



Review article

Diabetes mellitus among patients attending selected General Hospitals in Niger State, Nigeria: a review

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SUMMARY

Diabetes is known to be a chronic, life-threatening condition indicated by high blood sugar brought on by abnormal β -cell biology, which compromises the effectiveness of insulin. The prevalence of Diabetes mellitus among the populace has skyrocketed in recent years with about half of those affected going undiagnosed. The burden of the disease's comorbidities is increasing along with the disease's rising incidence. Communities that were not previously identified as having these challenging health conditions are now experiencing notable incidences of amputations related to diabetes mellitus, cerebrovascular illness, heart-related problems, and renal disease.

Keywords: Diabetes mellitus, Prevalence, hyperglycemia, ketoacidosis, Insulin, Risk factor

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INTRODUCTION

Diabetes is a chronic metabolic disease characterized by an increase in glucose in the blood. Over time, diabetes can cause serious damage to the eyes, kidneys, nerves, arteries and heart. The most common type 2 diabetes is usually fatal in adults due to insufficient or resistant responses to insulin. Chronic diseases known as Type 1 diabetes occur when the pancreas produces very little insulin alone. According to estimates from the

International Diabetes Federation (IDF), 537 million people around the globe were having diabetes in 2021, leading to medical expenses of US\$966 billion globally, with estimates indicating that this number would rise to a little more than \$1054 billion by 2045 [1,2]. Diabetes represents a significant burden on healthcare systems [3]. According to the 2016 Non-Communicable Disease (NCD) Risk Factor Collaboration (NCD-RisC) findings, there is less than 1% chance that worldwide targets to stop increasing

incidences of diabetes would be met by 2025 for women and even less for men [4]. Additionally, according to GBD 2019, diabetes is a major factor for stroke and ischemic heart disease, which are the top two causes of global disease burden [2] and the main cause of heart disease (The Emerging Risk Factors Collaboration, 2010). The two most prevalent types of diabetes, type 1 and type 2, are identified using recognized diagnostic standards [5]. Though preventive and control strategies differ based on the type of diabetes, there are effective approaches to reduce its impact [5]. Among these tactics are reducing the risk factors for type 2 diabetes, increasing insulin accessibility, and enhancing the healthcare system's infrastructure. [5,6].

Types of Diabetes Mellitus

Insulin is a key component in the metabolic disease known as diabetes. The aetiology of this condition involves multiple pathogenic mechanisms. They range from an illness that prevents insulin from acting to the autoimmune destruction of pancreatic beta cells, which causes chronic insulin insufficiency [7].

Type I Diabetes Mellitus

Type 1 diabetes is also known as insulin dependent diabetes. An autoimmune reaction in which the body attacks cells that produce insulin causes type 1 diabetes mellitus (T1DM) [7]. Patients with type 1 diabetes have varying rates of beta cell disintegration; some have very rapid rates, while others have very slow rates. For the majority of patients, keto-acidosis is the most typical early sign of the condition. Others display signs like hyperglycemia during fasting and keto-acidosis when exposed to certain environmental factors. Many people eventually become insulin-dependent and

experience keto-acidosis, even though some may maintain enough beta-cell activity to prevent it. As the illness worsens, less insulin is produced, and C-peptide levels drop until they are frequently undetectable.

Type 2 Diabetes Mellitus

Type 2 diabetes mellitus affects (90–95) % of people with diabetes (T2DM). The underlying issue with T2DM is a delicate balance between beta cell synthesis of insulin and its effect, which results in insulin resistance to insulin-stimulated blood glucose. Impaired glucose tolerance, the intermediate stage of the illness, is what defines the risk of heart disease [7]. Since many T2DM patients are fat, it is possible that obesity contributes to insulin resistance in some way. Keto-acidosis occurs in this type of diabetes both naturally and progressively.

Gestational Diabetes Mellitus

Any glucose intolerance that develops or is initially identified during pregnancy is known as gestational diabetes mellitus (GDM) [8]. Preterm or eclampsia during pregnancy can result from high blood pressure in women with GDM. Type 2 diabetes and cardiovascular disorders are additional risks that these women may face later in life. According to Najafi et al. (2019) [9], babies born to women with gestational diabetes mellitus may also experience macrosomia, hypoglycemia, dyspnea, and type 2 diabetes in the future. The specific cause of GDM is yet unknown, but it is thought to be multifactorial. According to a recent comprehensive assessment of 30 meta-analyses, out of 61 risk variables, the most prevalent ones were obesity or overweight, diabetes in the family history, hypothyroidism,

breathing disorders during sleep, and polycystic ovarian syndrome.

Causes of Type I diabetes

The main cause of the illness is low insulin levels, which are usually caused by the immune system attacking and eliminating the beta cells in the pancreas that make insulin. This is essentially abnormal because normally the body is meant to defend against infections by identifying and eliminating bacteria, viruses, and other foreign substances that could be harmful to the body. However, the symptoms of the disease appear quickly, even though the destruction of these cells occurs over an extended period of time. Numerous gene interactions are thought to affect both susceptibility to and defense against Type 1 diabetes.

Causes of Type II Diabetes

Body Mass Index, or BMI Studies have indicated that a real risk factor for this condition is having an elevated body mass index [10]. These researchers showed that Type II diabetes and obesity been linked strongly in both men and women. It is especially crucial to bring up obesity in this discussion because obese persons have a higher risk of developing Type II diabetes and insulin resistance than non-obese people do. In addition, it's thought that hormones, non-esterified fatty acids, and high levels of glycerol generated by adipose tissues cause obesity [11]. A general decrease in insulin secretion is caused by beta cell malfunction in conjunction with insulin resistance. Thus, when the body becomes less able to regulate blood glucose levels, type II diabetes develops.

Prevalence of Diabetes Mellitus in Nigeria

Due to its high and increasing incidence of type 2 diabetes (T2DM), Nigeria is

frequently considered to have the biggest diabetes burden in Africa [12]. Africa's most populous nation is Nigeria. However, there are no acknowledged surveys carried out throughout the country, nor are there any published attempts to properly measure the prevalence of diabetes in Nigeria recently. Results from the 2002 national NCDs survey, which was mostly centered on the South-West, were inconclusive. Diabetes was found to be 2.2% prevalent in the national survey of non-communicable diseases (NCDs), which was conducted in 1997 [13].

Diabetes has been identified as the seventh most common cause of mortality worldwide, according to WHO (2016). At least 6.5 million instances of diabetes were documented in multiple studies conducted in South Africa; an equal number of cases remained undiagnosed. The Society of Endocrinology, Metabolism and Diabetes in South Africa (2003) reported that the prevalence of diabetes was high in the country and estimated to be 6% among Africans, 14% among the colored community, 6% among the European community, and 13% among the Indian community.

Diabetes testing in Primary Health Care (PHC) institutions is either rare or nonexistent, according to data from the World Health Organization (WHO). In 2021, there was, according to the World Health Organization (2022) [14], "no broad availability of diabetes testing (by blood glucose measurement, OGTT) at the primary healthcare level." Globally, the prevalence of diabetes rose by 74.41% in just 34 years. According to data from the World Health Organization (WHO), the number of people with diabetes increased from 108 million in 1980 to 422 million in 2014. In countries with lower and intermediate incomes, such as Nigeria, the

growth is more noticeable. Uduu (2023) [15] reports that 2 million people died from the illness in 2019—both directly and indirectly. There were 460,000 indirect deaths and 1.5 million direct deaths, according to the World Health Organization. The age range for diabetics who passed away is 18 to 70. Globally, the age-standardized diabetes death rate increased by 3% between 2000 and 2019. In low- and middle-income countries, the death toll increased by 13% [15].

There is not yet a comprehensive report on the prevalence of diabetes mellitus in Niger State.

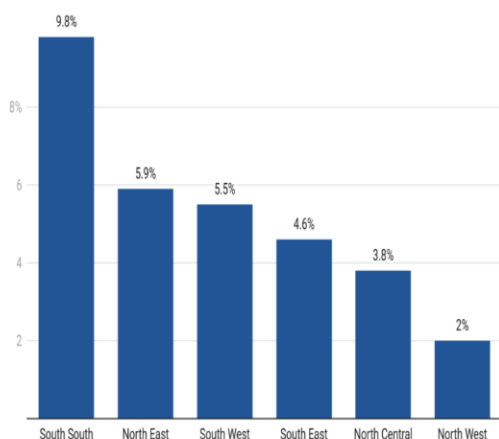


Figure 1: Prevalence of Diabetes in Nigeria in (%)

Source: (Uduu, 2023) [15]

Factors that predispose Nigerians to Diabetes

A poor diet is ranked as having an 8% prevalence risk among the seven factors that predispose persons to diabetes. Uloko et al. (2018) [16] report that the remaining factors are as follows: cigarette smoking (4.4%), physical inactivity (4.8%), urban residence (6.0%), obesity (5.3%), old age

(6.6%), and family history or genetics (4.6%). We can decrease our risk of type 2 diabetes by changing our lifestyle. Our inactive way of living puts us at risk for type 2 diabetes, he continued. Alcohol use is high among Nigerians, and we eat a lot of foods high in energy, such as cassava and yam.

Management of Diabetes Mellitus

It is possible to attain adequate glycemic control without using pharmaceutical medication. Mounting data indicates that nurses in rural Africa may effectively implement a straightforward treatment system centered on education and protocol, leading to good medium-term glycaemic reductions and patient satisfaction. Low-dose oral medications have been demonstrated in randomised controlled studies to decrease the frequency of relapse [17]. To meet the needs of patients in sub-Saharan Africa, particularly in rural communities, interdisciplinary support teams, diabetes educators, and specialists are required. A different option is to use an insulin pump (T1DM), which releases insulin into the body at regular intervals, with larger doses given right after meals. In addition, the patient should follow recommended dietary guidelines, such as eating high-fiber foods and low-fat to help lower their body's need for insulin; other guidelines include eating three meals a day and occasionally spacing out snacks during the day; in addition, it's important to monitor a regulated intake of fat and protein to prevent blood sugar swings.

Lack of consistent access to affordable diabetes medications, particularly insulin, is a significant problem for African individuals with the disease. This can result in underuse and preventable metabolic consequences [12].

Conclusion and Recommendation

Diabetes mellitus is a major health challenge both epidemiologically and economically. Understanding the prevalence is crucial because there is little data on the disease's prevalence in the country. Premature fatalities and early manifestation of diabetic complications are caused by late diabetes diagnosis combined with unequal access to main anti-diabetic medications, such as insulin, which the World Health Organization has considered essential for treating the condition.

Indeed, funding for agents like antihypertensive medications and generic glucose-lowering medications should be provided in the same manner as funding for HIV/AIDS medications, together with support for delivery systems, chronic illness education, and care models.

Authors Contribution

Halima carried out the research and wrote the original manuscript. Oyewole supervised the research and reviewed the manuscript

Disclosure of Conflict of Interest

None

Ethics Approval and Informed Consent

Not applicable

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