



Epidemiology of diabetes among people with infertility in Delta North, Delta State, Nigeria: Study proposal

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Abstract

Background: Diabetes is one of the leading causes of death worldwide with increasing prevalence. It is a health condition due to either defect in insulin secretion, action or both, leading to elevated blood glucose level. The word diabetes is from the Greek word diabetes which means '*Siphon*' to pass through; mellitus from the Latin word meaning sweet; sweet urine was discovered by Apollonius of Memphis. Infertility is one of the complications of DM. It is the failure to achieve pregnancy after 12 months of regular unprotected, sexual intercourse.

Objective: To determine the prevalence of diabetes mellitus among people with infertility issues in Delta north senatorial district, Delta state, Nigeria.

Context: Infertility may be due to male factors, female factors, combination of both or may be unexplained. It can be a sign for development of chronic disease associated with fertility decline. DM is among leading cause of mortality; long -term hyperglycemia causes much health complications in which infertility among male and female of reproductive age is one. About 85% of infertile cause is known, remaining 15% subfertile couples have unidentifiable cause, 25% of infertility diagnosis can be attributed to ovulatory disorder, 70% of women with anovulation have polycystic ovary syndrome. Globally 1 in 6 people have subfertility in their lifetime.

Conclusion: DM and infertility are health conditions that are both public health problems. The management is so demanding. It affects not only physical body but also emotional. Lifestyle modification and adequate management of hyperglycemia will enhance individual living a normal life without much complication, thereby reducing the prevalence of infertility. There is still need for further studies to further validate the findings of this study.

Key words: Diabetes, infertility.

Introduction

Diabetes mellitus is a public health problem affecting both men and women, young and old. The word diabetes is from the Greek word diabetes which means siphon, to pass through, from the Latin word mellitus meaning sweet, it was when sweet urine was discovered by Apollonius of Memphis (Sapra, 2023). It is one of the most common chronic diseases globally (Katsanou, 2026). Diabetes mellites is a chronic metabolic disease marked by persistent elevation of blood glucose level (Galicia-Garcia,2020). It is one of the health conditions due to either defect in insulin secretion and or insulin action or both (Jan, 2017). It is one of the leading causes of death worldwide, the incidence of diabetes is rapidly increasing (Cloete,2021). Risk factors in DM include genetic, behavioral lifestyle, environmental factors and obesity (Jan, 2017). Diabetes has mostly been seen in the situation where there is family history of diabetes; Sedentary life style constitutes a link with obesity and T2 DM due to reduced activity and high- caloric diet; can be prevented by improving the main modifiable risk factors (obesity, low physical activity and unhealthy diet) (Garcia, 2018).

Diabetes, which is characterized by elevated blood glucose manifest the following signs and symptoms- polyuria, polydipsia, feeling tired, dry lips, numbness on the hand or feet and can be diagnosed with fasting blood glucose of 126mg/dl (7.0 mmol/L) or higher (American Diabetes Association ,2020). Lifestyle change plays an important role in diabetes, which includes maintaining a healthy body weight, eating a healthy diet, staying physically active; unhealthy diet, sedentary lifestyle and genetic predisposition are currently important factors in global epidemic of DM (Zheng 2017). The classification of DM includes; Type 1 diabetes (due to auto immune B-cell destruction, usually leading to absolute insulin deficiency), Type 2 diabetes (non- auto immune progressive loss of adequate β cells insulin secretion due to insulin resistance), specific type of diabetes due to other causes e.g. monogenic diabetes syndrome, disease of the exocrine pancreases, drug induced diabetes and gestational diabetes mellitus (diagnosed in the second or third trimester of pregnancy) (American Diabetic Association ,2025)

Diabetes mellitus has high causes of morbidity and mortality and its complications include its effect on the nerves and blood vessels (Islam, 2025). Chronic hyperglycemia leads to the development of disabling and life-threatening health complications which include retinopathy,

neuropathy and nephropathy (microvascular), and cardiovascular diseases e.g. hypertension, coronary heart disease (macrovascular) (Goyal 2023). However, subfertility in both male and female are one of the complications of diabetes; diabetic patients have shown a higher risk of becoming infertile (Condorelli, 2018). Hyperglycemia affects the endocrine in the secretion of sex hormones including gonadotropin-releasing hormone, follicle stimulating hormone, luteinizing hormone and testosterone, causing hormonal dysfunction and can lead to testicular atrophy, stroma cell atrophy, seminiferous tubule damage, and spermatogenic cell damage; this can affect male fertility (He, 2021).

Infertility is the failure to achieve pregnancy after 12 months of regular unprotected sexual intercourse in women younger than 35 or after 6 months in women older than 35 (Adebisi, 2026). About 85% of infertile couples have identifiable cause, the remaining 15% of subfertile couples have undefinable cause (Carson, 2021). Studies revealed that 25% of infertility diagnosis can be attributed to ovulatory disorders, 70% of women with anovulation have polycystic ovary syndrome, infertility can also be a sign for development of chronic disease associated with fertility decline (Carson, 2021). Infertility may be due to male factors, female factors, combination of male and female factors or may be an unexplained factor (WHO, 2023).

Statement of Problem

Diabetes mellitus is a public health problem with high morbidity and mortality. It has been characterized with hyperglycemia; long-term hyperglycemia causes much complication in which infertility in male and female of reproductive age is among; diabetes is among the leading cause of mortality worldwide; it is 7th leading cause of death in US (Sapra 2023). DM is among the chronic disease that is common today because of its prevalence. It reduces life expectancy if not controlled (its treatment demands self-control, discipline and adherence). Its complications include decline in fertility in both man and woman (He, 2021).

Infertility is a significant problem affecting many couples seeking to start or to expand their family. It is a global health issue affecting millions of people of reproductive age worldwide; globally 1 in 6 people are having subfertility in their lifetime (WHO 2023). It is a medical condition which can cause emotional, physical mental effects on the affected and approximately 15% of couples worldwide experience infertility (Adebisi 2026).

Aim

The main objective of this study is to determine the prevalence and determinants of diabetes mellitus among people with infertility issues in Delta North, Delta State, Nigeria

Objectives

1. To determine the prevalence of diabetes mellitus among those with infertility issues attending fertility clinics.
2. To identify determinants of infertility among couples attending fertility clinics in Delta North area, Delta state.
3. To determine the correlation between diabetes mellitus and determinants of infertility among the study participants
4. To determine the socio-demographic variables among those with infertility issues.

Research Question

1. What is the prevalence of diabetes mellitus among those with infertility issues attending fertility clinics?
2. What are the determinants of infertility among couples attending fertility clinics in Delta North area, Delta state?
3. Is there any correlation between diabetes mellitus and determinants of infertility among the study participants?
4. What are the socio-demographic variables among those with infertility issues?

Research Hypotheses

Null hypotheses (H_0)

1. There is low prevalence of diabetes mellitus among those with infertility issues attending fertility clinics.
2. There is no correlation between diabetes mellitus and determinants of infertility among the study participants.

Alternative hypotheses (H_1)

1. There is high prevalence of diabetes mellitus among those with infertility issues attending fertility clinics.

2. There is a correlation between diabetes mellitus and determinants of infertility among the study participants.

Significance of Study

The findings of this study will be of great benefit to the ministry of health, health workers, and those with infertility issues by increasing awareness of the possible coexistence of diabetes mellitus and infertility. The study will contribute to increased sensitization about diabetes mellitus, its determinants and complications through campaign and screening to enhance early detection and control. The knowledge may assist healthcare providers in identifying patients that are at risk of diabetes based on the determinant factors. The result will enable policy makers in all arms of government to organize workshops, seminars and conferences for health workers and communities on the prevalence of diabetes and infertility. Hence, creating awareness of the disease thereby reducing its prevalence and burden.

Scope of study

The study population includes individuals of reproductive age (18 - 49 yrs) experiencing infertility, encompassing both males and females.

The research will be carried out in Delta North Senatorial District, Delta state. A cross-sectional approach will be employed, collecting data from patients attending fertility and gynecology clinics with the use of well-structured questionnaires.

Variable to assess includes primary variable- presence of DM and infertility status.

Secondary variables include, age, gender, socioeconomic factor, BMI, lifestyle factors e.g. Sedentary, duration of infertility.

Limitation of study:

Individuals seeking medical attention may not represent broader population of individuals with infertility, potentially distorting prevalence estimates. Reliance on self-reported data for certain variables e.g. Lifestyle factors may introduce reporting bias. Being self-funded research, the geographical reach and sample size are limited by funding.

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