Clinical Correlates of Type 2 Diabetic Patients with Erectile Dysfunction Attending the Family Medicine Clinic in a Southern State of Nigeria

ABSTRACT

Aims: This study aimed to provide evidence on the clinical correlates of type 2 diabetic patients with erectile dysfunction leading to improved quality of life.

Study Design: Cross-sectional study.

Place and duration of study: Family Medicine Clinic of Braithwaite Memorial Specialist Hospital (BMSH) [now Rivers University Teaching Hospital] Port Harcourt. The data was collected from January 2012 to April 2012.

Methodology: This hospital-based study was conducted on 324 male type 2 diabetic patients using systematic random sampling. The data were collected with a structured questionnaire; and the level of erectile dysfunction was measured using the international index of erectile function. Data was entered and analyzed using SPSS version 16. Logistic regression was employed to test associations between independent and outcome variables.

Results: Three hundred and twenty-four patients enrolled for the study. Only 31 participants (9.5%) had normal erectile function while 273 (90.5%) had varying degree of erectile dysfunction. Majority of the participants 205(63.2%) had diabetes above 20 years, more than half (64.9%) had poor glucose control, 169(52.1%) were overweight, while 284(87.6%) had normal cholesterol level and 186(57.4%) with elevated diastolic blood pressure. Duration of diabetes and diastolic hypertension were the only factors associated with erectile dysfunction $p<0.0001$ and $p<0.004$ respectively.

Conclusion: This study confirmed a high prevalence of ED in type 2 diabetic male patients especially among those with elevated blood pressure and those living with diabetes mellitus for many years.

Keywords: Diabetes mellitus; Erectile dysfunction; clinical correlates

INTRODUCTION:

The increasing prevalence of diabetic mellitus have been linked to certain risk factors such as sedentary lifestyle and a population that is aging [1], which has resulted in an increase in the numerous complications that have been classified as neurologic or vascular and ED has been documented in both classes [2].

"World Health Organization (WHO) defines erectile dysfunction (ED) as the continuous or repetitive inability to achieve or maintain an erection sufficient for a satisfactory sexual activity" [3]. "This term is also applied for those who experience erectile inability during attempted intercourse, on more than 75% occasions and not the episodic or isolated sexual failures which most men sometimes face during their lifespan" [4].

"The frequent existence of erectile dysfunction (ED) in diabetic males notwithstanding, it has remained one of the most neglected complications of diabetes" [5]. This neglect by primary care physician has led to untoward consequences in the wellbeing of diabetics. There is a dearth of studies on diabetic patients with erectile dysfunction in Nigeria especially its South-South region. This study aimed to provide evidence on the clinical correlates of diabetic patients with erectile dysfunction leading to improved quality of life

MATERIALS AND METHODS

Study Design and Population: This Hospital based cross sectional study was conducted in the Family Medicine clinic of the Braithwaite Memorial Specialist Hospital (BMSH) [now Rivers State University Teaching Hospital], Port Harcourt. Port Harcourt is the capital of Rivers State, South-South of Nigeria. The data was collected from January 2012 to April 2012. Adult male patients age ≥ 18 years with a diagnosis of type 2 DM were enrolled in the study. Study participants who were too ill, or had known secondary ED from neurological, surgical, genetic, or other endocrine causes or individuals with ED before the diagnosis of diabetes and those not engaging in any form of sexual activity at the time of the interview were excluded from the study.

Sample Size Determination: The sample size was calculated using the single population proportion formula, a total of 324 eligible patients were recruited for this study using systematic random sampling method. The first patient having been randomly recruited.

Study Instruments and Measurements: The data was collected using a pre- tested, pre coded interviewer administered structured questionnaire. The questionnaire comprised of socio-demographic variables, and international index of erectile function - 5 (IIEF-5) [6]. Clinical characteristics measured were Body Mass Index (BMI), the status of glycemic control, and duration of DM, stage of hypertension, total cholesterol, smoking status, alcohol intake and physical exercise.

Assessment of Erectile Function: "Erectile dysfunction was assessed using the abridged version of the International Index of Erectile Function - 5 (IIEF-5)" [6]. This multidimensional instrument assesses five features of sexual function such as erectile function, orgasmic function, sexual desire, satisfaction after intercourse and overall satisfaction. Each domain was assessed by a five-point Likert scale and the scores ranged from 0 to 25. Scores 1–7, 8–11 and 12–21 out of 25 points were classified as severe ED, moderate ED and mild ED, respectively; while score of more than 21 was considered as having a normal erectile function.

Measurement of clinical characteristics: The respondents arrived at the Family medicine clinic in overnight fasting state to enable the Researchers measured fasting blood glucose and total cholesterol using a glucometer and calorimeter respectively. Fasting blood glucose reading of <7mmol/L was considered as controlled blood glucose, while fasting total cholesterol level of <5.17mmol/L was considered normal. Body mass index (BMI) was calculated as weight (in kilograms) divided by the standing height (in meters squared) and classified using the World Health Organization criteria. To obtain the blood pressure value the average of two Blood pressure readings was obtained using the manual sphygmomanometer. Individuals who smoked any number of cigarette(s) were labeled as "smokers", also those individuals who drank any level of alcohol were labeled as "Drinkers" while those who did not engage in any form of physical exercise were classified as not physically active.

Statistical Analysis: Data cleaning and assumption checking were performed prior to proceeding for analysis. The data was entered into and analyzed using SPSS version 16. Descriptive statistical analysis like frequency and percentage for the categorical variables and mean was used. Logistic regression analysis was employed to determine whether independent factors predict erectile dysfunction. The result of the odd ratio (OR) was used for interpretation of strength of prediction of the independent variables to the outcome. For all statistical significance tests, the cut-off value set was $p \leq 0.05$ with confidence interval of 95%.

RESULTS: Three hundred and twenty –four respondents (324) were interviewed and the overall mean erectile dysfunction was 15.23 ± 7.07. Only 31 participants (9.5%) had normal erectile function while 273 (90.5%) had varying

degree of erectile dysfunction. Mild, mild-to moderate, moderate, and severe erectile dysfunction was found in 83 (25.5%), 89 (27.5%), 73 (22.5%), and 48 (15.0%) participants, respectively (see Table 1)

Table 1: **Erectile function scores of the study population**.

	Assessment of erection	Frequency (%)
Erectile dysfunction	Normal erectile function (IIEF-5 score > 21)	31(9.5)
	Mild ED (IIEF-5 score 17–21)	83(25.5)
	Mild-to-moderate ED (IIEF-5 score 12–16)	89(27.5)
	Moderate ED (IIEF-5 score 8–11)	73(22.5)
	Severe ED (IIEF-5 score < 8)	48(15.0)
	TOTAL	324(100)

C**linical and Lifestyle characteristics of the study participants (n=324)**

Majority of the participants 205(63.2%) had diabetes above 20 years, more than half (64.9%) had poor glucose control, 169(52.1%) were overweight, while 284(87.6%) had normal cholesterol level. 186(57.4%) with elevated diastolic blood pressure were in majority, participants who did not smoke, drink alcohol nor engaged in physical activities made up majority of the participants 290(89.5%), 249(76.9%), 173(53.4%) respectively.

Table 2: C**linical and Lifestyle characteristics of the study participants**

Variable	Frequency (%)
Duration of Diabetes	
<10 years	25(7.7)
10-19 years	94(29.0)
>20 years	205(63.2)
Glycaemic Control	
< 7mmol/l	114 (35.1)
≥ 7mmol/l	210 (64.9)

BMI	
Underweight	8(2.4)
Normal	104(32.0)
Overweight	169(52.1)
Obesity	43(13.2)
Total Cholesterol	
<5.17mmol/l	284(87.6)
≥5.17mmol/l	40(12.3)
Systolic blood pressure	
<140mm/Hg	163(50.3)
≥140mm/Hg	161(49.7)
Diastolic blood pressure	
<90mmol/Hg	138(42.5)
≥90mmol/Hg	186(57.4)
Smoking	
No	290(89.5)
Yes	34(10.5)
Alcohol consumption	
None	249(76.9)
Yes	75(23.1)
Physical activity	
Never	173(53.4)
Yes	151(46.4)

Independent Predictors of Erectile Dysfunction

A logistic regression analysis was conducted to predict the occurrence of ED using duration of DM, FBG control, BMI, Total cholesterol level, systolic and diastolic blood pressure, smoking, alcohol consumption, and physical exercise as

category variables. Duration of diabetes and diastolic hypertension were the only factors associated with erectile dysfunction p<0.0001 and p<0.004 respectively. (Table 3)

Table 3: Independent Predictors of Erectile Dysfunction

Variable	Erectile dysfunction				
Duration of Diabetes(years)	Yes	No	OR	CI	P
<10	4	21	1		
10 – 19	84	10	44	12.5 – 154,5	< 0.0001
>20	205	0	1963	102.2 – 377720.0	< 0.0001
Glycaemic control (mmol/L)					
< 7 mmol/l	101	13	1		
≥ 7mmol/l	192	18	1.3	0.6- 2.9	0.49
Body Mass Index (BMI)					
<25	98	14	1		
> 25	195	17	1.6	0.7 – 3.4	0.19
Total Cholesterol (mmol/L)					
< 5.17	257	27	1		
≥ 5.17	36	4	0.9	0.3 – 2.8	0.9
Systolic blood pressure (mmHg)					
<140	148	15	1		
≥ 140	145	16	0.9	0.4 – 1.9	0.8
Diastolic blood pressure(mmHg)					
< 90	117	21			
≥ 90	176	10	3.1	1.4 – 6.9	0.004
Smoking					
No	256	31	8.3	0.5 – 139.9	0.139

Yes	34	0			
Alcohol Consumption					
None	223	26			
Yes	70	5	1.6	0.6 – 4.4	0.33
Physical activity					
Never	161	12			
Yes	132	19	0.5	0.2 – 1,1	0.08

DISCUSSION: This study confirms a high prevalence of ED among the diabetic patients (90%), this is comparable to high prevalent rates of 81% and 95% found in two cross sectional studies carried out in Ilorin [7] and South Africa [8] but higher than the prevalence rate of 38.9% and 64.6% obtained in India [9] and Japan [10] respectively. This high prevalence rate obtained in this study may be as a result of late presentation of diabetic patients with its attendant complications to the hospital. Studies conducted in Europe and other developed countries are likely to report low prevalence figures, due to the fact that in developed countries, DM may be detected early and blood glucose may be well controlled and therefore the chronic complications are prevented. The difference in the age range of the recruited participants in the various studies and criteria for the definition of ED could also account for the observed variation in the prevalence rate.

As documented in several other studies [11,12,13], “DM duration was found to be an independent risk factor for ED in our study population. It was observed that those who were living with DM for greater than ten years were forty-four times more likely to experience erectile dysfunction as compared with those who were living with it for less than ten years (COR: 44; 95%CI: [12.5 154.5]; p< 0.0001). This could be attributed to the fact that there is worsening neuropathy, endothelial dysfunction, angiopathy with longer duration of the disease” [14.15].

Good glycaemic control is vital in the prevention of microvascular and neuropathic complications of ED [16], this study however failed to show any association between glycaemic control and erectile dysfunction (p=0.40), this is similar to results obtained in some studies [14,17,18] but in contrast to results obtained in other studies [11,16,19]. The difference in

the findings could be attributed to the fact that whereas fasting blood glucose was used in assessing glucose control in this study HBA1c was utilized in the contrasting studies.

Although overweight/obesity has been found in some studies [16,20,21], to be a significant predictor of erectile dysfunction, this study however did not find any association (p=0.19) which is in consonance with some other studies [14,17,22]. This study failed to show an association between total cholesterol (p=0.9), smoking (p=0.13), alcohol consumption (p=0.33), physical activities (0.08) and erectile dysfunction similar to findings in some studies [14,17,22] but contrasting other studies [20,23].

A number of mechanisms have been identified in the pathogenesis of erectile dysfunction among hypertensive men. The Severity of hypertension might result in reduced nitric oxide production negatively affecting erectile function [24,25]. Hypertension had a significant relationship with ED in this study which is in consonance with other the findings of other workers [18,24] but in contrast to the finding of another study [16].

LIMITATIONS OF THE STUDY: This study was cross sectional in design; hence causality cannot be established, and further study to examine causality should be done. Respondents with long standing diabetes mellitus may be unable to recall some factual details such as duration of diabetes mellitus. The presence of ED was based on respondents' self-report, without any attempt to clinically confirm the diagnosis, hence it is subjective and may have bias

CONCLUSION: The finding of this study indicates a high prevalence of erectile dysfunction among male DM patients with most respondents having mild and moderate erectile dysfunction. Diastolic hypertension and living with DM for more than 10 years was significant predictor of ED. As a result of social stigmatization many ED respondents suffer in silence and do not readily relay their concerns to their physicians. Physicians, especially primary care ones, therefore, need to pay greater emphasis to the sexual history of their patients for early detection and management of ED.

Ethical Approval and Consent : The study was approved by Ethical Clearance Committee of BMSH. Prior to the data collection, respondents were briefed on the aim of the study and written informed consent was obtained from each respondent. Their participation was voluntary and they were informed about their right to withdraw from the study at any point and they were not obliged to respond to any question they find discomforting. During the data collection, confidentiality was ensured with the use of anonymous questionnaires. Moreover, to maintain privacy, patients were interviewed alone.

CONFLICT OF INTEREST: None

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