



Medication Adherence Evaluation among Diabetic Patients attending a Secondary Health Facility in Northern Nigeria

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Research Article

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Abstract

OBJECTIVES. Despite significant advances in medicine, diabetes has remained a major medical challenge. This threat to global health is escalating and rapidly worsening. The increase in prevalence of diabetes mellitus and the emergence of complications of diabetes made it necessary to assess adherence to anti-diabetic medication. The main aim of this research work was to evaluate patient's adherence to their prescribed medications.

METHOD. This work was conducted at a secondary health facility in north western Nigeria. A total of 30 patients were used for this study .Data were obtained from both case records and an interviewing questionnaire. The inclusion criteria were established type 2 diabetes and informed consent form was filled prior to the study. The information obtained includes patient's demographic data, diabetic history, prescription pattern, laboratory investigations and results.

RESULTS. Data analysis was simple descriptive statistic in form of percentages. 18 patients were females and 12 were males.17 patients (56.6%) always took their medication on time as prescribed. 20 patients (66.7%) always complied with dietary regimen while 10 patients reported regular adherence with exercise regimen. Ignorance of importance of adherence and or with financial reason was the commonest cause of non-adherence. The result of the blood samples revealed glucose level in 56.6% of patients. Adherence to therapy was found in 27% of the study subject. Metformin was found to be the most prescribed drug, either in mono or combination therapy.

CONCLUSION. Patient's adherence with most of the diabetic regimen was low. The patient-physician relationship was found to be poor which perhaps may be the cause of patient's lack of

knowledge about the disease. There is a need to improve patient's knowledge of diabetes in order to promote sound management of the disease.

Keywords: *Diabetes Mellitus, Medication Adherence, Nigeria.*

Introduction

Diabetes is a major global health problem, with challenging epidemiology ^[1]. This threat to global health is escalating and rapidly worsening ^[2]. The increasing prevalence of diabetes mellitus, the emergence of complications of diabetes as a cause of early morbidity and mortality, and the enormous mounting burden on health care systems make diabetes a priority concern ^[3]. Between 1995 and 2025, the number of the adult population affected by diabetes mellitus in developing countries is projected to grow by 196% from 84 to 228 million people ^[4]

The care of diabetes involves some changes in lifestyle, including dietary habits and regular intake of medication ^[5]. Successful management of diabetes relies on patient's self-care ^[6]. Adherence is a key element in health care and affects all of its areas ^[7]. The degree of patient's adherence to diabetes self-care is the extent to which patients carry out the set of daily activities recommended to them by a health care professional as a means of managing their diabetes. These include dieting style, exercise, taking medication, monitoring of blood glucose, foot care as well as the timing and integration of all of these activities ^[8].

The problem of poor compliance or adherence to prescribed treatment is very complex ^[9]. It is the principal cause of development of complications of diabetes and their associated individual, societal and economic costs ^[10]. There are many factors affecting compliance relating to the patient, the disease, the physician, and the family ^[5]. Patients and caregivers interpret signs and signals differently. These differences in perspective are not inherently problematic. They frequently become so when patients do not meet the goals and expectation of their health care providers ^[9]. Adherence is a primary



determinant of the effectiveness of treatment [10,11]. Proper adherence improves the effectiveness of interventions aimed at providing healthy lifestyles, such as diet modification, increased physical activity, non-smoking and safe sexual behavior [12; 13]. The development of more effective behavioral strategies to promote adherence is needed to achieve maximum benefit to the patient [6].

Few studies about patient's adherence to oral hypoglycemic agents (OHAs) in Nigeria have been published, but most of these studies were carried out in Southern Nigeria. A study was performed in South west on Adherence to antidiabetic drug therapy and self-management practices. Effect of numbers and type of antidiabetic's medications on adherence and glycaemia of ambulatory type 2 diabetes was also conducted recently in the South west. Adherence research among patients on chronic medications including type 2 diabetes is a challenge especially in developing countries like Nigeria [14]. Adherence to antidiabetic medications and self-care among type 2 diabetes is of essence. Such studies are scarce in Northern Nigeria.

This study is aimed at evaluating adherence to medication among type 2 diabetes mellitus patients attending a secondary health facility in Northern Nigeria.

Material and Method

This study was carried out at the endocrinology outpatient clinic of Hajia Gambo Sawaba General Hospital (HGSGH), Zaria. Located in North-western Nigeria. HGSGH is a 150-bed secondary health facility. It has a diabetic clinic where different categories of ambulatory patients within and outside Zaria receive treatment. Ethical clearance and approval for the study was obtained from the Hospital management. Oral informed consent was sought and received from the patients prior to commencement of the study.

The study consisted of two phases. A retrospective review of case notes for details of prescribed medications and blood glucose values, and a prospective study using a pre-tested structured questionnaire among type 2 diabetic patients, recruited from the outpatient clinics of the hospital. Between 20th March and 21st April 2011.

Inclusion criteria for all participants were: patients ≥ 18 years of age, who had been diagnosed with type 2 diabetes at least 1 year earlier, who receive oral hypoglycemic medications. Exclusion criteria are patients who suffer from chronic complications and those who declined to participate.

A random sample of 30 case notes of patients with type 2 diabetes who attended the outpatient diabetes clinic of HGSGH, Zaria. The questionnaire was divided into sections: A. Sociodemographic data, including sex, age, occupation, marital status. Section B. Clarified information on knowledge of the disease condition, duration of illness, number of hospital admission, prescribed medication. Section C. Was on Adherence, in the study, a 'yes' or No response was used, self-

care knowledge was asked using an open-ended question format. The questionnaire took about 25 minutes to complete. It was administered to patients by the principal investigator on every diabetic clinic day. The retrospective data from case notes of the patients were retrieved using a pre-piloted data collection form.

Data was analysed using a descriptive statistics including frequency distribution

Results

Data analysis was simple descriptive statistic in form of percentages. 18 patients were females and 12 were males. Table 1. Indicated that patients above the age of 40 years have an adherence rate of about 57%. On the reason for non-adherence with antidiabetic medication, Table 3. Showed about 66.66% to be lack of finance or cost of drugs, While 13.33% indicated that side-effects of the prescribed drug and perceived inefficacy of the drugs were the reasons for non-adherence. Only 10% indicated difficulty in dosing regimen as a reason.

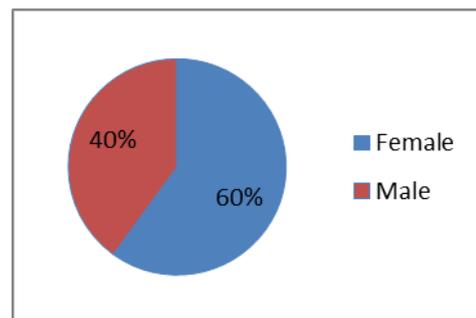


Figure 1: Sex distribution of Diabetic Patients in HGSGH.

Course of Disease:

Following the WHO criteria, 17 patients have their fasting blood glucose level below 7.0mmol/L (< 7.0 mmol/L) which is control. While 13 patients have fasting blood glucose level of ≥ 7.0 mmol/L which is uncontrolled

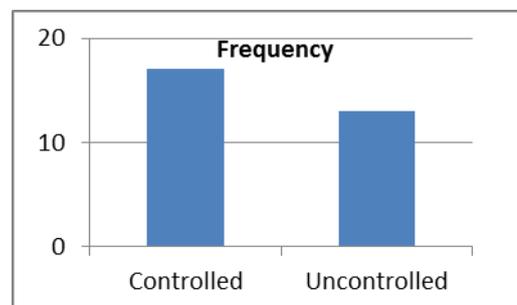


Figure 2: Course of Disease among Diabetic Patients in HGSGH



Table 1: Relationship between Age and Adherence among Diabetic patients attending a northern Nigerian secondary health facility

Age	Adherent		Non-adherent	
	frequency	%	frequency	%
20-39 years	3	10	5	16.67
>40 years	5	16.67	17	56.66

Table 2. Oral hypoglycemic agents prescribed for Type 2 Diabetic Patients in HGSGH.

Anti-diabetic drug	usual dose	Frequency	%
Metformin	500mg	16	53.3
Glibenclamide	5mg	10	33.3
Chlorpropamide	250mg	2	6.7
Tolazamide	50mg	2	6.7
Total		30	100

About 66.66% of the respondents showed they do not follow exercise regimen while 66.66% follow the dietary regimen. On regular home blood glucose monitoring, 76.66% indicated they do not monitor their blood glucose at home. Table 4. Shows that 33.33% of the patients go to the hospital occasionally or when they are sick. 53.33% never go for follow-up visits. Table 2. This showed the single most prescribed drug is Metformin (Biguanide) 53.33%, while Chlorpropamide followed with a 33.3%. Table 5. Showed the presence of diabetes mellitus related complication, Diabetes retinopathy 16.66%, Diabetic Neuropathy 6.67% and Diabetic ketoacidosis 6.67%.

Discussion

From the study conducted, 18 patients were females and 12 were males (figure 1). This is similar to what was obtained in some past studies globally, indicating that there are higher incidences of diabetics in female than male [15, 16]. However, in some other reports, there were higher incidences of male than female patients of type 2 diabetes mellitus [17, 18, 19, 20]. There was significant relationship between age and the rate of adherence, majority of the patients that comply were above the age 40 years, in addition, the highest rate of non-adherence was about 57% (table1). Majority of patients visiting tertiary health facilities are highly educated and high salary earners. Unlike secondary hospitals that are mostly visited by the less educated and lower income earners who knows little or nothing about their illness [20]. This finding is in contrast with the work of [21] who reported that high percentage of patients who always complied with taking medication on time and as prescribed were 35 to <45years. Elderly people tend to have impaired or physical disability that may hinder their ability to take their medication on time and as prescribed [22]. 20 patients (66.7%) always complied with dietary regimen while 10 patients reported regular compliance

with exercise regimen. This finding was however not in consistence with studies that reported that regular exercise, medications and dietary modifications were all used in the self-management of diabetes in order to improve the quality of life of patients [23, 24].

Table 3. Determinants of non-adherence with drug therapy and profile of self-management practices among type 2 diabetic patients.

n=30	%
<u>Reasons for non-adherence (n=30)</u>	
Lack of finance	66.66
Difficulty in dosing regimen	10
Side effects	13.33
Perceived inefficacy of drug	13.33
<u>Exercise control</u>	
Yes	33.33
No	66.66
<u>Dietary control</u>	
Yes	66.66
No	33.33
<u>Regular home blood glucose measurement</u>	
Yes	23.33
No	76.66
<u>Knowledge of complications due to poor glycemic control</u>	
Yes	30
No	70

Number of Hospital Visits

According to the hospital policy of visit which is every 2-4 weeks, 46.7% of the study population visits the hospital every 4 weeks, while 33.3% of the population visits the hospital occasionally.

Table 4: Number of Hospital visits among Diabetic Patients in HGSGH

	Frequency (%)	
Every 2 weeks	6	20.0
Every 4 weeks	14	46.7
Occasionally	10	33.3
Total	30	100

Table 5: Complication of Diabetes Mellitus in a group of 30 patients attending HGSGH

Complication type	Frequency (%)	
Diabetic Retinopathy	5	16.6
Diabetic Neuropathy	2	6.7
Diabetic keto-acidosis	2	6.7
No Complication		21
		70.0
Total	30	100



Presence of Diabetic Complication

9 patients had diabetic complication while the remaining 21 patients had no discernable complication.

Ignorance of compliance importance and/or with financial reason were the commonest reasons for non-adherence (Table 2). This is not in agreement with a result published by [25], who reported that alcohol use, medication side effects and few clinics located far from most patients were the factors contributing to non-compliance to diabetes treatment. Metformin was found to be the most prescribed drug, either in mono or combination therapy. This is similar to a study which reported that the most commonly prescribed antidiabetic drug class was biguanides (metformin) [26]

Conclusion

Low-adherence to medication regimen is common among patients with diabetes and is related to poor glycemic control. Lack of finance, perceived inefficacy of drug and poor knowledge and practice of self-management behaviours were important factors associated with low adherence. An improvement with medication adherence may be achieved through continuing patient education about the disease, improvement of person's socio-economic level through government assistance in reducing costs of drugs in the hospitals and encouraging patients to monitor their blood glucose level regularly

Limitations

The sample size was small but was representative.

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References

1. Lawal M (2008). Management of diabetes mellitus in clinical practice. *Br J Nurs* (17) 17:1106-13.
2. WHO. Guidelines for the prevention, management and care of diabetes mellitus. In: Khatib OM, editor. WHO / EMRO Technical Publications series No. 32. Cairo: WHO/EMR, 2005.
3. World Health Organization. Global burden of diabetes Available from: (last accessed on 2014 Feb 28)
4. Mehta RS, Karki P, Sharma SK, (2005) Risk factors associated health problems, reason for admission and knowledge profile of diabetes patients admitted in Bpkihs. *International journal of diabetes development*. 25:70-3.
5. Khattab MS, Abolfotouh MA, Khan MY, Humaidi MA, Alkaldi YM (1999). Compliance and control of diabetes in a family practice setting, Saudi Arabia. *East Mediterranean Health Journal*. 5:755-65.
6. Lai WA, Chic WC, Lew-Ting CY(2007). How diabetic patients' ideas of illness course affect non-adherent behavior: qualitative study. *British Journal of General Practice*. 57:296-302.
7. Chatterjee JS (2006) From compliance to concordance in diabetes. *Medical Ethics* 32:507-10.

8. McCabe BA(2003). Barriers to adherence in a free medication program for low income individuals with type 2 diabetes. A Dissertation Submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree of Doctor of Philosophy. Psychology Department. Louisiana: Louisiana State University and Agricultural and Mechanical College, 2003.

9. Wens J, Vermeire E, Royen PV, Sabbe B, Denekens I. Perspectives of type 2 diabetes patients' adherence to treatment. A qualitative analysis of barriers and solutions. *Boston Medical Center Family Practice* 2005;6:20

10. The World Health Report 2002: Reducing Risks, Promoting Healthy Life. Geneva, World Health Organization , 2002

11. Cramer JA. Consequences of intermittent treatment for Hypertension: The case for medication compliance and persistence. *American Journal of Managed Care*, 1998, 4 : 1563-1568

12. Clark DO. Issues of adherence, penetration and management in physical activity effectiveness studies. *Medical Care*, 2001, 39: 409-412

13. Rayman RB. Health Promotion: a perspective. *Aviation Space & Environmental Medicine*, 1988, 59 :379-381

14. Cramer JA. A systematic review of adherence with medications for diabetes .*Diabetes care*.2004; 27(5) 1218-1224

15. Edo AE. Clinical profile and outcomes of adult patients with hyperglycemic emergencies managed at a tertiary care hospital in Nigeria. *Niger Med J* 2012; 53:121-5.

16. Hayes RP and Fitzgerald JT Perceptions and attitudes are primary contributors to insulin delivery system satisfaction in people with type 2 diabetes. *Diabetes Technol Ther* 2009;11:419-26.

17. Arnetz L, Dorkhan M, Alvarsson M, Brismar K and Ekberg NR. Gender differences in non-glycemic responses to improved insulin sensitivity by pioglitazone treatment in patients with type 2 diabetes. *Acta Diabetol* 2014; 51:185-92.

18. Kramer HU, Raum E, Ruter G, Schottker B, Rothenbacher D, Rosemann T, Szecsenyi J and Brenner H. Gender disparities in diabetes and coronary heart disease medication among patients with type 2 diabetes: results from DIANA study. *Cardiovasc Diabetol* 2012; 11:88.

19. Yufu K, Takahashi N, Okada N, Wakisaka O, Shinohara T, Nakagawa M, Hara M, Yoshimatsu H, Saikawa T. Gender difference in baroreflex sensitivity to predict cardiac and cerebrovascular events in type 2 diabetic patients. *Circ J* 2011;75:1418-23.

20. Franck N, Lanne T, Astrand O, Engval J, Lindstrom T, Ostgren CJ, Nystrom FH. Cardiovascular risk factors related to the PPRAY Pro12Ala polymorphism in



patients with type 2 diabetes are gender dependent. Blood Press 21:122-7.

21. Adibe M.O, Ukwe C.V. Assessment of Hospital Pharmacy Services in South- Eastern Nigeria. International Journal of Pharmagenesis (IJPG). July, 2010; 1(2).209-215

22. Ibrahim NK, Attia SG, Sallam SA, Fetohy EM, El-Sewi F. Physician therapeutic practice and compliance of diabetic patients attending rural primary health care units in Alexandria. Journal of Family and Community Medicine 2010;17 (3) : 121-8..

23. Sweileh WM, Aker O, Hamooz S (2005). Rate of compliance among patients with diabetes mellitus and hypertension. An-Najah Univ. J.Res (N.Sc).Vol.19.

24. Huang MC, Hung CH, Stocker J , Lin LC. Outcome for type 2 diabetes mellitus patients with diverse regimens. J CLIN Nurs 2013; 22:1899-906.

25. Rahim-Williams B. Beliefs, behaviours and modifications of type 2 diabetes self-management among African American women. J Natl Med Assoc 2011; 103:203-15

26. Fedrick F and Justin-Temu M. Factors contributing to non-adherence to diabetes treatment among diabetic patients attending clinic in Mwanza city. East Afr J Public Health 2012; 9:90-5.

27. Sultana G, Kapur P, Agil M, Alam MS, Pillai K K. Drug utilization of oral hypoglycaemic agents in a University teaching hospital in india. J Clin Pharm Ther 2010;35: 267-77.

AUTHORS' CONTRIBUTIONS

Authors contributed equally to all aspects of the study.

PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.