

Assessment of Drug Compliance Among Diabetic Patients

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ABSTRACT

Objective: Assessment of compliance in diabetic patients to anti-diabetic medications.

Study Design: Descriptive study

Place and Duration of Study: This study was conducted at the Medical Department, Lady Reading Hospital, Peshawar from March 2021 to August 2021.

Materials and Methods: The study was done on 196 diabetic patients of both genders with age above 18 years. All patients with diabetes taking antidiabetic medications were involved. Clinical and demographic details were noted about diabetes duration, name, number and dose of medicine taken and existence of comorbid condition noticed. For data entry and statistical analysis SPSS version 21.0 was used. Chi-square test at p value ≤ 0.05 at 95% confidence level was considered significant statistically.

Results: Amongst 196 patients, 50 (25.5%) were male and 146 (74.49%) were female. Age of the patients age was ranging from 18 to 93(55.99 \pm 10.31) years; 120 (61.2%) were in 40-60 age group and 60 (30.6%) were over 60 years. Compliance was not good in 110 (56.12%) patients and compliance was good in 86 (43.88%) patients; 68 (34.7%) had taken DPP4 inhibitors while 70(35.7%) were on drug combination; compliance was Good in those on begun and combinations (p=0.001).

Conclusion: Most of the patients in our study had poor compliance to anti-diabetic medicine.

Key Words: Drug Compliance, diabetes, Anti-diabetic medications, Comorbidities.

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INTRODUCTION

Diabetes mellitus is the rapidly growing health issue globally. International Diabetes Federation (IDF) has declared that there were 415 million people with diabetes in 2015, with a estimated 642 million by 2040¹. Diabetes is not only a disease of the elderly as about 50% of the patients are aged between 40 and 59 years². The Low income countries are faced with growing burden of diabetes and nutritional diseases³. In a recent study frequency of diabetes in Cameroon is 5.8%⁴, and studies from the Global Burden of Disease (GBD) 2016 study showed that diabetes mellitus is reason for about 132,000 disability adjusted life years (DALY) and about 4000 deaths in Cameroon⁵. So this shows that the load of diabetes on is huge in terms of morbidity as well as mortality⁶. Diabetes management includes change in lifestyle and antidiabetic drugs⁷.

Noncompliance to treatment is a chief hurdle in treatment of diabetes. The struggle done to enhance patients compliance of to treatment are not useful usually⁸. Vrijens et al defined compliance as the limit to which patient follows the recommendations for treatment prescribed⁹. Non compliance includes not beginning the treatment, pharmacy prescription is not filled, taking the dose wrongly, or stopping the treatment early^{8,9}. The technique of compliance assessment to medication includes electronic monitoring method, counting the pills, caregiver and patients reports¹⁰. A study in the UAE hospital revealed a frequency of compliance to antidiabetic drugs as 84%¹¹, whilst studies in Uganda and Ethiopia disclosed frequency of 83.3% and 85.1 respectively^{12,13}. On other hand studies in Botswana and Switzerland showed lower frequency of 52% and 40 respectively^{14,15}. Factors related to non compliance to antidiabetic medication include poverty, young age, forgetting the drugs, education level, diabetic complications and difficulty in taking medication alone^{11,14,16,17}. Non-compliance for antidiabetic drugs results in high healthcare cost for country, higher morbidity and death¹⁸⁻²⁰. Despite of high number of studies on non-adherence to antidiabetic medications, there is scarce information in diabetic patients in Pakistan. So the aim of our study is to firm the frequency and recognize factors related with non-compliance to antidiabetic drugs in type 2 diabetes mellitus patients in our local area. It will help in the management of such patients to

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adhere to the medications and decrease the complications of uncontrolled diabetes.

MATERIALS AND METHODS

This was a descriptive study done in the Out Patient Department of Lady Reading Hospital Peshawar; from 1st March 2021 to 31st Aug 2021. A total of 196 diabetic patients were involved in the study. Size of the sample was calculated using the WHO Sample Size Calculator, with 95% confidence level, 5% margin of error and 15% prevalence population proportion. Consecutive sampling technique was utilised. All adult diabetic patients, of either gender; 18 years of age or above, visiting OPD; taking anti-diabetic drugs for 6 months at least and voluntarily consenting, were included in the study. Patients of age less than 18 unconscious, confused and psychiatric patients were excluded from the study. Diabetes was defined as Fasting blood sugar level > 7.0 mmol/L (or 2 hour postprandial blood sugar level > 11.1 mmol/L). Blood sugar > 11.1 mmol/L.

Drug Compliance was defined as the limit to which a patient follows in accordance with does prescribed and interval of anti-diabetic drug(s). Compliance was calculated in accordance with the proportion of days covered (PDC) by the patient as detailed by David Nau¹¹. The patient taking medications in the last 30 days was found, divided by the total number of days (30) and calculated in percentage. The cutoff value was 80%; score of 80% and above was labelled as 'Good' Compliance and less than 80% was expressed as 'Poor' Compliance. The study was done after Institutional Research Ethical Review Board approval. Written informed consent was taken from all the participating patients. Bio data of all patients were determined. A detailed history was taken from the patient including diagnosis and diabetes duration, drugs history, dose, name, drug frequency, its side effects, cost and compliance to medication. Patient's socioeconomic and education status was determined comorbidities were

recorded. A detailed clinical examination was done by a consultant physician and findings noted. Relevant laboratory investigations like fasting and random blood sugar, glycated hemoglobin, serum urea, creatinine, electrolytes, triglycerides, cholesterol and urine analysis. All information was noted in the predesigned proforma. Patients data were entered and analyses was done using SPSS (IBM Corporation) version 21 software. Mean \pm standard deviations calculation was done for the continuous (numerical) variables. Percentages and frequencies were calculated for all the categorical variables. The statistical significance was set at p value equal to or less than 0.05. Results were presented in the shape of graphs and tables which were compared with local and international studies.

RESULTS

Out of 196 patients considered in the study, 50 (25.5%) were male and 146 (74.49%) were female; Overall compliance for medication in the study patients was 'good' in 86 (43.88%) patients and 'poor' in 110 (56.12%). There was no statistical significant difference between men and women in the two groups, ($p = 0.8$); 43.15% male and 46% female had good compliance. In the same way 56.16% men and 58% women had 'poor' compliance, as shown in Table 1. Age of the patients was ranging between 18 to 93 years; mean age was 55.99 ± 10.31 years.

Among 196 patients, 120 (61.2%) were in 40-60 age group. Compliance in various age groups showed that in the below 40 years group, 6% had good compliance; in 40-60 age group 58% had good compliance; similarly in the over 60 years, 34.88% had good compliance. Nevertheless regarding compliance in various age groups no statistical variation between the groups ($p = 0.45$) was noted as shown in the Table 2. Diabetes mellitus type 2 duration ranged from 1 to 20 years with mean of 6.63 ± 3.992 years. Duration significantly correlated with compliance to medication ($p < 0.001$).

Table No.1: Gender and compliance to medication

Compliance to medication		Gender		Total
		Male	Female	
Poor compliance	Within compliance	82/110(74.55%)	28/110(25.45%)	110(100%)
	Within gender	82/146(56.16%)	28/50(58%)	110/196(56.6%)
Good compliance	Within compliance	63/86(73.26%)	23/86(26.74%)	86(100%)
	Within gender	63/146(43.15%)	23/50(46%)	86/196(43.4%)
Total	Within compliance	146/196(74.48%)	50/196(25.5%)	196(100%)
	Within gender	100%	100%	100%

Table No.2: Age groups and compliance to medications

Age groups	Compliance to medication		Total
	Poor compliance	Good compliance	
Less than 40 years	10(9.09%)	6(5.88%)	16(8.2%)
40 to 60 years	70(63.63%)	50(58.14%)	120(61.2%)
Above 60 years	30(27.27%)	30(34.88%)	60(30.6%)
Total	110(56.12%)	86(43.88%)	196(100%)

Table No.3: Drug groups and compliance to medications

Drug groups	Compliance to medication		Total
	Poor compliance	Good compliance	
Biguanides	9(8.18%)	14(16.27%)	23(11.7%)
Sulphonylureas	2(1.82%)	1(1.16%)	3(1.5%)
DPP4 inhibitors	55(50%)	13(15.11%)	68(34.7%)
GLP 1 receptor agonists	20(18.18%)	12(13.95%)	32(16.3%)
Combination of drugs	24(21.8%)	46(53.48%)	70(35.7%)
Total	110(100%)	86(100%)	196(100%)

The number of antidiabetic drugs utilised was ranging between 1 to 5 with mean 3.98 ± 1.705 . Among 196 patients, 68 (34.7%) were on DPP4 inhibitors whilst 70 (35.7%) were on drug combination. Compliance related to drug groups is displayed in Table 3. Patients taking biguanides and combinations were having good compliance whilst those on DPP4 inhibitors were having poor compliance. The correlativity of compliance with drugs was significant ($p < 0.001$).

Among 196 diabetic patients 73 (37.2%) patients were having no comorbidities. 123 (62.8%) patients were having various comorbidities. Amongst these 123 patients commonest comorbidity was dyslipidemia in 47 (24%), perused by Hypertension in 27 (13.8%) patients. CKD was the least common comorbidity and noted in 1 patient. The correlativity of comorbidities with compliance was having no significance ($p = 0.877$).

DISCUSSION

Medication compliance is a global problem as reported from various regions; some studies are in agreement with our study while others are in contrast to ours, as explained below. Compliance to medication in our study was 'good' in 43.4% patients and 'poor' in 56.6%. Gender wise no statistical significant difference between the two groups ($p = 0.8$) was noted. Compliance in 43.15% male and 46% female had good compliance. Mean age of our patients was 55.99 ± 10.31 ; 61% were between 40-60 years and 30% were above 60; however, there was no substantial variation among various age groups ($p = 0.45$). Poor antidiabetic medications compliance was mostly due to younger age, alcohol abuse, placement on insulin therapy, Forgetfulness, financial problem, symptoms disappearance and being too busy. 54.4% of our study patients were having poor compliance to their antidiabetic medications. A same result was noted in Malaysia by Ahmad et al.²¹ they determined that 53 percent of their participants were noncomplaint to drugs. Other study done by Abebe et al. in Ethiopia expressed a frequency of 54.1 percent²⁶. nevertheless low rate of non-compliance was noted in Uganda¹³, Palestine²⁸ and Nigeria²⁷ showing rates of 16.7, 42% and 27.5% respectively. This variation in levels of adherence can be due to differences in socio-economic conditions. In multiple studies, patients over 60 years

were having a 52% lower odds of non-adherence to their drugs in contrast to those less than 60 years. This is in accordance with studies elsewhere²⁹ that non-compliance to drugs is commonly found in younger patients³⁰, less knowledge of disease, side effect fears and complicated regimen³¹. Old patients having long disease period are more aware from diabetes and the significance of blood sugar control for prevention of complications¹². Patients on insulin alone has two times more non-adherence in contrast to patients on oral hypoglycaemic agents. Insulin is injected via subcutaneous route³². Affordability is another issue as insulin price is also higher³³. A twice increase in non-compliance occur with abuse of alcohol. Use of Alcohol decreases frequency of patient's visit to hospitals³⁴. Our result is same to those of Ahmed et al who noted that abuse of alcohol was related with poor compliance to diabetic medications³⁵. Forgetfulness and low economy for buying medications is noted as very common reason for poor compliance³⁶. Jingi et al. Identified the medicine Affordability for Diabetes as great issue in the West region of Cameroon³⁷. Forgetting the dose is also a serious issue. To treat forgetfulness of patients, regularly arranged follow up visiting is needed, counselling with members of family are needed³⁸. Mobile technology for sending motivating message reminders have shown improvement in compliance to drugs in HIV patients³⁹. Diabetes care providing institutions can gain from such studies to for improving drug compliance in diabetic patients with diabetes. Jimmy et al suggested recognition of patient issues to drug compliance and adaptation for appropriate methods can improve drug compliance⁴⁰. Our study has some limitations as it was conducted in the OPD and Private Consultation Clinic where the patient's reported compliance might not be true representation of community; a community based study will be more suitable to determine the true compliance to medications. on the other hand our study has slot of merits, as a valid 21 medicine compliance tool was utilised. This is amongst the fewer struggles in Pakistan to provide evidence on antidiabetic medication in type 2 diabetes mellitus patients. These results will be important for policy makers and government when they plan strategy to improve control of diabetes in Pakistan.

CONCLUSION

Most of patients in our study had non-adherence to anti-diabetic drugs. There was no statistical variance between various age groups and gender in relating to compliance. Beguindes and combination of drugs had good compliance. More studies are needed to determine various factors responsible for poor compliance to anti-diabetic medications.

Author's Contribution:

Concept & Design of Study: Muhammad Abas Khan
 Drafting: Muhammad Abas Khan
 Data Analysis: Muhammad Abas Khan
 Revisiting Critically: Muhammad Abas Khan
 Final Approval of version: Muhammad Abas Khan

Conflict of Interest: The study has no conflict of interest to declare by any author.

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