Research Article

COMPARATIVE STUDY ON EFFICACY OF METFORMIN AND GLIBENCLAMIDE IN PATIENTS DIAGNOSED WITH TYPE-2 DIABETES

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ABSTRACT

It was estimated that nearly 415 million people were diagnosed with diabetes mellitus, a common chronic disease in modern life in 2015. Only in India there were 69.2 million people diagnosed with diabetes in 2015, making India an epicenter for diabetes. It is calculated that an average of 123.5 million people may present with diabetes by 2040. The main aim of the study is to compare the safety and efficacy of metformin and Glibenclamide in people diagnosed with type-2 diabetes. To make it easier for the health care professionals in selecting an alternative or add-on drug for management of diabetes in patients. Institutional Ethics Committee (IEC) members have approved for the study to be carried out in the respective hospital. After approval for the study, it was carried out for a period of 6 months and the patients were asked to review at regular intervals. Patients newly diagnosed with type-2 diabetes / non insulin dependent diabetes, were enrolled. Metformin accounted with GI related problems and short duration of control of blood sugar levels when compared to Glibenclamide group.

Keywords :- NIDDM, Type-2 diabetes, Glibenclamide, Metformin, Fasting blood glucose.

INTRODUCTION

It was estimated that nearly 415 million people were diagnosed with diabetes mellitus, a common chronic disease in modern life in 2015 [1]. Only in India there were 69.2 million people diagnosed with diabetes in 2015, making India an epicenter for diabetes [2]. It is calculated that an average of 123.5 million people may present with diabetes by 2040 [3]. Among various anti-diabetic drugs available world-wide, metformin is highly accepted as first-line agent for treatment of type-2 diabetes [4]. Increased blood sugar levels are making it necessary to make an add-on to the first line drug for effective management of diabetes [5]. In spite of availability of various sufonylureas and other oral hypoglycemic agents, drugs like glibenclamide, glimepride have been most widely accepted [6]. USFDA has approved only one sulfonylurea that is glimepride for both monotherapy and add-on for combinational therapy of anti-diabetic drugs [7].

Aim and objective
Aim

The main aim of the study is to compare the safety and efficacy of metformin and glibenclamide in people diagnosed with type-2 diabetes.

Objective

To make it easier for the health care professionals in selecting an alternative or add-on drug for management of diabetes in patients.

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MATERIALS AND METHODS

All the study materials required for the study have been collected from the out-patient department of the tertiary care hospital. A copy of informed consent form (ICF) has been submitted to individual patient before making them part of the study. Institutional Ethics Committee (IEC) members have approved for the study to be carried out in the respective hospital. After approval for the study, it was carried out for a period of 6 months and the patients were asked to review at regular intervals.

Study Duration: 6 months

Study population: 25 patients

Study methodology: prospective cross sectional study

Inclusion Criteria

Patients newly diagnosed with type-2 diabetes/ non-insulin dependent diabetes, with or without previous history of hypertension, and other cardiovascular problems. Both male and female are enrolled falling under the age group of 25 to 80 years.

Exclusion criteria

Patients previously diagnosed with diabetes and on medication for anti-diabetic medicines previously, patients with type-1 / insulin dependent diabetes. Patients under the age of 25 years and over 80 years.

RESULTS AND DISCUSSION

Among 25 patients diagnosed with type-2 diabetes, all the patients were randomly divided into 2 groups based on the type of drug prescribed to the patient. Glibenclamide group were the study population who are given with the oral anti-diabetic medicine Glibenclamide for maintaining the blood sugar levels. Metformin group are those who are prescribed with oral use anti-diabetic medicine metformin for maintaining blood sugar levels. Metformin group consisted of 10 patients and Glibenclamide group consisted of 15 patients who have been randomly selected.

It was observed in the study that about 10 patients have been diagnosed with type-2 diabetes falling under the age group of 35-45 years. 6 people in total study population fell under the age group of 46-55 years, 4 people fell under the age group of 56-66 which is represented in table 1.

As represented in the table 2, 13.3% of Glibenclamide group patients were found with pre-hypertension and 20% of metformin patients were diagnosed with pre-hypertension. Various parameters like $HbA_{1c}(\%)$, Mean body weight (kg), Mean BMI(kg/m^2), Mean fasting blood glucose (mg/dl), Mean systolic blood pressure(mm of Hg), Mean diastolic blood pressure (mm of Hg) were evaluated in both the groups.

Table 1. Age distribution of respective groups

Age (years)	Glibenclamide Group	Metformin Group
35-45	8	7
46-55	4	2
56-65	3	1
66-75	0	0
TOTAL	15	10

Table 2. Patients with hypertension in respective groups

Group Name	Number of Patients
Glibenclamide group	2/15(13.3%)
Metformin group	2/10(20.0%)
Total	4

Table 3. Comparison of various parameters in each group

Parameters	Glibenclamide group		Metformin group	
	Initial value	6 months later	Initial value	6 months later
Mean HbA$_{1c}$(%)	7.21% ±0.78	6.7% ±0.55	7.29 ±0.69	7.01±0.54
Mean Body Weight (kg)	67.23±7.25	70.21±7.14	68.54±4.51	66.87±4.66
Mean BMI (kg/m^2)	27.83 ±2.57	28.13±1.85	28.35±1.98	27.89±2.21
Mean Fasting Blood Glucose (mg/dl)	179.04±24.15	140.77±19.58	180.36±22.52	138.96±20.71
Mean Systolic Blood Pressure (mm of Hg)	124±5.9	126±8.5	123.5±5.4	121.5±4.8
Mean Diastolic Blood Pressure (mm of Hg)	77.8±9.54	78.9±8.12	78.4±10.7	76.5±8.44

As represented in the table 3, Mean HbA$_{1c}$(%) was found to be slightly decreased in both the Glibenclamide and metformin groups with a mean difference of 5%, mean body weight (kg) was found to be decreased in patients with metformin use when compared to Glibenclamide group. The mean BMI (kg/m^2) was also decreased in metformin group, whereas, it was increased in Glibenclamide group. Mean fasting blood glucose levels were maintained for long duration in patients with Glibenclamide use when compared with metformin use. Mean systolic blood pressure and mean diastolic blood pressure were found to be decreased in metformin group when compared to Glibenclamide group.

CONCLUSION

From the study results we conclude that the risk of cardiovascular effects are less with metformin when compared with Glibenclamide and the effective management with long term control of blood sugar levels was noticed in Glibenclamide with less side effects. Metformin accounted with GI related problems and short duration of blood sugar control when compared to Glibenclamide. No serious adverse effects have been reported in both the cases. From the study we conclude that Glibenclamide is more preferable to metformin for long term control of blood sugar levels.

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