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Original Article

A Cross Sectional Study to Assess Adherence in Type 2 Diabetes Mellitus Outpatients Using Moriskys Medication Adherence Scale-4

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Abstract
Introduction: *Adherence to prescribed medication is a crucial part of patient care and indispensable for reaching clinical goals. In view of long duration of diabetes, there is a requirement to observe adherence to anti diabetic drugs by patients. In this study 4-item Morisky Medication Adherence Scale (MMAS-4) has been used which is validated in the broadest range of diseases and also in patients with low literacy hence is the most widely used scale for research purposes.*
Methodology: *It was a cross-sectional descriptive observational study for duration of 12 months. A total 400 known patients of type 2 diabetes mellitus from endocrinology outdoor of tertiary care hospital, were recruited and data collected. Adherence to antidiabetics was assessed using Morisky's medication adherence score (four point).*
Results: *Most commonly observed age group was of 40-50 years (mean age 53.76 + 8.84), with male preponderance (57.5%). 67.5% of total were obese (mean BMI 29.79 + 3.26). Adherence to treatment was medium in 66% of the patients.*
Conclusion: *The adherence observed to treatment in the study was not satisfactory and a multi – faceted approach is needed to improve adherence.*

Introduction

The treatment of chronic diseases like Diabetes Mellitus requires long-term use of pharmacotherapy. The success of treatment depends not only on the use of effective medications but also on the adherence of the patients to the prescribed treatment. Medication adherence is defined by the World Health Organization as "the degree to which the person's behavior corresponds with the agreed recommendations from a health care provider."[1]
The WHO has identified non-adherence as a multi-factorial problem caused by the interplay of factors from any of the following 5 areas: 1) the patient, 2) the condition, 3) the type of therapy prescribed, 4) socioeconomic factors, and 5) health system related factors.[2] Economic factors like the high cost of drugs may also impact adherence in a negative way. In order to decrease the non adherence because of economic burden of patients, the Mukhyamantri Nishulk Dawa Yojana (MNDY) is a scheme in Rajasthan that provides all essential drugs free of cost.

The four point Morisky Medication Adherence Scale (MMAS-4) (Figure 1) is frequently used to assess adherence. More recently the eight point Morisky Medication Adherence Scale (MMAS-8) has been used, however scores of the two MMAS

show similar qualitative and quantitative characteristics.[3]

Our study was aimed to observe patient's adherence to anti diabetic treatment among the endocrinology outpatients of a tertiary care hospital, using the four point Morisky Medication Adherence Scale (MMAS-4). Secondary objective was to counsel and motivate patients to improve adherence.

Methodology

The cross-sectional descriptive type of observational study was carried out among outpatients of endocrinology department of a tertiary care hospital after due permission from institutional research review board.

Patients aged between 40 to 70 years who were known cases of type 2 Diabetes Mellitus (T2DM) and receiving anti diabetic drugs from one year were included in the study after taking an informed consent. Diabetics other than T2DM and complicated T2DM cases requiring admissions were excluded from study.

Sample size was calculated at 95% confidence level expecting 50% adherence (maximum variance) to the treatment of type 2 diabetes mellitus in endocrinology department, SMS Hospital. At the precision (relative allowable error) of 10%, minimum 384 patients of T2DM were required as sample size which was further enhanced and rounded off to 400 patients as final sample size for the study.

Two stage sampling was done. In the first stage, one outdoor day of Endocrinology department at SMS Hospital was selected randomly. In the second stage, every second T2DM patient was randomly selected. Patients fulfilling inclusion criteria were recruited for the study till desired sample size was attained. Data including age, sex and personal history were collected from selected patients attending the endocrinology outdoor in a predesigned study proforma. Patients were then asked about their adherence to past treatment with anti diabetic agents in a standardized MMAS-4 proforma.

Do you ever forget to take your medicine?	Yes	No
Are you careless at times about taking your medicine?	Yes	No
When you feel better do you sometimes stop taking your medicine?	Yes	No
Sometimes if you feel worse when you take your medicine, do you stop taking it?	Yes	No

For each question asked score given was 0 for every "yes" and 1 for every "no". Then the final score was evaluated and stratified as having high, medium and low adherence.

Patients having low or medium adherence were sensitized to be adherent to their prescribed medications in order to obtain complete therapeutic outcome. Also patients having high adherence were encouraged to maintain their adherence.

Results

A total of 400 patients from endocrinology outdoor ward were included in the study. Out of these patients, 230 (57.50%) were males while 170 (42.50%) were females. The patients in this study were between 40-70 years of age. Among these 179 (52.25%) patients were aged between 40-50 years, 107(21.75%) of them were between 51-60 years and 114(26%) patients were above the age of 60 years. A total of 244(61%) patients were strict vegetarians while rest 156(39%) were non vegetarians. A total of 91 (39.56%) out of the male patients gave history of current alcohol intake while 81 (35.21%) Male patients were currently smokers. All the female patients denied any intake of alcohol and smoking, although, tobacco chewing history was present in 33.5% of the females and 52% of males.

66% patients showed medium adherence while 30% had high adherence. Only 4 % patients have been reported to have low adherence to their previously prescribed anti diabetic medications.
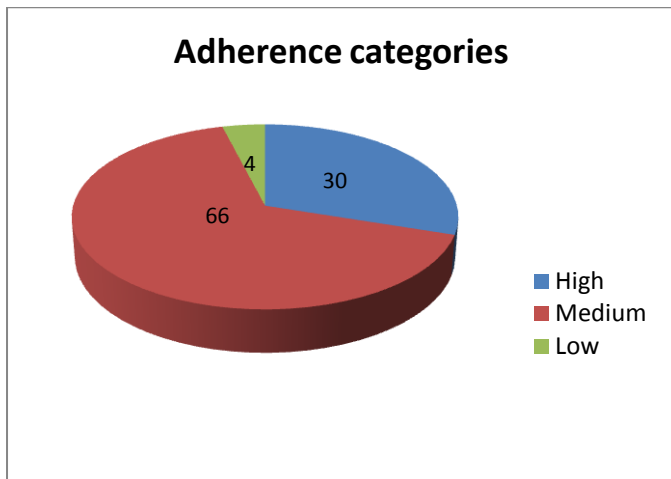
Figure 5: distribution of patients according to their adherence categories

There was no statistically significant difference among males and females in different adherence categories. Mean adherence score observed was 2.08 ± 0.95

Table 6: Distribution of the patients according to the adherence scoring

Adherence Score	Females	Males	P-Value*
0	8	8	
1-2	142	122	0.05
3-4	80	40	
Mean Score $\pm$ SD	2.08 ± 0.95		

*P-Value calculated using Chi Square test

Discussion

After collection of data about T2DM, it was properly analyzed. Among the 400 recruited patients 57.5 % were males and the mean age was 53.76 ± 8.84 years. Indian diabetes federation in 2019 mentioned the age group of 40-59 years to be the most prevalent age group for diabetes.[8] In this study, the recruited patients were asked about their diet, intake of alcohol and smoking habits. In our study, 244(61%) patients were strict vegetarians while rest 156(39%) were non vegetarians. This is in contradiction to the study by Varkey et al[12] where vegetarian patient population was only 23.3%. Diet practices are vastly influenced by the geographical region and religion of patients. This difference may be because of place of study which was rural areas of Kerala where non vegetarian population is predominant.

Out of all, 91(39.56%) male participants stated that they were alcoholic while 40(17.3%) said that they have quit alcohol. Rest denied any history of alcohol intake. 81(35.21%) male participants were smokers. 66(28.69%) said they have quit smoking. Rest gave no history of smoking. All the female participants denied any history of intake of alcohol and smoking although, tobacco chewing history was present in 33.5% of the females and 52% of males. Desai P et al[13] found this percentage very less as compared to our study which was 8.35% alcoholic and 2.35% smokers. The reason for this may be as the study was done in Gujarat where there is a ban on alcohol.

The Multiple therapeutic component and need for life-long treatment makes diabetic adherence a difficult task. Mean adherence score found was 2.08 ± 0.95. In the study, 66% (264) patients showed medium adherence while 30% (120) had high adherence. Only 4 % (16) patients have been reported to have low adherence to their previously prescribed anti diabetic medications.

The findings are similar to 42.9% of 375 patients observed in medium adherence category by Abdullah M Alqarni et al[14] and 37% patients found having moderate adherence by Aloudah NM et al.[15]

This is in contrast to the findings by Arulmozhi S. et al, who found 50% patients having high adherence to anti diabetic treatment in puduchery.[16]

The adherence was not satisfactory despite the free drug scheme in our state. This is a reflection of other causes of non adherence and the need of awareness sessions and patient education about the disease. Adherence can be further improved by counselling, self help groups or mobile applications that can remind them medications.

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