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Prevalence and Risk Factors Associated with Diabetes Mellitus in Public Secondary Schools Teachers in Ekiti State

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Abstract

Background: Diabetes Mellitus is a non-communicable disease and a leading cause of morbidity and mortality in the world. The estimated prevalence of diabetes in Africa is 1% in rural areas and ranges from 5% to 7% in urban sub-Saharan Africa. 3 Nigeria is the most populous country in African and she contributes about one sixth of the Africa's diabetic population. This study is aimed at determining the prevalence of diabetes mellitus and accessing its risk factors among public secondary school teachers in Ekiti State.
Methodology: This survey is a cross-sectional study carried out among 357 public school teachers in Ekiti State using a multi stage sampling technique. Data was gathered using a semi structured questionnaire and Accu Check Glucometer machine for Fasting Blood Sugar. Analysis was done using SPSS version 23 and level of significance was taken as P = 0.05.
Result: Mean age was 42.9±9.2 years. Prevalence of Diabetes Mellitus was 5.6%. Family history (15%), Alcohol intake (14.0%) and smoking (11.2%) were major risk factors in the respondents. Poor vision is the main complication being experienced by the respondents (40.3%). Predictors of Diabetes Mellitus as found by this study include increasing age (starting from above 40years), cigarette smoking, alcohol intake and positive family history.
Conclusion: Prevalence of Diabetes Mellitus is high compared to what it was before. Alcohol intake, smoking and family history were major risk factors while poor vision is the commonest complication. It is recommended that all efforts must be made to put in mechanism that will halt this undesired progression through control of risk factors.

Key words: Prevalence, Diabetes Mellitus, Teachers, Ekiti State

Introduction

Diabetes Mellitus is a non-communicable disease and a leading cause of morbidity and mortality in the world.[1,2] Diabetes Mellitus is a hyperglycemic state with problem in the metabolism of glucose, fats and protein due to defect in insulin (insulin resistance due to antagonist) or non-production of insulin in β cells of pancreas. Diabetes is an iceberg disease as more than half of those affected are unaware until they are diagnosed on screening or present with one or more of the disease complications.[3,4,5,6]
Before now, Diabetes used to be a burden of the developed world being a disease of the affluence. But with epidemiologic, demographic and nutritional transition, the disease has shown tremendous increase in prevalence in recent years with populations previously unaffected or minimally affected by Diabetes Mellitus (the developing world) now witnessing increased burden of the disease.[2] This poses real challenges to healthcare financing by governments and non-

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governmental organizations.[2]

Diabetes Mellitus is of three major types. Type 1 DM which is due to auto-immune β cells destruction leading to development of insulin deficiency and this type is more common in younger aged diabetic patients. Type 2 DM is due to heterogenous group of disorders characterized by variable degree of insulin resistance (due to antagonists), impaired insulin secretion and increased glucose production. Gestational DM is a type of DM with hyperglycemia in pregnant women not diabetic prior to conception (usually start at 13th week of gestation) and may disappear after delivery. [5,6]

There are numerous risk factors for diabetes mellitus which can be classified into non-modifiable and modifiable factors. The non-modifiable factors are age, sex, race/ethnicity and genetic predisposition while modifiable factors include obesity, excessive alcohol intake, smoking, diets, sedentary lifestyle, hypertension, pregnancy, hypercholesterolaemia, infections and polycystic ovarian syndrome.[4,5,6] Diabetes Mellitus is a known risk factor for blindness, vascular brain diseases, renal failure, lower limb gangrene and death from acute diabetes emergencies.[1]

In 2017, it was estimated that 425million people (20-79years of age) suffered from Diabetes Mellitus and it is expected that this will increase to about 592million people and 629million people by year 2035 and 2045 respectively.[1] According to International Diabetes Federation (IDF) Atlas guideline report, currently, there are 352million adults with impaired glucose tolerance who at high risk of developing diabetes in future.[1,7]

The estimated prevalence of diabetes in Africa is 1% in rural areas and ranges from 5% to 7% in urban sub-Saharan Africa.[3] Nigeria is the most populous country in African and she contributes about one sixth of the Africa's diabetic population.[3]

This study which is aimed at determining the prevalence of diabetes mellitus and assessing its risk factors among public secondary school teachers in Ekiti State will help in putting in strategies for prevention, earlier detection and management.

Methodology

This survey is a cross-sectional study carried out among 357 public school teachers in Ekiti State. Ekiti State is one of the thirty-six states in Nigeria and is located in the south-western part of the country. The State was carved out of the old Ondo State in October, 1996 with the headquarters located in Ado-Ekiti. It has three senatorial districts (Ekiti Central, Ekiti South and Ekiti North senatorial districts. Ekiti Central and Ekiti North) divided into sixteen (16) Local Government Areas (LGAs). Ekiti State has an estimated total population of 2,384,212 (National Population Commission figures of 2006) with a 2021 projection of 3,816,784 based on an annual growth rate of 3.2%[8].

A multistage sampling technique was used in selection of respondents. At stage one, 2 LGA were randomly selected by balloting from each of the senatorial district making 6 LGA. At stage two, 5 public secondary schools were randomly selected by balloting from each of the LGA making a total of 30 public secondary schools. At the last stage questionnaires were proportionally allocated to each school and respondents were selected using systematic sampling technique.

Data was collected between May and July, 2019 using a semi structured questionnaire and Accu Check Glucometer machine was used for Fasting Blood Sugar recordings (done immediately after assembly after being told to come to school fasting the day following questionnaire administration). Data was sorted, coded and analyzed using IBM SPSS version 23. Frequency, percentages, mean and standard deviation were presented in tables at univariate level of analysis. Chi square and t test were used to assess the association between dependent and independent variables at bivariate and multivariate levels of analysis respectively. P-value <0.05 was taken as significant.

Ethical approval was obtained from Health Research and Ethic Committee of Federal Teaching Hospital, Ido-Ekiti, Ekiti State, Nigeria. Participation was anonymous and voluntary. Informed consent was taken by ticking a yes/no question.

Results

Socio-demographic Characteristics of Respondents

A total of 357 secondary school teachers participated in the study. The mean age of the respondents was 42.9±9.2. Majorities were females

Table 1: Socio-demographic characteristics of Public Secondary School Teachers in Ekiti State

Variable		Frequency N = 357	Percentage (%)
Age Group (in years)			
	Below 30	6	1.7
	30 - 39	94	26.3
	40 – 49	127	35.6
	50 – 59	104	29.1
	60 and above	26	7.3
Mean Age ± SD	42.9 ± 9.2		
Sex			
	Male	136	38.1
	Female	221	61.9
Marital Status			
	Single	27	7.6
	Married	322	90.2
	Divorced/Separated	7	1.9
	Widowed	1	0.3
Tribe			
	Yoruba	312	87.4
	Igbo	32	8.9
	Hausa	2	0.6
	Others	11	3.1
Family type			
	Monogamy	331	92.7
	Polygamy	26	7.3
Educational Qualification			
	NCE	3	0.8
	University Degree	303	84.9
	Postgraduate Degree	51	14.3

Table 2: Prevalence of Diabetes Mellitus among Public Secondary School Teachers in Ekiti State

Variable		Frequency N = 357	Percentage (%)
Fasting Blood Sugar			
	Diabetic	20	5.6
	Non-diabetic	337	94.4

Table 3: Presence of Risk Factors for Diabetes Mellitus among Public Secondary School Teachers in Ekiti State

Variable		Frequency N = 357	Percentage (%)
History of ever Smoked cigarette		40	11.2
History of currently Smoking cigarette		3	0.8
History of ever taken alcohol		50	14.0
History of physical Activities			
	Light	188	52.7
	Moderate	107	30.0
	Active	52	14.6
History of Fruits and Vegetable Consumption			
	Once in a while	74	20.7
	Often	266	74.6
	Always	17	4.7
Family history of Diabetes			
	Yes	55	15.4
	No	302	84.6

Table 4: History of Complication of Diabetes Mellitus among Public Secondary School Teachers in Ekiti State

Variable	Frequency N = 357	Percentage (%)
Poor Vision	144	40.3
Heart Attack	3	0.8
Kidney Disease	2	0.6
Stroke	0	0.0
Limb Amputation	0	0.0

(61.9%) and married (90.2%). Type of marriage was majorly monogamy (92.7%) and Yorubas were 87.4%. Majority were university graduates (84.9%).

Prevalence of Diabetes Mellitus among Public Secondary School Teachers in Ekiti State

5.6% of the respondents were diagnosed to have diabetes using a Fasting Plasma Glucose cut-off value of 126mg/dl (7mmol/L) on Accu Check Glucometer machine.

Presence of Risk Factors for Diabetes Mellitus among Public Secondary School Teachers in Ekiti State

11.2% of the respondents have history of ever smoked before while only 0.8% were currently smoking at the time of the study. Also 14% of the respondents have history of alcohol intake. Almost all the respondents engage in physical activities but majority (52.7%) engages in only light exercise. Majority of the respondents (almost 75% often take fruits and vegetables; between 2-5times in a week).

Binary Logistic Regression for the Predictors of Diabetes Mellitus among Public Secondary School Teachers in Ekiti State

Variable	AOR	95% CI for AOR		p-value
		LB	UB	
Age Group (in years)				
Below 30	1.000			
30 – 39	1.875	0.458	4.114	0.266
40 – 49	3.529	1.087	11.460	**0.036**
50 – 59	4.825	1.206	19.312	**0.026**
60 and above	9.749	2.216	28.600	**<0.001**
Gender				
Male	1.309	0.672	5.599	0.345
Female (ref)	1.000			
Educational Qualification				
NCE	4.203	0.133	13.054	0.068
University Degree	3.080	0.791	6.693	0.415
Postgraduate Degree (ref)	1.000			
Cigarette smoking				
Yes	2.342	1.079	6.870	**0.039**
No (ref)	1.000			
Alcohol intake				
Yes	3.144	1.149	7.652	**0.021**
No (ref)	1.000			
Family history of DM				
Yes	5.632	1.881	16.862	**0.002**
No (ref)	1.000			
Fruit and Vegetable consumption				
Yes (ref)	1.000			
No	2.048	0.412	5.263	0.322

About 15% of the respondents gave a family history of Diabetes Mellitus.

History of Complication of Diabetes Mellitus among Public Secondary School Teachers in Ekiti State

A significant number of the respondents (40.3%) have history of poor vision but it could not be ascertained if this is due to diabetes. Less than 1% has suffered heart attack in the past and about 0.6% was having kidney related diseases.

Predictors of Diabetes Mellitus

The likelihood of having Diabetes Mellitus increases from the age of 40 and above. Age 40-49years are 3.5 times more likely to have Diabetes Mellitus than below 30years of age while age 60years and above are close to 10times more likely to develop Diabetes than less than 30 years. Also, those who smoke cigarette are 2.3 times more likely to develop Diabetes than those who do not smoke. Those who drink alcohol are 3 times more likely to develop Diabetes Mellitus than those who do not. Those with family history of diabetes are 5.6times

more likely to develop the disease than those without the family history.

Discussion

The prevalence of Diabetes in this study is 5.6%. This finding is far higher than 1.7% as reported by International Diabetes Federation (IDF) Atlas guideline but in keeping with a systemic review done in Nigeria[2] where the pooled prevalence of Diabetes Mellitus was found to be 5.77%. This research work finding is also close to the finding in a study on diabetes Mellitus in Nigeria where the overall prevalence of DM in Nigeria was documented as 4.2%.[3] The finding is also similar to the report given by a study on prevalence and risk factors of Diabetes Mellitus in Ethiopia where a prevalence rate of 6.5% of diabetics was reported.[1]

This study found out that increasing age, smoking, alcohol intake and family history are major risk factors and predictors for diabetes mellitus among respondents. This is similar to findings in an Ethiopian study on prevalence and risk factors of Diabetes Mellitus where alcohol intake and smoking were found to be the major risk factors for diabetes mellitus among respondents.[1] The age component of the predictors is also similar to findings among people living with HIV/AIDS where it was found that age and male gender is a predictor of Diabetes Mellitus and also in a study to determine the prevalence and predictor of pre-diabetes and diabetes among adult 18years or older in Florida where age, male gender and lower income was reported as risk factors of Diabetes.[9,10] Also, the finding of this study is similar in terms of age and parental/family history recorded in the Framingham Offspring study on prediction of incident diabetes mellitus in middle-aged adults and in the study on predicting the risk of type 2 Diabetes by using data on Easy-to-measure risk factors.[11,12]

Conclusion

Prevalence of Diabetes Mellitus is becoming increasingly high in Nigeria compared to what it was in 1992 (2.2%) when the last national health survey was done. The common risk factors for diabetes among Nigerians still remain increasing age, alcohol intake, smoking and positive family history while the commonest complication was poor vision Therefore, all efforts must be made to put in mechanism that will halt this undesired progression.

Competing Interest

The authors declare no competing or conflict of interest

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Nil

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