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Therapeutic adherence: A prospective drug utilization study of oral hypoglycemic in patients with type 2 diabetes mellitus

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PEER REVIEW

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Comments

This is a qualitative study carried out to analyze the drug utilization pattern in Indian medical system to diagnose the patient adherence to prescribed therapy. The authors prospected the basic causes of non compliance, negligence of medication.

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ABSTRACT

Objective: To determine the drug utilization patterns and outcomes of treatment in terms of metabolic control in the type 2 diabetic patients on oral hypoglycemic agents in the outpatient department in the teaching hospital of Hamdard University, New Delhi, India.

Methods: Patients with established type 2 diabetes ($n=184$) visiting the outpatient department were interviewed using a structured questionnaire over a period of five months.

Results: Majority of the type 2 diabetic patients in this setting were treated with a multiple oral hypoglycemic agents. The most commonly prescribed oral hypoglycemic agent was biguanides (metformin) followed by sulfonylureas (glimepiride), thiazolidinediones (pioglitazone), alpha-glucosidase inhibitors (miglitol) and dipeptidyl peptidase-4 inhibitors (vildagliptin). As monotherapy metformin was the most common choice followed by glimepiride and voglibose, the most prevalent multiple therapy was a three-drug combination of glimepiride + metformin + pioglitazone. The study showed poor compliance to the prescribed therapy.

Conclusions: This study prospected the need of patient education and counselled to enhance the patient compliance for prescribed oral hypoglycemic agents and concomitant drugs. There is need for diet control as well as blood glucose and HbA1c monitoring. Metabolic control was found to be poor in the study population. HbA1c monitoring was underutilized. Clinical monitoring of patient's adherence to the prescribed treatment to achieve good glycemic control is recommended. Measures should be taken to improve patient's adherence to the prescribed treatment.

KEYWORDS

Drug utilization, Oral hypoglycemic agents, Adherence, Diabetes mellitus

1. Introduction

Diabetes mellitus is a metabolic disorder of multiple etiologies; characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism

resulting from defects in insulin secretion, insulin action, or both with characteristic symptoms of blurring of vision, thirst, polyuria and weight loss[1]. Several pathogenic processes are involved in the development of diabetes include the processes which destroy the beta cells of the pancreas with consequent

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insulin deficiency, and others that result in resistance to insulin action. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction and failure of various organs, especially the eyes, kidneys, nerves, heart and blood vessels. A continuous medical care is essential to prevent acute complications and to reduce the risk of long-term complications by patient's self-management and education^[1]. The number of cases of diabetes worldwide in 2000 among adults ≥ 20 years of age is estimated to be 171 million and is projected to rise to 366 million in 2030. Based on sampling of studies from different parts of the world, the WHO has projected that the maximum increase in diabetes would occur in India^[2]. In recent years, India has witnessed a rapidly exploding epidemic of diabetes^[3,4]. Indeed, India today leads the world with largest number of diabetic subjects in any given country^[4,5]. In 2000, WHO estimated that 31.7 million individuals were affected by diabetes in India and these numbers were expected to increase to 79.4 million by the year 2030^[2]. Indians have a low risk threshold for diabetes because of many reasons^[6].

Drug utilization review is a structured process used to assess the quality of drug therapy by engaging in the evaluation of data on drug prescribing, dispensing and/or patient use in a given health care environment against predetermined, agreed upon criteria and standards^[7]. Drug utilization studies are powerful exploratory tools to ascertain the role of drugs in society. They create a sound socio-medical and health economic basis for health care decision-making^[3]. When drug therapy is indicated, metabolic control depends on adherence to both non-pharmacological and pharmacological treatment. Tight blood glucose control has been correlated with a reduction in diabetic complications. Adherence to prescribed treatment is crucial to achieve this control. In the United Kingdom Prospective Diabetes Studies (UKPDS), patient's adherence to prescribed medications was 40–60%^[8]. Drug utilization studies identify treatment adherence problems or reasons of non-adherence *i.e.*, whether inadequate control is due to missing doses or inadequate prescription. Thus, drug utilization studies design interventions to improve drug use. Drug utilization studies provide physicians with feedback on their performance^[9]. They also assist to design educational programs that may improve prescribing and drug use.

The decision is made to carry out the study with the objective to determine the drug utilization patterns and outcomes of treatment in terms of metabolic control in the type 2 diabetic patients on oral hypoglycemic agents in the outpatient department of Majeedia Hospital, Jamia Hamdard, New Delhi, India.

2. Materials and methods

2.1. Study centre

The study was carried out in the outpatient department of Majeedia Hospital, Hamdard University, New Delhi, India. It was a prospective study of drug utilization patterns in diabetic patients.

2.2. Participants

The subject sample for this study consisted of 84 diabetic

individuals. This study included type II (non-insulin-dependent) diabetes between the ages of 36 and 65 years. All subjects were recruited from clinics. All patients with established type 2 diabetes and those who were on oral hypoglycemic agents attending the hospital were included in the study during the time period of January 2010 to May 2010. Information on age, gender, weight, height, body mass index (BMI), waist to hip ratio (WHR), blood sugar levels, HbA1c levels, drugs prescribed and recommendations on diet and exercise were extracted from clinical records.

2.3. Procedure

Patients were interviewed after informed consent obtained. Interviews were conducted using structured questionnaire (open question method) by direct conversation. In the patient interviews, respondents were asked to either not follow the instructions at all or only follow them partly (noncompliance).

2.4. Measures

The morisky medication adherence scale was originally developed to assess compliance to medication in patients with hypertension and has also been used to measure adherence to antiretroviral therapy in patients who were HIV positive^[10,11]. This simple 4-question survey assessed the likelihood that patients took their drug therapy as prescribed.

Morisky score was used to determine compliance by totaling the number of 'NO' answers to the 4 questions of non-adherence: whether they forget to take their medicine, are they careless to take medicine at times, when they feel better, whether they sometimes skip the dosing and when they feel worse, whether they take or stop the medication^[12].

A higher score on the scale of 0–4 indicated better adherence to treatment (Yes=0; No=1). This technique is simple and straightforward and could be easily incorporated into patient care processes.

3. Results

3.1. Study sample characteristics

Total 184 patients with type 2 diabetes visited hospital out of which 81 (44.03%) were males and 103 (55.97%) were females. The mean age of the patients included in the study was (51.4 ± 12.2) years. The mean BMI of the study population was (25.2 ± 4.2) kg/m², as high as 71.2% male (40.02% female) of the study population (BMI > 23 kg/m²). The mean WHR of the female population was found to be 0.87 ± 0.035 (higher than the acceptable limits of 0.85) and 0.89 ± 0.031 in male population. About 58.7% (68.9% females) of the total diabetic patients had WHR more than the normal limits. Mean waist circumference of the female subjects was (83.46 ± 8.5) cm (higher than the normal, 80 cm) and (85.13 ± 7.39) cm in male subjects; close to 43.5% (59.2% females) of the total patients had waist circumference higher than the acceptable limits. A total of 27.2% patients had a positive family history of diabetes, 50.5% of the type 2 diabetic patients were having a history of diabetes since 2–5 years followed by 14.1% since 5–10 years where 79.9% of the total type 2 diabetic patients were non-

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