

Factors affecting compliance to management of diabetes in Urban Health Center of a tertiary care teaching hospital of south India

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Abstract

Aim: To Study the Factors affecting compliance to diabetes management and study risk factors and complications of type II diabetes. **Settings and Design:** Primary health center, Descriptive study. **Materials and Methods:** A descriptive study of previously diagnosed diabetics ($n = 135$) attending the chronic disease clinic of Urban Health Center, Jawaharlal Institute of Postgraduate Medical Education and Research (JIUHC) was carried out during October 2011 to December 2011. Data were collected by personal interview on demographic parameters, duration of diabetes, number of doses missed in the last 15 days, co-morbidities, knowledge and practice of dietary modification, physical activity, self-care, family support, awareness about risk factors and complications of diabetes. **Statistical Analysis Used:** The findings were expressed in terms of proportions. Chi-square test was used to study the association between socio-demographic factors and compliance. **Results:** Majority of patients were in the age group of 50-59, of which 80% were females. Compliance (defined as not missing more than two doses in the last 15 days) to oral hypoglycemic agents was found in 103 (76%; 68.5-82.9). Dietary modifications was practiced by 110 (81.4%; 74.2-87.3) and 37% (29.2-45.4) practice physical activity. Annual eye check-up was carried out by 43.7%, renal function test by 46.6% and foot care by 54%. Knowledge regarding risk factors (66%; 42.7-59.4) and complications (79%; 71.8-85.4) was comparatively better than knowledge about self-care. **Conclusions:** Three-fourth of patients were compliant to medications and diet, but less than half follows modifications in physical activity and other self-care practices. Hence, it is essential to educate and motivate people in primary health-care level about self-care and life-style modifications.

Key words: Compliance, diabetes mellitus, drugs, self-care

INTRODUCTION

Estimates of global diabetes prevalence predicts 6.4% in 2010 affecting 285 million adults and will increase to 7.7% and 439 million adults by 2030.^[1] The International Diabetes Federation reported that the total number of diabetic subjects in India is 63 million in 2010 and this would rise

to 73.5 million by the year 2025.^[2] Increased prevalence in India is attributed to the life-style transition coupled with urbanization, industrialization and life-style changes.^[3]

Management of diabetes includes pharmacological and non-pharmacological measures. Pharmacological measures includes regular and timely intake of medications.

Non-pharmacological measures include dietary modifications, physical activity, tobacco cessation, foot care and regular follow-up. Optimal glycemic control depends on self-care in the form of compliance to dietary modifications, medications, regular follow-up, foot care and physical activity. Treatment of diabetes mellitus (DM) is a life-long process and requires constant motivation from patient and depends upon regular supply of medications and attitude of health-care providers.

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Non-compliance is believed to be the most common cause of treatment failure. Non-compliance leads to lack of metabolic control, which contributes to development and acceleration of diabetic complications.^[4-6] There are several methods used to measure compliance of which methods such as self-reports and interviews with patients are the simplest and most common methods for measuring compliance.^[7] Non-adherence in chronic disease has been described as taking less than 80% of the prescribed treatment.^[8] Studies show compliance is about 50% for medications in chronic diseases and much lower for life-style prescriptions. The consequences of medication non-compliance may not only be dangerous for patients health, but also dramatically increase the financial cost of public health services.^[4-6] This study was carried out to find out various factors affecting compliance such as age, gender, literacy, knowledge about the disease and complications and associated co-morbidities, in a primary health-care setting. Knowledge about risk factors and complications in patients with type II diabetes was also evaluated.

MATERIALS AND METHODS

A descriptive study was conducted among patients with type 2 DM attending the chronic disease clinic at Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) Urban Health Center, which provides holistic care to 2367 households covering a population of 9,383. Patients with diabetes are provided with free medications and followed-up once in 15 days. The study was conducted over a period of 3 months during 2011. All diabetic patients attending the chronic disease clinic were contacted; informed consent was obtained and interviewed. Data collection was carried out by trained interns using a pre-tested structured questionnaire and supervised by the investigators. Data on socio-demographic factors, details on diabetes and co-morbid conditions were collected using a structured questionnaire. History of adherence to medications, dietary modifications, foot care, physical activity and follow-up care were recorded. Awareness about risk factors and complications of diabetes were also collected.

Patient compliance to medications was measured by recall method and recording number of missed doses over 15 days prior to the date of interview. Interns were trained on administration of questionnaire, data collection process and they were supervised by the investigators. Operational definition for pharmacological and non-pharmacologic management was as follows. Pharmacological compliance was defined as the failure to take more than two doses of anti-diabetic medication over a period of last 15 days.

Compliance to physical activity was defined as newly initiated activity after being diagnosed with diabetes and carried out for a minimum of 150 min/week. For the purpose of this study, a patient was considered to be compliant to their diet if had reduced the quantity and increased the frequency of food intake. As we did not get any standard definition for compliance, we consulted the experts and decided the definition.

Data was entered and analyzed by using the SPSS for Windows (Statistical Package for Social Sciences) version 16.0. The findings were expressed in terms of proportions. Chi-square test was used to study the association between socio-demographic factors and compliance. *P* value less than 0.05 was considered as statistically significant.

RESULTS

A total of 135 subjects were included in the study. Baseline characteristics of the participants are depicted in Table 1. Majority (74.8%) of patients were more than 50 years of age, with a mean age of 59 (+12.0) years. Majority (80%) of patients was females and around 47.4% were literates. Majority (62.2%) of the study population were unemployed. Around 62.2% of patients were diagnosed with diabetes for the duration of less than 4 years. About 59.2% of the study population had at least one associated co-morbidity such as hypertension, asthma, osteoarthritis etc., [Table 1].

Level of compliance to pharmacological treatment among the patient studied was 76.3%. The reasons quoted by patients for not being compliant was they forget to take

Table 1: Socio-demographic and other characteristics of respondents (N=135)

Characteristic	Participants (%)
Age in years	
<50 years	34 (25.2)
≥50 years	101 (74.8)
Gender	
Female	108 (80)
Male	27 (20)
Education status	
Literate	64 (47.4)
Illiterate	71 (52.6)
Occupation	
Employed	51 (37.8)
Unemployed	84 (62.2)
Duration of DM	
<4 years	84 (62.2)
>4 years	51 (37.8)
Co morbidity	
Yes	80 (59.25)
No	55 (40.74)

DM=Diabetes mellitus

medications (63%), side-effects (22%) and rest (15%) was not collecting medications from the center due to reasons such as going out of station, inability to come to center to collect medications. We did not find any significant association between age and gender with compliance. Short duration of diabetes less than 4 years since the diagnosis non-significantly increased the chance of compliance. Literacy status was significantly associated with compliance [Table 2].

Around 77% of patients reduced the quantity of food intake, but only 50.3% of them increased the frequency of food intake. Only 37.03% of them practiced physical activity. Around 54% of patients practiced foot care. Only 43.7% and 46.6% of them did annual eye check-up and renal function test respectively [Table 3].

Regarding awareness on diabetes risk factors, around 66% patients were aware about at least one risk factor of DM, which included dietary factors ($n = 73$), hereditary ($n = 31$), stress ($n = 21$), sedentary life-styles ($n = 10$). 107 of 135 (79.3%) knew at least one complication such as eye diseases ($n = 64$), kidney diseases ($n = 44$), heart diseases ($n = 33$) or neuropathy ($n = 12$) [Table 4].

DISCUSSION

This study was undertaken in Urban Health Center of JIPMER among 135 diabetes patients to assess their compliance to diabetes management. Majority of the patients are female this is because of the timings of chronic disease clinic. In our study, compliance was significantly associated with literacy level of patients, literate people tend to appreciate and understand the consequences of non-compliance; thus, degree of compliance increase with increasing level of education of patients this is similar to other study.^[9]

Compliance was lower in patients with duration of diabetes more than 4 years compared to those with duration less than 4 years, but it was not statistically significant similar to the study conducted in Poland.^[10] In our study, compliance to pharmacological treatment is 76%, which is higher compared to another study conducted in India. The level of non-compliance is similar to study conducted in Uganda.^[5] The level of non-compliance found may be underestimate this is because self-report was used to assess the non-compliance, further patients may have a problem with recall of medication taken in past 15 days.

Decrease in quantity of the meals are practiced more than change frequency of meal since working hours and economic constrains often hinder the increase in frequency of meals.

Table 2: Association between demographic characteristics of the participants and compliance to treatment (N=135)

Variable	Compliance (%)	Non-compliance (%)	P value
Age in years			
<50 years	26 (25.7)	8 (23.5)	0.797
>50 years	75 (74.3)	26 (76.5)	
Gender			
Female	79 (78.2)	29 (85.3)	0.372
Male	22 (21.8)	5 (14.7)	
Education			
Literate	57 (54.2)	8 (27.6)	<0.05
Illiterate	48 (45.7)	21 (72.4)	
Occupation			
Employed	36 (35.6)	15 (44.1)	0.378
Unemployed	65 (64.4)	19 (55.9)	
Duration of DM			
<4 years	66 (65.3)	18 (52.9)	0.197
>4 years	35 (34.7)	16 (47.1)	
Comorbidity			
Yes	58 (57.4)	22 (64.7)	0.453
No	43 (42.6)	12 (35.3)	

DM=Diabetes mellitus

Table 3: Compliance to pharmacological and non-pharmacological treatment (N=135)

Compliant measures	Compliant (%)	Non-compliant (%)
Diet		
Reduction in food quantity	105 (77.7)	30 (22.2)
Increased food frequency	68 (50.3)	67 (49.6)
Physical activity	50 (37.03)	85 (62.9)
Pharmacological treatment	103 (76.2)	32 (24)
Foot care	73 (54)	62 (45.9)
Eye check-up	59 (43.7)	76 (56.2)
Kidney function test	63 (46.6)	72 (53.3)

Table 4: Knowledge about risk factors and complications of diabetes (N=135)

Knowledge	Present (%)	Absent (%)
Name at least one risk factor	89 (66)	46 (34.07)
Complications	107 (79.2)	28 (20.7)

Only 37% patients were practicing physical activity this is because majority (53%) of the patients is more than 50 years of age. Awareness among the patients regarding foot care (60%), annual eye check-up (49%), renal function test (51.1%) is less. Majority (56.2%, 53.3%) of patients were not doing annual eye examination and renal function test respectively. Around 66% of patients were aware about at least one of the risk factor of diabetes. Majority 79% knew about at least one of the complication of diabetes.

Non-compliance to diabetic management is likely to increase the complications and increase the cost of health-

care and decrease productivity of the affected person. One limitation of the study was compliance was tested based on the self-report (recall bias).

CONCLUSION

In our study population compliance to pharmacological treatment was 76% and was significantly associated with literacy level of the patients, but the compliance to physical activity, foot care, annual eye and renal check-up was low and hence strategies should be formulated to give health education, reinforcement and motivation to increase self-care practices with regard to diabetes control.

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