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Research Article

Adherence to treatment among type 2 diabetes mellitus patients visiting a tertiary care hospital in Mangalore

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Abstract
Introduction: Diabetes Mellitus is a disorder that requires lifelong treatment but many patients are not adherent to therapy. This study looked at the adherence to Diabetes therapy
Material and methods: This cross sectional study was done by interviewing Diabetes Mellitus patients attending Father Muller Hospital medicine outpatient clinics. Adherence to medication, diet and exercise were assessed.
Results: Medication adherence was 71.3%. Those who missed medications mentioned lack of motivation, lack of availability, fear of side effects and other factors. However even non pharmacological measures like exercise was followed regularly by only 54.3% patients and diet by 76.2% of patients
Keywords: Diabetes, Insulin, Adherence, Oral hypoglycemic agent, Diet, Exercise

1. Introduction

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels[1].

Type 2 Diabetes mellitus is a serious metabolic disorder that has become increasingly prevalent throughout the developing world[2]. India has an estimated population of 63 million diabetic subjects[3]. In diabetes, macrovascular disease is the commonest cause of mortality and morbidity and is responsible for high incidence of vascular diseases such as stroke, myocardial infarction and peripheral vascular diseases[4]. Lifestyle modifications and pharmacotherapy plays an important role in the prevention of these complications. Chronic diseases like Diabetes Mellitus require that the patient takes medications regularly on a long term basis to achieve euglycemic status required to prevent long term complications. Adherence is defined as the ability and willingness to abide by a prescribed therapeutic regimen[5]. Non-adherence to treatment is a major obstacle in tackling the consequences of Diabetes mellitus. The common reasons for non-adherence include chronic nature of the illness, lack of knowledge, fear of side effects, financial burden, forgetfulness, etc[6].

Various studies have shown compliance rates for long-term medication therapies was between 40% and 50% while compliance for short-term therapy was much higher at between 70% and 80%, and the compliance with lifestyle changes was the lowest at 20%–30% [7]. Diabetes Mellitus is a chronic disease which requires lifelong treatment for the prevention of complications. Hence it is important that the patient is adherent with the treatment.
This study was therefore undertaken to find out the percentage of people who are non-adherent to pharmacological as well as non-pharmacological measures and the factors responsible for non-adherence.

2. Material and Methods

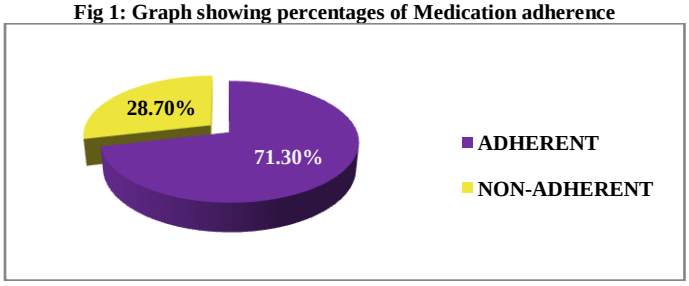
Patients with type 2 Diabetes Mellitus attending medicine outpatient clinics at Father Muller medical college hospital, Mangalore were interviewed using a structured questionnaire by the authors. A written informed consent was obtained prior to the interview from people who participated. The questionnaire enquired about various aspects including the duration of Diabetes, nature of the medications, adherence to medications and presence of complications. A total of three hundred patients were interviewed. Adherence was defined as patients having never missed their medications in the past one month prior to the interview. The rest of the patients were classified as non adherent.

3. Results

A total of 300 Type 2 Diabetes Mellitus patients who were interviewed were included, of which 168 patients were males and 132 were females. Majority of the patients were in the age group of 40-80 years. Among the participants, 214 were adherent to the medication treatment while 86 were non – adherent i.e., 71.3% and 28.7% respectively. [Fig 1]

3.1 Medication adherence

Fig 1: Graph showing percentages of Medication adherence



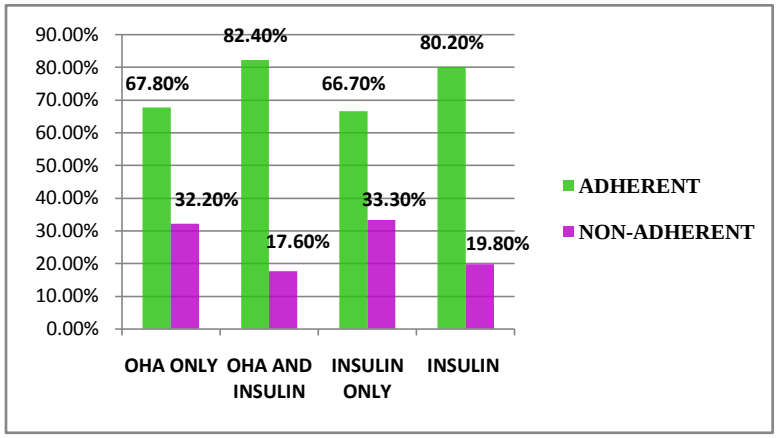
The duration of Diabetes mellitus was found to be longer in medication adherent patients. The average duration in adherent patients was 8.5 years. On the other hand in non-adherent patients, it was 6.7 years.

3.2 Adherence to various treatment regimes

In this study, out of the 300 participants, 214 (71.3%) were exclusively on oral hypoglycemic agents, 74(24.7%) of patients were both on oral hypoglycemic agents and Insulin and 12(4%) were exclusively on Insulin.

Among patients exclusively on oral hypoglycemic agents, 145 (67.8%) were adherent while 69 (32.2%) were not adherent. Among patients on both oral hypoglycemic agents and Insulin, 61 (82.4%) were adherent while 13 (17.6%) were non-adherent. In the subgroup of patients exclusively on Insulin, 8 (66.7%) were adherent while 4 (33.3%) were non-adherent. Adequate glycaemic control was observed in only 24.3% and the control was inadequate in 75.7% of patients. [**Fig 2**]

Fig 2: Adherence to various treatment regimes

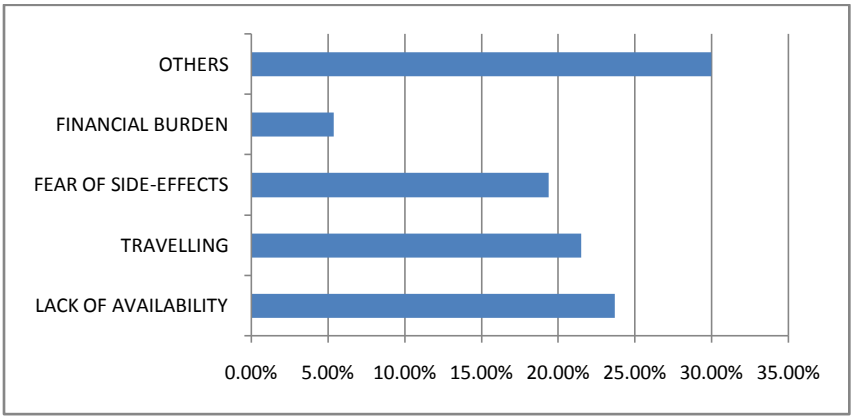


Of the total participants, 54.3% follow exercise regimes like walking, jogging, running and others (yoga).Among the medication adherent patients, 76.2% followed the prescribed diet regimen while only 60.5% of the medication non-adherent patients followed dietary advice .A history of alcohol intake was seen in 22% of the medication adherent patients and 32.6 % of the non-adherent patients.

Among the non-adherent patients, 43% of them have missed their medications more than once in a week, 30.2% once in a week and 26.8% occasionally.

3.3 Reasons for missing medications

Fig 3: Reasons for missing medications



The most common reason for missing medications constituting 30% comes under the category 'Others' , which includes lack of motivation , forgetfulness, tiredness, alternative medications, too many medications, long duration of treatment, neglects due to drinking, sugar control by diet.[Fig 3].

The mean distance from the patients' home to the hospital is 11.5 km in adherent patients and 13.6 km in non-adherent patients. 79.4% of the adherent and 58.1 % of the non-adherent patients are coming for regular follow-ups.

77% of the diabetics had complications in this study. It includes both macrovascular (ischemic heart disease, CVA, peripheral vascular disease) and microvascular (neuropathy, nephropathy, and retinopathy) complications. In a study by Gebrehiwot et.al[8] it was 71.9%.

3.4 Analysis

In this study, there is a male preponderance with males constituting 56% while there is a slight female preponderance (50.5%) seen in Ramachandran[9] *et al* study. Majority of the patients were in the age group of 40-80 years.

The percentage of patients adhering to medications in our study is 71.3% which is almost equal to the findings in other similar studies. In a study by Fredrick et.al[10], medication adherence was found to be 71.7% and Shams et.al[11] study found it to be 61%.

Table 1. Medication adherence

	Medication adherence
Our study	71.3%
Fedrick *et al*[10]	71.7%
Shams *et al*[11]	61%

Table 2. Type of treatment

	OHA only	**OHA + Insulin**	**Insulin**	**Insulin only**
Our study	71.3%	24.7%	28.7%	4%
Shuvankar *et al*[12]	48.9%	36.8%	52.1%	15.3%

In our study, patients on Insulin constituted 28.7% of the total while in a study by Shuvankar *et al*[12], it was as high as 52.1%. Only 4% of the patients are on Insulin monotherapy, which is comparable with other studies. Our study found that 71.3% of the patients were being treated with oral hypoglycemic drugs solely.

3.5 Adherence to exercise

The percentage of patients adhering to exercise according to our study is 54.3%, while it is 70% in a study by Kamiya et.al[13] and only 35% in the Dawn[14] study.

3.6 Diet adherence

Adherence to dietary regimens among type 2 diabetes mellitus patients is 76.2% in our study, while studies by Christensen *et al*[15] and Kravitz *et al*[16] have observed it to be 65% and 69% respectively.

4. Conclusion

Adherence to medications is similar to the findings in other studies. Around 30% of patients tend to be irregular with their medications. However non-pharmacological measures need to be emphasized as we found that only 54% are compliant to exercise and 76% adhere to dietary regimens. While the patients in our study were predominantly on OHAs, the patients in other studies were found to be taking insulin to a higher extent .However, the adherence rates were comparable.

Among the reasons for non-adherence, lack of availability was evident in the majority (30%) while lack of motivation, fear of side effects, need to travel long distances for follow up were other important reasons. Financial burden was mentioned only by a very small group.

Physicians need to spend quality time impressing upon their patients regarding the nature of the disease and the need for achieving long term euglycaemic status. Regular and sustained motivation might improve adherence. Public health awareness campaigns by both government and NGOs might prove beneficial.

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