ORIGINAL ARTICLE

ASSESSMENT OF COMPLIANCE OF DIABETIC PATIENTS AT NISHTAR HOSPITAL MULTAN, PAKISTAN

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ABSTRACT

Background: Diabetes mellitus is a major metabolic disorder. The word compliance describes the extent to which the patient's behavior matches with health care provider's recommendations .The aim of this study is to determine the rate of compliance among diabetic patients at Nishtar Hospital, Multan, Pakistan to investigate the risk factors for non compliance and estimates the relevant association among different variables.

Material and methods: A descriptive cross-sectional study was conducted in different wards of Nishtar Hospital Multan, Pakistan including diabetic center and general medical wards during the period extending from the beginning of November 2011 to April 2012. Simple random sampling was done to select 350 male and female patients with fixed drug therapy for the last 6 months. Data was collected by a personal interview using structured open ended questionnaire in patient's mother language & patient's medical history record.

Results: The overall non compliance rate was 36%. compliance with diet was much better than compliance with medication and visits .The rate of non compliance with medications & with regular visits frequency was 37.5% & about 42.2% respectively. Factors that showed significant association ($p < 0.05$) with non compliance were age groups, education levels, and duration of disease, dosage regimen, diet & follow-up visit frequency.

Conclusion: Data indicates a high rate of non compliance among diabetic patients in Nishtar Hospital Multan, Pakistan & there is a need for improvement in our healthcare system.

Keywords: Diabetes; Diabetes mellitus; HB1c; Non compliance.

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INTRODUCTION

At present diabetes mellitus (DM) is a major metabolic disorder. It is characterized by hyperglycaemia with carbohydrate, fat and protein metabolism impairment due to defects in insulin secretion, action, or multiple aetiology. It can cause long term damage, dysfunction & failure of different organs.[1] According to an estimation about 30 million people worldwide had diabetes in 1985 [2] & this value was increased up to 135 million in 1995.[3] The worldwide prevalence rate of diabetes was estimated to be 2.8% in 2000 and 4.4% in 2003 for all age-groups.[4] It was expected to rise to 220 million in 2010 and is expected to rise to 300 million in 2025.[4] Due to the magnitude of the burden of disease, Health People 2010 objectives had the goals of minimizing diabetes-related death and increasing the check and balance frequency of glucose control and chronic complications.[5] According to a cross-sectional survey that was conducted in the rural & urban areas of all provinces of Pakistan, the prevalence rate of diabetes is up to 7.6 to 11% in Pakistan [6] & Newly diagnosed diabetes in urban areas was 5.1% in men and 6.8% in women and in rural areas 5.0% in men &4.8% in women.[7]

The word compliance describes the extent to which the patient's behavior matches with health care provider's recommendations.[8] These recommendations include taking medications at right time, right dose & bringing lifestyle changes i.e. smoking cessation, right eating and having the right kind of

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physical activity on daily basis because diet (sometimes combine with exercise if possible), oral hypoglycemic and insulin are the major components of treatment of diabetes.[9] Participation of patients up to significant extent is very necessary to achieve treatment goals and diabetes care is almost always carried by patients.[10] Hence noncompliance means that patients disobey the recommendations of their health care providers. It is either attributed by forgetfulness, lack of will power or low level of education.[11] Different types of noncompliance are therapeutic non-compliance (failure to have the prescription refilled, doses omission, dosage errors, administration error, wrong time and frequency of administration, and discontinuation of the prescribed drug regimen), dietary noncompliance (not following the diet recommendations) & appointment noncompliance (patient fails to go for regular checkup).[12] The noncompliance consequences can be very dangerous for patient's own health. According to a study the non compliance rate is up to 80% among the patients suffering from chronic diseases viz diabetes, hypertension and TB etc.[13]

In our knowledge there is no published data on assessment of rate compliance of diabetic patients at Nishtar Hospital Multan, Pakistan.

The aim of this study was to determine the rate of compliance among diabetic patients at Nishtar Hospital, Multan, to investigate the risk factors for non compliance and estimates the relevant association among different variables.

MATERIAL AND METHODS

This was a descriptive cross-sectional study and was conducted in different wards of Nishtar Hospital Multan, Pakistan including diabetic center and general medical wards. The study was conducted in the period from the beginning of November 2011 to April 2012. Nishtar Hospital Multan, Pakistan is a tertiary care hospital, serving a large population of South Punjab. At present the total bed capacity of Nishtar Hospital is up to 1800, which is one of the largest in the country. Now this hospital has 24 departments and divisions, over 30 wards, a diabetic unit, a burn unit, out patients and emergency department & 15 operation theatres.

A simple random sampling was done to select diabetic patients from selected diabetic unit & selected wards of the Nishtar Hospital Multan. 350 male and female patients with fixed drug therapy for the last 6 months were selected. The participants have been registered in the Nishtar Hospital Multan and they got their medication from the Nishtar Hospital Pharmacy regularly.

Compliance has been estimated by a personal interview using structured open ended questionnaire in patient's mother language & from patient medical records. The questions included in the questionnaire were about socio- demographic data of participants, their medication history, follow up visit frequency & related to duration of disease. Patients having greater than 75% points are considered in the good compliance group. Patients having less than 50% of the points are in the noncompliance group, and the patients having point between 50 and 75% are in the poor compliance group. The questionnaire checks all aforementioned kinds of compliance. This categorization was tested and validated by Girerd X et al 2001.[14] The participants were informed about the aims of the study before data collection, and then sought their consents.

Descriptive analysis was conducted by calculating means and proportions for data. Chi square tests were used for inferential analysis to identify relation amongst variables. Analysis was done by SPSS software package. To determine the association between variables, $p < 0.05$ was supposed to be significant.

RESULTS

Out of 350 participants, only 320 participants responded accurately. This gives the response rate of 91.4%. Results of participant's degree of compliance are shown in Table 1. The percentage of noncompliance, poor compliance and good compliance is 35%, 45% and 20% respectively. It shows a strong relationship among these variables.

Factors affecting the compliance rate are 1).Socio demographic factors (Table 2) shows the effect of gender, different age groups, participants having different education & socio economic status on degree of compliance and the relation between these variables & compliance. In case of gender, 144 were males and 176 were females while in males and female noncompliance, poor compliance and good compliance rate was 31.3%, 45%, 23% and 36.4%, 46.6%, 17% respectively. On the basis of age groups, it can be seen that older participants (>55years)

Table 1: Degree of compliance among participants.

Group	Number of patients	Percentage
Non compliance	112	35%
Poor compliance	144	45%
Good compliance	64	20%

Table 2: Socio demographic factors affecting degree of compliance.

Personal Factors		Numbers of participants	Numbers of Patients of non compliance (%)	Numbers of Patients of poor compliance (%)	Numbers of Patients of compliance (%)
Gender	Male	144	45 (31.3)	65 (45)	34 (23.6)
	Female	176	64 (36.4)	82(46.6)	(30) 17
Age	< 35 years	25	4 (16)	7 (28)	14 (56)
	35-55 years	169	61(36)	49 (30)	59 (34.9)
	> 55 years	126	65 (52)	21 (16.6)	40 (31.7)
Education	Illiterate	122	47 (38)	40 (32.7)	35 (28.6)
	Middle	104	35 (33.7)	42 (40.3)	27 (25.9)
	High	94	18 (19.2)	36 (38.2)	40 (42.5)
Socio economic status	Poor	165	65 (39)	60 (36.3)	40 (24.2)
	Middle class	145	38 (26.2)	(58) 40	76 (52.4)
	Elite class	10	0(0)	(3) 30	7 (70)

Table 3: Therapeutic and dietary factors affecting compliance behavior.

Factors	Relevant effects on lab tests	Values	Numbers of Patients of non compliance (%)	Numbers of Patients of poor compliance (%)	Numbers of Patients of compliance (%)
Diet			95 (29.6)	109(34.1)	116(36.3)
	FBS mg/dl	≤ 140	55 (57.9)	52(47.7)	65(56)
		>140	40 (42.1)	57(52.2)	51(43.9)
	HbA1 (%)	<7	20 (21)	35(32.1)	49(42.2)
		7-8	35 (36.8)	37(33.9)	40(34.5)
		> 8	40 (42.1)	36(33)	27(23.2)
Medication			120 (37.5)	116(36.3)	84(26.3)
	FBS mg/dl	≤ 140	42 (35)	65(56)	64(76.1)
		>140	72 (60)	51(43.9)	20(23.8)
	HbA1 (%)	<7	25 (30)	34(29.3)	38(45.2)
		7-8	32 (26.6)	49(42.2)	26(30.9)
		> 8	58 (48.3)	53(45.6)	20(23.8)
Visits			135(42.2)	121(37.8)	64(20.6)
	FBS mg/dl	≤140	62(45.9)	78(64.4)	45(70.3)
		>140	73(54)	43(35.5)	19(29.6)
	HbA1 (%)	<7	45(33.3)	45(37.2)	30(46.8)
		7-8	40(29.6)	38(31.4)	21(32.8)
		> 8	50(37)	38(31.4)	13(20.3)
Route of administration	Oral	110 patients	63(57.27)	21(19.09)	26(23.64)
	Injectables	90 patients	31(34.4)	24(26.7)	35(38.9)
	Both	120 patients	52(43.3)	38(31.6)	30(25)
Duration	<3years	90 patients	8(8.9)	13(14.4)	60(66.7)
	3 – 10yrs	85 patients	31(36.5)	28(32.9)	26(30.6)
	>10yrs	145 patients	65(44.9)	45(31)	35(24.13)

were more non compliant (52%) as compared to younger & average age groups. Illiterate participants because of lack of education were more non compliance (38%) to treatment than educated patients. It is also evident from the table that participants who were belong to poor family, have showed more non compliant behavior (39%) as compared to that of middle & elite class groups. This data also depicted that illiteracy rate and poor financial status is also one of the causes of non compliance behavior of patients.

2) Therapeutic & dietary factors are summarized in table 3 which show the relation between degree of compliance with dietary management, therapeutic management of diabetes and various other determinants such as follow up visit frequency. Compliance with diet was much better than compliance with medication and visits .The rate of non compliance with diet, medications and regular visits frequency was 29.6%, 37.5% & about 42.2% respectively where as FBG and HBA1c values in this population are shown in table 3 which show better results in case of compliance with diet as compare to compliance with medication and visits frequency. Poor compliance rate with these factors (diet, medication and visits) remains 34.1%, 36.3% and 37.8% respectively table 3. Good compliance rate was observed due to diet which was 36.3% as compare to medication (26.3%) and visits frequency (20.6%).From data it showed that about 57.27% participants (on oral medications) were non compliant. 44.9% participants who had diabetes for more than 10 years were more non compliant while those, having diabetes for less than 3 years period showed more compliant behavior (66.7%) which depicted that with increasing elapsed time, participants will become less compliant. It is shown in many studies that people with diabetes who reduce their HbA1c level by 1% are 19% and16%, less likely to suffer cataracts and heart failure respectively where as in our study it is clear that compliance rate is better by diet than medication and visits frequency which also has shown reduced HbAc1 level table 3.

DISCUSSION

It is a complex issue to measure the degree of compliance of diabetic patients because several factors such as the extent of adherence to dietary recommendations, medications, and follow up visit frequency etc. Socio demographic factors also play an important role in assessing the degree of compliance among participants.

The present study showed that the highest percentage (51.6%) of diabetes was seen in the age group (35 - 55 years). In a study, in developing countries, the majority of diabetic patients were in the age group of 45- 64 years.[4]

In our study, there is no significant association between compliance and gender. These results comply with study previously conducted in same field.[3]

In this study, highly educated participants were more compliant. There exists significant relationship between education and compliance rate. Ghods et al[15] found similar results in their study.

In this study, compliance with diet was much better than compliance with medication and visits while according to a previously conducted study, patients were more non compliant with diet protocols rather than medication and visit follow ups.[16] Only 29.6% off our study participants were non compliant with diet, this could be attributed to the lack in knowledge that can be improved by informative educational programs, by spending more time on counseling of patients regarding diet.

To the best of our knowledge, yet there is no published study regarding drug compliance among diabetic patients in Pakistan unfortunately. So comparison with these results is not possible. However, compliance assessment have been determined by different researchers in different countries i.e. in Saudi Arabia (65%) [17], in India (up to 75%).[18] Our study has showed similar results compared to their data.

Data showed that on oral medications participants were more non compliant. Data showed significant relationship between route of administration and compliance behavior.

Glycemic control is an important test for diabetes .About 42.2% of participants with good diet compliance had below 7% HBA1c, a study reported that the degree of HBA1c control was found to have a significant association with the degree of compliance & diet.[14]

About 37.5 % participants were non compliant to drugs; out of which 48.3% had HBA1c > 8.

Our study depicted that with increasing elapsed time, participants will become less compliant. Non compliant behavior showed by our study data that multiple dosage regimen increases the rate of non compliance. These results comply with various studies previously conducted.[19-21]

It can be concluded from this study that diabetic patients (represented by our selected sample) have poor compliance attitude with medications and visits, these were the most common variable found to predict compliance behavior.

CONCLUSION

Our study is the first to assess the degree of compliance in patients of diabetes registered at Nishtar Hospital Multan. This study encourages our health care system to intimate strategies to reduce non-compliance rate and mortality rate of diabetes. By improving the physician-patient communica-

tion, pharmacist patient counseling, the self-care techniques, distributing health manuals, education and information through the electronic media, patient's compliance behavior can be improved.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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