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Effects of Poor Glycemic Control Among Type 2 Diabetes Mellitus Patients Attending Diabetic Clinic At Hoima Regional Referral Hospital, Hoima City

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ABSTRACT

The study was descriptive and cross-sectional in design using quantitative methods of data collection and analysis where by opinions and perceptions of type 2 diabetic patients attending diabetic clinic at Hoima regional referral hospital from a relatively large number ofsubjects was collected in a point in time to cater for the generalizations that will be made. The effects of poor glycemic control among type 2 diabetes patients and associated factors attending diabetic clinical at Hoima regional referral hospital were, cardiovascular 56%, diabetic neuropathy 50%, diabetic nephropathy 33%, diabetic retinopathy 25%, and infections 21%. The prevalence of cardiovascular conditions was high in patient with familyhistory, hypertension and high BMI and overweight patients and in patients age >60 years, highly educated, married and professional working patient. The greatest effect of poor glycemic control was cardiovascular complications. The hospital management system should create some opportunities and time for the patients to be taught on how they can manage their conditions not only by taking their medications but also to work on some the factors that would hinder them from properly having good glycemic control. Encouragement of early diagnosis of non-communicable diseases through ways like community out-reaches, screening of every hypertensive patientfor DM and others.

Keywords: poor glycemic control, type 2 diabetes mellitus, blood sugar

INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder of blood sugar control that occurs when thepancreas does not produce enough insulin or when the body cells fail to respond to circulating insulin [1-5]. Type 2 diabetes affects a majority of people in the world [6-10]. According to the 2016 World Health Organization (WHO) Global Report on Diabetes, the prevalence of diabetes and risk factors has been increasing steadily with the numbers now at2.7% and 3.0% for males and females, respectively. About 18.6% of adults are overweight and 3.9% are obese [11]. Global prevalence of diabetes has been on the rise, and statistics show a threshold increase indiabetes prevalence between the year 2000 and 2014. In 2017, approximately 421 million people around the world had diabetes, and this figure was expected to rise to 693 million people by the year 2045 [12-14]. Suboptimal glycemic control is pervasive among patients with type-2 diabetes in sub-SaharanAfrica and poses a significant public health challenge [15-16]. While urgent interventions are required to optimize glycemic control in this region, these should consider sociodemographic,lifestyle, clinical, and treatment-related factors [17-20]. In 2017, around 15.5 million adults in the age of 20 to 79 years in Africa had diabetes, representing a regional prevalence of 6%. By 205, it is projected that about 40.7 million adults will have diabetes. Moreover, Africa has high percentage of people with undiagnosed diabetes. Most people are unaware they have diabetes which raises the risk of chronic complications leading to increased morbidity and mortality are reported on the global estimates of diabetes prevalence [21-25]. A study done in Kanungu district showed a high prevalence of type 2 diabetes observed in this study compared to studies done in previous years which raise a public health concern. This study also found that females and patients aged 61-65 years were most affected by type2 diabetes. Lastly, the presence of family history for diabetes, overweight, and being obese increases the chances of acquiring type 2 diabetes [26-30].

METHODOLOGY

Study design

The study was descriptive and cross-sectional in design using quantitative methods of datacollection and analysis where by opinions and perceptions of diabetic patients from a relatively large number of subjects was collected in a point in time to cater for the generalizations that will be made.

Study area

The study was done in Hoima regional referral hospital, Hoima city.

Study population

Type II diabetic patients enrolled on care in the Clinic at Hoima hospital were my studypopulation and the assessment

was done when they came for review on a clinic day.

Inclusion criteria

All type II diabetic patients attending the clinic for 2nd visit and above who consented toparticipate in the study
All the patients to participate in the study had to be sound of minds

Exclusion criteria

Type II diabetic patients too sick to answer the questions

Sample size determinations

Sample size is calculated using Kish and Leslie formula as follows; n = Z2 p (1-p) E2 Where;n = estimated minimum sample size required, z = reliability coefficient at 95% confidence interval (standard value of 1.96) 19
p = the proportion of patients of 40 years in who have been diagnosed is 7.1% (Mubende hospital annual report 2014) d = margin of error at 5% (standard value 0.05) therefore fromthe formula above q = 1-p (probability measure of the proportion)

n = (1.96x1.96) x0.071x0.929/ 0.05x0.05 n = 3.8x0.071x0.1929/ 0.0025
n = 100 respondents

Sampling procedures

In this study, a simple random sampling procedure was employed in which 200 pieces ofpaper were made and numbers from 1 to 200 were written on these pieces of paper. Theywere folded and put in a bucket. Patients were made to pick and whoever picked an evennumber was my respondent. The patients were then screened to assess if they met the inclusion criteria and good enough, they all met the criteria. So, they were interviewed toacquire the further information.

Data collection methods and management

Data was collected using researcher administered structured questionnaires with both openand closed ended questions that are filled by the researcher and research assistants after asking the respondents and listening to their responses. help the respondents to interpret questionnaires. At the end of the session, the completed questionnaires are to be collected immediately and an appreciationnote is given to respondents

Data analysis

The study findings and results were presented in a summary report providing a comprehensive overview of the patients" perception about effects of poor glycemic control intype II Diabetes mellitus". The main expected outcome measure is knowledge about the effects of poor glycemic control among type II Diabetes patients.

Ethical considerations

The ethical study approval was sought from Kampala international university- western campus (Faculty of Clinical Medicine and Dentistry) and Hoima hospital director. Informed consent was sought from diabetic patients while assuring them of the utmost confidentiality regarding their information in the study Information from the study sample was sought in a language (Luganda, Runyoro, and English) that was understandable to them and the opportunity to ask questions was given and appropriate clarification provided. Participation inthe study was voluntary and no physical risks to patients in this study were anticipated.

RESULTS

Table 1: showing the number of patients with diabetes in relation to the different socialdemographic factors

Age range	**Number of participants**		**Level of education**	**Number of participants according to level**
18-24	16		Never studied	**41**
25-44	20		primary	35
45-60	**45**		secondary	18
61 and above	19		university	6
Occupation	**Number of participants**		**Marital status**	**Numbers of marriedand unmarried participants**
Ordinary job	**66**		Married	***53***

Professional workers	34		Non married (widowed)	47

The major social demographic factors that were interviewed included but not limited to, Age of the patient, level of education of the patient, marital status and occupation, from the data collected most of the patient were aged between 45-60 (45% of the study group), patients who had no study history at all were the highest, 41% of the group, patients with professionaljobs were much of the victims, 34%, compared to the counterparts with ordinary life survival jobs, 66%, and the married people presented more than the un married, 53% and 47% respectively. Therefore, social demographic carries great impact in patients with Type 2 DM.

Table 2: showing the number of participants in relation to the different clinical factorsthat lead to poor glycemic control

Clinical factors	**Number of participants with specific clinical factor.**
Obesity and BMI	34
Family history	48
Hypertension	56
Obesity + hypertension	21
Family history + hypertension	12
Family history +obesity	9
Hypertension + obesity + family history	5

As seen from the study, most of the patients had a co-morbidity of hypertension with diabetes56(56%), those with family history followed by 48(48%) and obesity and high BMI levels were 34(34%).
Other participants hard two or more of the clinical features as seen above on the table.

Table 3: showing the number of participants that presented with specific effects of poorglycemic control and those in relation to the specific clinical factors affecting glycemic control

Effect of poor glycemic control	**Number of participantswith particular effects**	**Clinical factors - number of participants with particular relations**		
		Family history	hypertension	BMI and obesity
Cardiovascular disease	56	**30**	***55***	**49**
Diabetic neuropathy	50	**15**	**40**	***33***

Diabetic nephropathy	33	**5**	**35**	**41**
Retinopathy	25	**8**	**37**	**42**
Infections	21	**11**	**27**	**32**

From the table above, majority of the participants, 56%, had cardiovascular disorders as themain effect assessed, then neuropathy 50%, nephropathy 33%, retinopathy 25% and infections 21%. In relation to the clinical factors, cardiovascular effects presented in patient with familyhistory, hypertensive and those with high BMI and over-weight, 30%, 55%, and 49% respectively.

Table 4: showing the relationship between the effects of poor glycemic control andthe different social demographic factors of each participant in the study

Effects	**Age ranges**				**Level of education**				**Marital status**		**Occupation**	
	18 - 24	**25 - 44**	**45 - 60**	**>60**	**non**	**pri**	**sec**	**uni**	**married**	**unmarried**	**regular**	**professional**
CVS disease	9	18	27	**46**	12	14	29	**35**	**57**	43	48	**52**
Neuropathy	7	14	27	**52**	**40**	23	11	26	40	**60**	**58**	42
nephropathy	10	16	30	**34**	25	18	14	**43**	**61**	39	**56**	44
Retinopathy	13	25	25	**37**	**45**	20	20	15	42	**58**	**67**	33
Infections	15	23	**38**	24	**40**	23	19	18	**65**	35	**70**	30

The effects of poor glycemic control were assessed her in relation to the different socialdemographic factors of each participant of the study. Cardiovascular disease is one of the major complications/ comorbidities that Type 2 DMpatients present with, patients aged >60present with high levels of CVS disorders, 46%, highly educated patients, 35%, the married, 57% and the professional workers, 52%. Neuropathy predisposes Type 2 DM patients to a number of complications, patients age >60years, un educated, unmarried and the ordinary workers are much more affected, 52%, 40%,60%, and 58% respectively. Nephropathy in patients with Type 2 DM is common at ages >60, 34%, highly educated,43%, married, 61%, and regular workers, 56%. Retinopathy is as well common at old age 37%, un educated, 45%, the unmarried, 58%, andregular workers, 67%. Infections are times driven by some of the complications like neuropathy and nephropathy and is seen common in ages 45-60 year, un educated, married and regularly working patientsof Type 2 DM, 38%, 40%, 65% and 70% respectively.

DISCUSSION

The results of the study reveal that majority of the participants 64(64%) were 45 years and above, 0nly 36% were below 40 years. This was allattributed to the fact that older patients had better experience of the disease condition and good managerial skills than the younger patients. In the study, majority of the respondents 59(59%) were found to possess formal education and these included primary, secondary and tertiary levels. In the study, only 41% of the respondents were illiterate. This is important and can positively impact on acquisition of knowledge on issues to do with their health and the attributes of good health hence an improved lifespan among type II diabetic patients [27-33]. Majority of the respondents 53(53%) were married and were staying with their partners and this is important because it can positively impact on some of the lifestyle modification measures in respect to knowledge, and practice especially in the areas of adherence, physicalexercises and dietary modifications whereby the partner acts as a supporter of their spouse tokeep remind them of the lifestyle modification measures and also

provide socio-economic support to enable the patient carry on with glycemic control in the prevention of outcomes ofpoor glycemic control [28-34]. Occupation has an impact on glycemic control and from this study majority of patients 66 (66%) were those with ordinary jobs compared to those with professional jobs 34 (34%), thisis because of the knowledge that the educated people have and so they are able to deal with the conditions that come in with diabetic control and also because of their income earnings that allow them to practices life style modifications to help control their sugar levels. Family history of type 2 diabetes is associated with early manifestation of high glucose levelsin the blood and thus leading to early manifestation of features of poor glycemic control, 48% of participants had a family history diabetes showing the relationship of poor glycemic control and family history [29-36]. Half of the participants presented with neuropathy 50%, this showed great impacted of poorglycemic control to patients. Diabetic nephropathy is one the complications that comes in due to poor glycemic control measures, 33%, of the participants had already developed nephropathy.

CONCLUSION

Of the effects of poor glycemic control analyzed, cardiovascular, neuropathy and nephropathy were much more related to the clinical and social demographic factors associated with poor glycemic control, thus showing that the effects of poor glycemiccontrol are influenced by a number of factors which leads to poor outcome of patientquality of life. Infections and retinopathy were not so manifest in many participants showing thatbesides the patients not controlling their sugars well, at least they have tried to do their best with other ways involving medication and regular clinical visits.

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