult areas and 30,000 populations in plain

areas with 4-6 indoor/observation beds. It acts as a referral unit for 6 sub-centers and refer out cases to CHC (30 bedded hospital) and higher order public hospitals located at sub-district and district level.[5]

Standards are the main driver for continuous improvements in quality. The performance of Primary Health Centers can be assessed against the set standards In order to provide optimal level of quality health care, a set of standards are being recommended for Primary Health Centre to be called Indian Public Health Standards (IPHS) for PHCs. The launching of National Rural Health Mission (NRHM) has provided this opportunity. The standards prescribed in this document are for a PHC covering 20,000 to 30,000 populations with 6 beds.[5]

Standards are a means of describing the level of quality that health care utilization are expected to meet or aspire to. Key aim of these standards is to underpin the delivery of quality services which are fair and responsive to client's needs, which should be provided equitably and which deliver provident in the health and wellbeing of the population. Standards are the main driver for continuous improvements in quality. The performance of health care delivery organizations can be assessed against the set standards. The National Rural Health Mission (NRHM) has provided the opportunity to set Indian Public Health Standards (IPHS) for Health Centers functioning in rural areas

Rationale:

- DM is a growing health problem worldwide.
- The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 20301.[5].
- Diabetes is associated with long-term complications and often leads to blindness, stroke, renal failure, and amputations. Heart disease and stroke cause about 65 percent of deaths among people with diabetes.

- The ultimate goal of quality measurement in diabetes is to motivate quality improvement and decrease long-term diabetes complications. There is evidence that some improvements in processes of care were motivated by the quality monitoring process itself, especially when incentives for better performance were incorporated.[8]

Literature Review:

The epidemiology of diabetes:

During the last twenty years the prevalence of diabetes has increased dramatically in many parts of the world and the disease is now a worldwide public health problem.

In Mongolia, diabetes mellitus represents a real and growing public health threat. Diabetes prevalence in 2009 was 9% in urban areas and 4% in rural regions. At the same time, pre-diabetes (IFG) was at 12% and 7.3% respectively [6].

The disease of diabetes is one of the important problems of the world and the number of patients suffering from it, is growing day by day.[7]

In January 2011 the World Health Organization (WHO) recommended that glycated hemoglobin (HbA1c) could be used as an alternative to standard glucose measures to diagnose type 2 diabetes among non-pregnant women and adults. HbA1c levels of 6.5% or above indicate that someone has type 2 diabetes – but there is no fixed point to indicate when someone has 'pre-diabetes'. (Increasing levels of HbA1c, up to the 6.5% cut-off point, mean someone is at increasing risk of type 2 diabetes.)[9].

Originally set out to address the prevention of 'pre-diabetes' among adults aged 18–74 in communities at high risk of developing type 2 diabetes. The second set out to focus on preventing the progression from that sub-Saharan Africa will see an increase of 98.1% in the prevalence of diabetes over the period 2010–2030, the largest increase of any region [10]

The actual number of people with diabetes in Sudan is not known. A small population-based study in 1993 of a sample of 1284 adult men, showed a prevalence of 3.4% of type 2 diabetes.[11]

The influence of environmental factors in the cause diabetes needs to be mentioned.

In Sudan, diabetes is the commonest cause of hospital admissions due to a non-communicable disease. One study showed that people with diabetes constituted 7% of all hospital admissions, a value higher than that reported for other African countries. Diabetic ketoacidosis (DKA) is the principal cause of hospital admissions, being precipitated by poor compliance to therapy or diet, and infections, particularly malaria.

Type 2 diabetes is associated with an overall age-adjusted mortality that is about twice that of the non-diabetic population and the life expectancy is reduced by 5–10 years. Currently, diabetes in Sudan (and most of Africa) is believed to have one of the highest mortality rates for a non-infectious disease. One study indicated that 10% of adult patient deaths in hospitals were caused by diabetes. This figure may be underestimated as patients who died at home or were unable to reach hospital due to lack of transportation or economic constraints were not included. Acute complications, especially DKA, are the commonest cause of diabetes-related mortality in Sudan. There is a delay in recognition of early signs of DKA (and therefore treatment) due to doctors being unaware or due to self-treatment of the precipitating factors such as malaria. Other major causes of death include septicemia (secondary to septic foot) and end stage renal disease.[12]

The study showed that 60% of the patients were male, and 40% were female. Those who have type 2 diabetes mellitus were 77 patients while 23 patients have type 1 diabetes mellitus. It was shown that 76% of the patients were resident in Khartoum, 12% in central, 5% in the north, 4% in the east, and 3% in the west. It appeared that patients of age group

distribution 15-24 years constitute 9%, 25-34 years were 6%, 35-44 years equivalent to 10%, 45-54 years were 25%. 55-64 years were 21%, and more than 65 years were 29%. It was found that 21 patients had diabetes for 1-4 years and 13 patients for 5-10 years while 66 patients had diabetes for more than 10 years. Almost 71% of the patients had family history of diabetes. The prevalence of neurological complications among Adult Sudanese diabetic patients – Hussein et al diabetes. Polyuria was observed in 79%, polydipsia in 78%, weight loss in 62%. Itching in 22%, diarrhea in 24% of our patients. Sweating disturbances were found in 24% of the patients, palpitations in 19%, numbness in 21%, impotence in 15%, dizziness in 5% and urinary symptoms were found in 5% of the patients. It was found that 62% of the patients were reported to have diabetic neuropathy, most of them had diabetes for more than 10 years (65%) and most of them were not on regular medication or regular follow up.[13]

Clinical Features and Etiology:

In Sudan and other African countries the growing wave of urbanization has altered many people's lifestyles. These lifestyle changes include the increased use of motorized vehicles, little or no time devoted to regular exercise, too many sedentary hours watching TV and large amounts of sugar, refined cereals and fat consumed instead of the healthy traditional foods. For many people, obesity is highly desirable as it is seen as a sign of strength and affluence in men and beauty and attractiveness in women. Physical under activity and obesity resulting from these factors are known predisposing factors for diabetes. Consequently, diabetes is now one of the major health problems in Sudan resulting in 10% of all hospital admissions and mortality.[11]

Type 1 diabetes typically presents in the teens with a short history of weight loss, incredible thirst and polyuria

(passing lots of urine). Such patients are often thin, there is very often no family history of diabetes and although the cause of the illness is not known, it is thought to be triggered by a viral infection.

Obesity — Type 2 diabetes mellitus is strongly associated with obesity in all ethnic groups. More than 80 percent of cases of type 2 diabetes can be attributed to obesity, which may also account for many diabetes-related deaths.

A curvilinear relationship between BMI and the risk of type 2 diabetes was found in women in the Nurses' Health Study [42, 43].

The chronic complications of diabetes:

These are the complications that occur because of the chronic exposure of the body's tissues to hyperglycemia, hypoinsulinaemia or their associated metabolic disturbances. The potential chronic complications of diabetes are those that most people with diabetes fear; however over 40% of patients with type 1 diabetes survive for over 40 years after the disease has been diagnosed, half of them without developing significant complications.

The chronic complications of diabetes are classified as follows:

1. Micro vascular (microangiopathic)

Diabetic Retinopathy.

Diabetic Neuropathy.

Diabetic Nephropathy.

Diabetic skin problems (the "Diabetic foot")

2. Macrovascular .

Accelerated propensity to atherosclerosis/atheroma

Peripheral vascular disease/ coronary heart disease.

Myocardial infarction.

Arteriosclerosis.

Hypertension and cerebrovascular disease.

3. Other associated metabolic abnormalities.

Hypercholesterolaemia.

4. Increased accessibility to infections.

For reasons not totally understood people with diabetes have an increased susceptibility to bacterial infection. This is an important factor in the development of diabetic foot ulceration and explains why people with diabetes have a much higher risk of limb amputation compared to the normal population[4]

Diagnosis of diabetic mellitus:

The diagnosis of diabetes mellitus is made by finding a fasting blood glucose of over 6.7mmol/l or a random glucose of 10mmol/l. If a patient presents with symptoms of diabetes and is found to have a single very high glucose measurement eg 15mmol/l then this can be diagnostic. More commonly it would be appropriate to ask the patient to fast overnight and attend for a fasting blood glucose to be taken the next morning. Ideally this should be performed on two occasions before diagnosing diabetes. If there is any doubt about the diagnosis then a further test can be performed. This test is called the oral glucose tolerance test and it measures how the body responds to a glucose load. The patient is asked to fast overnight and then attends for the test. The patient has a blood glucose level taken and is then given a drink, which contains 75gm of glucose. After two hours another blood sample is taken. From the results of the glucose tolerance test the patient can be either diagnosed as having diabetes, impaired glucose tolerance or no abnormality of glucose handling.[3]

Treatment of diabetes mellitus:-

Essentially the management of diabetes can be classified into 4 areas:

1. Psychological/ social support for patients who may have many specific needs arising from a range of disabilities.
2. Treatment of the primary disturbance of blood sugar, this encompasses ways in how the treatment is monitored.
3. Address other cardiovascular risk factors, particularly hypertension, hypercholesterolemia, smoking.
4. Treatment of diabetic complications.

The aim and purpose of treating a patient with type 1 diabetes is fundamentally different to that of a patient with type 2 diabetes.

The patient with type 1 diabetes has lost the ability to produce insulin and is therefore dependent upon externally administered insulin.

The treatment of patients with type 2 diabetes:

Managing DM and its complications is very costly. Many studies have shown that control of hyperglycemia in diabetic patients can prevent or reduce the risks of diabetic complication [5]

Patients with type 2 diabetes have some residual insulin production of their own and therefore will survive, at least a short time without insulin. The underlying problem with patients who have type 2 diabetes is that they don't produce enough insulin for their needs. The patient with type 2 diabetes is in a state of relative insulin deficiency.

The shortfall in insulin production can be made up in one of two ways, tablets or insulin. In treating type 2 diabetes, you start with one type of tablet, if that fails to control the blood sugar adequately add the other type of tablet. If the blood sugar is still not controlled one has to resort to insulin. [4]

Routine foot examination

Foot problems due to vascular and neurologic disease are a common and important source of morbidity in diabetic patients. Systematic screening examinations for neuropathic and vascular involvement of the lower extremities and careful inspection of feet may substantially reduce morbidity from foot problems.

Guidelines from the American Diabetes Association recommend performing a comprehensive foot examination annually on patients with diabetes to identify risk factors predictive of ulcers and amputation[19]. The comprehensive foot examination can be accomplished in the primary care setting and should include inspection, assessment of foot pulses, and testing for loss of protective sensation.

Screening for microalbuminuria

Increased urinary protein excretion is the earliest clinical finding of diabetic nephropathy. The routine urine dipstick, however, is a relatively insensitive marker for proteinuria, not detecting protein until excretion exceeds 300 to 500 mg/day [20]. Values above 300 mg/day (200 mcg/min) are considered to represent overt proteinuria[21].

The availability of effective therapy for diabetic nephropathy with angiotensin-converting enzyme (ACE) inhibitors and angiotensin II receptor blockers (ARB) is the rationale for yearly screening of all patients with either type 1 or type 2 diabetes for microalbuminuria[22].

Screening for microalbuminuria can be deferred for five years after the onset of disease in patients with type 1 diabetes because microalbuminuria is uncommon before this time; some recommend that screening should begin at diagnosis in patients with type 2 diabetes because many have had diabetes for several years before diagnosis [19].

Screening for coronary heart disease

Coronary artery disease risk factors identified by the American Diabetes Association (dyslipidemia, hypertension, smoking, positive family history of early coronary disease, and presence of micro- or macroalbuminuria) [23] do not predict the likelihood of having ischemic findings on stress testing or coronary angiography [24,25].

The guidelines recommend annual assessment of risk criteria to identify patients who might benefit from interventions such as aspirin, ACE inhibitors, and statin therapy, but no longer recommend that these criteria be used to identify patients for stress testing[19].

Reducing the risk of macrovascular disease

Men and women with diabetes are at increased risk for developing and dying from cardiovascular disease (CVD)[26,27]. Compared with nondiabetics, men and women with diabetes have decreased life expectancy (six to eight years less). At the time of diagnosis of type 2 diabetes, many patients already have one or more risk factors for macrovascular disease (obesity, hypertension, dyslipidemia, smoking) and many have evidence of overt atherosclerosis (past myocardial infarction, ischemic changes on electrocardiogram, or peripheral vascular disease)[30,28,29].

With regard to cardiovascular disease risk reduction among patients with type 2 diabetes, the benefit of good blood pressure control has been confirmed, whereas benefit from strict glycemic control has not been conclusively demonstrated[41]. Among patients with type 1 diabetes, the DCCT/EDIC study demonstrated long-term benefit of intensive glycemic management on cardiovascular outcomes, reducing fatal and nonfatal heart disease and stroke by 57 percent compared with conventional diabetes management [31].

Smoking cessation

A survey in the United States found that the prevalence of cigarette smoking was higher among diabetic patients than non-diabetic subjects, even after adjusting for age, sex, race, and educational level[32]. Over 25 percent of newly diagnosed diabetic patients were smokers. A meta-analysis of many of the cardiovascular risk reduction trials showed that cessation of smoking had a much greater.

Blood pressure control

Hypertension is a common problem in type 1 and especially in type 2 diabetes. The American Diabetes Association recommends measuring blood pressure at every routine diabetes visit [19,33]. Early and effective treatment of blood pressure is important, both to prevent cardiovascular disease and to minimize the rate of progression of diabetic nephropathy and retinopathy.

Dyslipidemia

Lipid abnormalities are common in patients with diabetes mellitus, and undoubtedly contribute to the increase in risk of cardiovascular disease. The American Diabetes Association (ADA) recommends screening for lipid disorders at least annually in diabetic patients, and more often if needed to achieve goals [19, 33].

The ADA recommends lifestyle intervention (diet, weight loss, increased physical activity) to improve the lipid profile in all patients with diabetes[19].

Multifactorial risk factor reduction

The benefit of multiple risk factor intervention to reduce coronary risk in type 2 diabetes was demonstrated in the relatively small Steno-2 trial of 160 subjects with microalbuminuria who were randomly assigned to either conventional therapy or an intensive therapy regimen, which included the following [34]:

- Reduced dietary fat
- Light to moderate exercise
- Smoking cessation
- Tight glycemic control (target A1C <6.5 percent with intensive therapy)
- Tight blood pressure control (target <140/85 mmHg for most of the study and <130/80 mmHg for the last two years)
- Angiotensin converting enzyme (ACE) inhibitor therapy regardless of blood pressure
- Lipid-lowering therapy (target total cholesterol <190 mg/dL [4.9 mmol/L] for most of the study and <175 mg/dL [4.5 mmol/L] for the last two years; target fasting serum triglyceride <150 mg/dL [1.7 mmol/L])
- Aspirin
- Vitamin C, vitamin D, folate, and chrome picolinate

Glycemic Control

Monitoring and target A1C

Prospective, randomized clinical trials such as the Diabetes Control and Complications Trial (DCCT), the United Kingdom Prospective Diabetes Study (UKPDS), and the Kumamoto Study have demonstrated that intensive therapy aimed at lower levels of glycemia results in decreased rates of retinopathy, nephropathy, and neuropathy [35, 36].

Nonpharmacologic therapy in type 2 diabetes

There are three major components to nonpharmacologic therapy of blood glucose in type 2 diabetes. Dietary modification, exercise and weight reduction. In addition to improving glycemic control, these changes in lifestyle also slow progression of impaired glucose tolerance to overt diabetes [37].

Dental screening

Periodontal disease is a common complication of diabetes and itself contributes to poor glycemic control. Severe periodontal disease was shown to be an independent risk factor for mortality from ischemic heart disease and nephropathy in one longitudinal study of Pima Indians with type 2 diabetes [38]. Annual dental examination is recommended in both dentate and non-dentate diabetic patients [39]. In a 2004 US survey, 67 percent of respondents with diabetes reported a dental visit in the preceding 12 months [40].

Objective

To assess infrastructure of the health centre, and the awareness of the participants about the disease, and risk factors.

Materials and Methods

Research Design:

It is descriptive community- based and health facility study aiming at auditing services provided to diabetic patients and different factors related to them.

The Study Area:

Algadid Althawra (1) Alkamleen, Aljazeera state Alsinaat administrative unit, North part of Gezira state. Located 40 km South Khartoum and 4 km to Giad, surrounded from East by

Blue Nile and Khartoum Medani high way street , from West by railway national line from North by Albager Cotton Factories from the South Algadid Althawra(2). It is about 4km square. Electricity, safe water supply and education facilities are available.

Study population:

The total number of population at Algadid althawra (1) is about 5000. The population pyramid shows that large number of population is middle aged. Most of the tribes are Roufaa (the majority) and Mahas, urbanization lifestyle is found there. The community very helpful and community participation is obvious in Algadid Athawra (1) Health Center. The number of diabetic patients recorded is 185. The number of patients that in regular follow up 130.

Health services provide in Algadid Athawra (1) Health center (Child Health –Antenatal care –Follow up of Chronic diseases communicable and non communicable diseases – Conducted among family physician.

The target populations: 100 Diabetic patients both sex with different ages selected systemic randomly from electronic medical record.

Sample Collection:

100 patients were selected from the village through systemic random sampling (chose 3 patients form electronic medical record and omit one).

Methods of Data Collection:

The data was collected by using validated structured questionnaire of patients were effected with diabetes mellitus disease, Checklist, Electronic medical records.

Results :

The following are results representing 100 diabetic patients at Algadid Althawra (1) village using structured questionnaire and the electronic medical records for the same patients although an audit checklist was used.

a) Data from Electronic Medical Records:

Table (1): Distribution of diabetic patients in Algadid (1) According to BMI (EMR)

BMI		
	Frequency	Percent
< 18.5 under weight	1	1%
20-24.9 Normal	21	21%
25-29.9 overweight	43	43%
30-34.9 moderate obesity	29	29%
35-39.9 over obesity	4	4%
40 very sever obesity	2	2%
Total	100	100%

Table (2): Hypertension among diabetic patients in Algadid Althawra (1) (EMR)

Bp		
	Frequency	Percent
yes	26	26%
no	74	64%
Total	100	100%

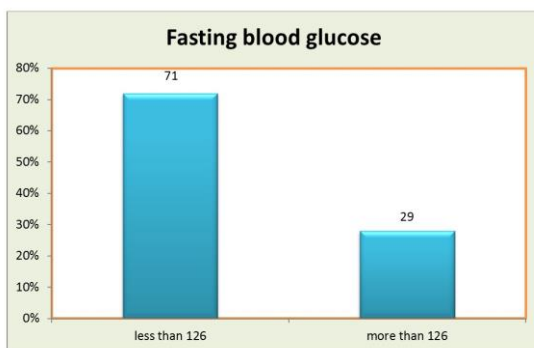


Table (3): Health insurance among diabetic patients in Algadid (1)

Insurance		
	Frequency	Percent
yes	72	72%
no	28	28%
Total	100	100%

N=100

Table (4): Smoking among diabetic patients in Algadid (1)

Smoking		
	Frequency	Percent
yes	7	7%
no	93	93%
Total	100	100%

N=100

Discussion

This is cross-sectional, retrospective and audit services study conducted in Algadid Althawra (1). The study attempted to assess the factors affecting diabetic patients and evaluation of services provided for diabetic patients in the health center.

Findings of the current study revealed that, the highest age group of patients affected with DM was 40 - 60 years and they represented 65%. Compare with study done by Abbashar Hussein appeared that patients of age group distribution /between 45-54 years were 25%. 55-64 years were 21%, and more than 65 years were 29%.which approximately same comparable [13].

Females predominated in this study representing 71%, while males represented 29%, male to female ratio was 1: 2.5 compare with study done by Abbashar Hussein his study showed that 60% of the patients were male, and 40% were female(13).which may be due to female seek medical care more than male.

The current study showed that 85% had family history of diabetes, compare with abbashr Hussein which showed in his study Almost 71% of the patients had family history of diabetes

(13).which indicate strong family history affecting diabetic patients.

The vast majority of diabetic patients in our catchment area were not smokers 93%. Only 7% were smokers. Several large prospective studies have raised the possibility that cigarette smoking increases the risk of type 2 diabetes. A survey in the United States found that the prevalence of cigarette smoking was higher among diabetic patients than non-diabetic subjects [32]. Here in Sudan due to habits and religion wise cigarette smoking is not acceptable.

Most of patients found to have high BMI and this is a risk factor for diabetes mellitus age group as a study.

Regarding BMI (body mass index), 43% of diabetics patients were overweight. 29% were moderate obese, 4% were over obese. 2% were severely obese, 21% within the normal weight and only 1% under weight. Other studies similar to this study revealed that type 2 diabetes mellitus is strongly associated with obesity in all ethnic groups. More than 80 percent of cases of type 2 diabetes can be attributed to obesity [42, 43].

Diabetics patients associated with increase blood pressure (hypertension) were 26% other 74% they have normal Bp. Association of blood pressure with diabetes mellitus is revealed in many studies [19, 33].

Most of diabetic patients in the study (69%) `respect regime of diet .24% were occasionally and 7% were poorly respecting regime of diet, while 58% of diabetics patients practice exercises .20% occasionally , 20% were not practices exercises. Although percentages of patients who respect regime of diet and practicing exercise were satisfying, but increasing the awareness and culture of diet regime and sport among public will help increasing the percentage. Most of diabetic found to take care of their foot (72%), 16% occasionally, other 12% are ignore this action. Respecting oral hygiene and dental care is found high where 93% of study population mentioned

that they always respect oral hygiene and only 4% of them occasionally take care of their mouth health. The two major risks factors facing diabetic patient in Sudan were respecting diet regime and taking medication regularly, in this study 85% had a regular medication administration, 3% occasionally and 10 do not use medication. There was no knowledge towards vaccine of flu and pneumonia among diabetic patients. And they don't use it.

Regular check up for blood glucose, urine and knowledge towards diabetes mellitus complication (CNS, Renal, eyes, Cardiac and peripheral arterial disease) were found high among the study population (89% and 90% respectively). On the other hand, investigation of cholesterol, ECG and renal function test were done by nearly half or more of study population; (53%, 55%, 57% respectively). Third of diabetic patients investigate HBA1C 30%). When patients inquired about satisfaction of services provided in the health center, vast majority of them answered positively.

Conclusion

The study revealed that most of the diabetic patients were having a high BMI, the majority of them were females, most of the patients in the age group of 40 to 65 years, most of the patients were having a family history of the disease and all of these are risk factors of DM. It was noticed that the community were having a good participation in supplying the health centre with needed infrastructure and medical equipments. Awareness towards diabetes mellitus in the studied group was high, but practice was low. Smokers were few, and the majority covered by the health insurance. High numbers of diabetic patients were poorly controlled.

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