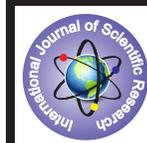Original Research Paper

Influence of Knowledge and Dietary Compliance on the Glycemic Control and Nutritional Status of Diabetes Mellitus Patients in Ibadan, Nigeria: A Hospital Based Study

Medical Science

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ABSTRACT

The study was carried out to determine the influence of knowledge and dietary compliance on the glycemic control and nutritional status of 50 patients with type 2 diabetes mellitus in O.L.A Catholic Hospital Ibadan, Nigeria.
Methods: A semi-structured interviewer administered questionnaire was used to obtain information on the socio-demographic characteristics, knowledge about diabetes mellitus and dietary compliance of the respondents and anthropometric status of the respondents. Data collected were analyzed using descriptive and inferential statistical tools.
Results: Most of the respondents, 38 (76.0%) and 29 (58.0%) had poor overall knowledge score (<50 % score) and dietary compliance (<50% score) respectively. Respondents' knowledge and dietary compliance had significant influence on their biochemical status and anthropometric status (p < 0.05).
Conclusion: Nutrition education to diabetic mellitus patients regarding diet, as well as patient compliance needs to be improved.

Introduction

Type 2 diabetes poses a major global health threat and is increasingly common in Asian and African countries[1] where most patients will probably be found by 2030, following the trend of urbanization and lifestyle changes. International Diabetes Federation Africa reported that there were more than 1.56 million cases of diabetes in Nigeria in 2015 and the figure will be more than double by 2040[2].

Dietary management is an essential component of diabetes care and management and requires lifestyle changes and adequate diabetes knowledge[3]. Knowledge about diabetes mellitus can also increase early detection and reduce the incidence of complications thus educating the patient is essential for preventing complications[4].

Dietary compliance is a major factor in achieving glycemic control in type 2 diabetes mellitus patients[5]. However, a few studies have shown poor compliance to dietary recommendations by diabetic patients[5,6].

WHO[7] reported that the rate of non compliance in patients with chronic diseases in developed countries on long term treatment is on the order of 50% and this could be higher in developing countries like Nigeria.

In Nigeria, there is little information on the influence of knowledge and dietary compliance on the glycemic control and nutritional status of the patients. Hence, the purpose of this study.

Methodolgy.

This was a cross sectional study conducted at Our Lady of Apostle (O.L.A) Catholic Hospital Oluyoro, Ibadan, Nigeria. The inclusion criteria included outpatients diagnosed of type 2 diabetes mellitus patients attending O.L.A Catholic Hospital for a period of 2 month, who has undergone dietary counseling at least once with the dietitian and who gave their consent to participate. Ethical approval was obtained from the hospital's committee and University of Ibadan/University College Hospital Ethical Review Board.

The knowledge of the patients on diabetes mellitus was assessed based on the adapted and modified version of the Michigan Diabetes Research and Training Centre's Brief Di-

abetes Knowledge Test[8,9]. It consisted of 17 multiple choice questions; the first 14 questions assessed general diabetes mellitus knowledge and the last 9 questions assessed insulin knowledge.

The diet sheets that is being used by the dietitians for counseling were developed into a questionnaire to measure dietary compliance. The questionnaire consisted of 18 multiple choice questions. Anthropometric data such as height, weight, body fat percentage, visceral was obtained using a Stadiometer and Omron body composition monitor. The fasting blood glucose value was obtained using Accu check blood glucose monitor.

Respondents' knowledge and compliance below 50% were categorized as poor while knowledge and compliance score of 50% and above were categorized as good. The level of statistical significance was assumed throughout to be 0.05.

RESULTS

Table 1: Summary of Respondents' Knowledge on Diabetes Mellitus and their compliance to dietary management

Diabetes Knowledge Score (%)	n (%)	*p* Value
Poor (<50%)	38(76.0)	0.00
Good (≥50%)	12(24.0)	
Mean±S.D. Score (%)	37.88±15.04	
Dietary Compliance (%)		
Poor (< 50%)	29(58.0)	0.00
Good (≥ 50%)	21(42.0)	
Mean±S.D Score (%)	45.27 ± 13.15	

t-test at 5% level of significance

Table 2: Fasting Blood glucose and Anthropometric Status of the Respondents

	Male n(%)	Female n(%)	Total N(%)	p-value
Fasting blood glucose (mg/dl)				
Below 65	1(4.3)	0(0.0)	1(2.0)	0.77

Normal (65 - 110)	9(39.1)	10(37.0)	19(38.0)	
IGT (111 - 126)	3(13.0)	4(48.1)	7(14.0)	
DM (> 126)	10(43.5)	13(48.1)	23(46.0)	
Mean±SD	149±85.5	144.0±56.4	146.68±70.53	
Body Mass Index (kg/m²)				
Underweight (< 18.5)	3(13.0)	0(0.0)	3(6.0)	0.06
Normal Weight (18.5 - 24.9)	6(26.1)	10(37.0)	16(32.0)	
Overweight (25.0 - 29.9)	9(39.1)	6(22.2)	15(30.0)	
Obese (≥ 30.0)	5(21.7)	11(40.7)	16(32.0)	
Mean±S.D.	25.56±5.80	29.00±6.47	27.41±6.35	
Visceral Fat				
Normal (1 - 9)	9(39.1)	13(48.1)	22(44.0)	0.58
High (10 - 14)	5(21.7)	9(33.3)	14(28.0)	
Very High (15 - 30)	9(39.1)	5(18.5)	14(28.0)	
Mean±S.D.	11.48±5.9	10.67±4.3	11.04 ± 5.05	

Body Fat Percentage (%)	Male	Reference	Female	Reference	
Mean Age (years)	64.0	60-80	59	40-59	0.00
Mean Body Fat Percentage %	24.67	13.0-24.9	38.94	34.0-39.9	
Mean±S.D.	24.67 ± 7.10		38.94 ± 9.97		

t-test at 5% level of significance

Table 3: Correlation of Respondents' Diabetes Knowledge and Compliance with Fasting Blood Glucose and Anthropometric Status

	Diabetes Knowledge Score			Dietary Compliance Score		
	R	t	*p Value*	R	t	*p Value*
Fasting Blood Glucose (mg/dl)	-0.315	-10.042*	0.000	-0.460	-9.258*	0.000
Anthropometric Status						
Body Mass Index (kg/m²)	0.049	4.615*	0.000	0.131	9.130*	0.000
Body Fat Percentage (%)	-0.130	1.953	0.056	-0.153	4.908*	0.000
Visceral Fat	0.136	12.486*	0.000	0.103	17.813*	0.000

R Correlation coefficient, * *t* -test is significant at 0.05 level ($p < 0.05$)

DISCUSSION

This study found out that majority of the respondents were overweight and obese. According to WHO[10], the risk of Type 2 Diabetes Mellitus increases continuously with BMI and decreases with weight loss. Similar to Kamna et al[11], BMI of the respondents in this study revealed that higher number of female respondents (40.7%) were obese compared to their male counterpart (21.7%). The body fat percentage of the male respondents (24.67%) was normal while that of their female counterpart was significantly higher (38.94%) when compared with reference standard. This was similar to the study by Andi Eka et al[12].

This study found out that knowledge of diabetes significantly affects respondents' fasting blood glucose, BMI and visceral fat ($p<0.05$). Glycemic control is an important predictor for many of the chronic complications of diabetes[13]. This study revealed that dietary compliance was inversely proportional to respondents' fasting blood sugar. Greenfield[14] and Riyadh[15] revealed that compliance was causally

related to improvement in the diabetic controls with statistically significant association between compliance and fasting blood glucose. This study also showed that dietary compliance significantly affected respondents' BMI, body fat percentage and visceral fat ($p<0.05$). Study by Tans et al[16] revealed a significant association between dietary compliance and fasting blood glucose level as well as body fat percentage.

Conclusion

Type 2 diabetes patients in this study had low level of knowledge about diabetes and dietary compliance. This poor level of knowledge and compliance significantly influenced their fasting blood glucose, body mass index, body fat percentage, visceral fat and dietary intake. Therefore, this calls for an urgent diabetes education programs to improve diabetes patients' knowledge, overall wellbeing and prolonged life span of people suffering from DM.

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