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MULTICENTER STUDY ON PRESCRIBING PRACTICE OF ORAL HYPOGLYCEMIC AGENTS IN SELECTED HOSPITALS AT BANGALORE CITY

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ABSTRACT

Diabetes mellitus is a carbohydrate metabolic disorder characterized by hyperglycemia, polydipsia, polyuria and polyphagia. The present study was carried out to assess prescribing pattern and general trend of diabetes among patients of South Western Railway Hospital, Bangalore; Indian Railway Hospital, Yelahanka, Bangalore and Kempegowda Institute of Medical Sciences Hospital and Research Center, Bangalore. As per the prescription guidelines, the prescriptions and complete records of diabetic patients were monitored and data was filed. The study revealed that prescriptions of metformin-glimepiride combination (40.91%) were found to be maximum among various available oral hypoglycemic drugs. Category wise the maximum prescribed drugs are Glimepiride alone (15.90%, sulfonyl urea category); Metformin alone (13.07%, biguanide category) was most commonly prescribed followed by the combination of Glimepiride, Metformin and DPP-IV inhibitors (11.82%). Most common disease associated with diabetes mellitus was found to be hypertension. Highest prevalence of disease was found to be in the age group of 51 to 60 followed by age group of 41 to 50. Men patients (60.91%) were found to be predominated over women patients (39.09%).

KEYWORDS: Diabetes mellitus, Prescription, metformin, glimepiride, hypertension.

INTRODUCTION

Diabetes is a carbohydrate metabolic disorder associated with elevated sugar (glucose) levels in the blood.[1] Insulin is a hormone produced by the pancreas lowers the blood glucose. Absence or insufficient production of insulin causes diabetes and symptoms of diabetes include polydipsia, polyuria and polyphagia.[2,3] Diabetes is diagnosed by blood sugar (glucose) testing. The major complications of diabetes are both acute and chronic. Acute complications include dangerously elevated blood sugar, abnormally low blood sugar due to diabetes medications, chronic is related to diseases of the blood vessels (both small and large), which can damage the eye, kidneys, nerves, and heart.[4,5]

Diabetes treatment depends on the type and severity of the diabetes. The two types of diabetes are referred to as type 1 (insulin dependent) and type 2 (non-insulin dependent). Insulin is vital to patients with type 1 diabetes - they cannot live without a source of exogenous insulin. Type-2 diabetes is first treated with weight reduction, a diabetic diet, and exercise when these measures fail to control the elevated blood sugars, oral medications are used. If oral medications are still insufficient, insulin medications are considered.[2,6,7]

Diabetes is among the leading causes of kidney failure, but its frequency varies between populations and is also related to the severity and duration of the disease.[8,9] As estimated, 135 million people worldwide have diagnosed diabetes in 1995, and this number is expected to rise to at least 30 million by 2025.[2,10]

Drug utilization studies are powerful exploratory tools to ascertain the role of drugs in society. These studies create a sound socio medical and health economic basis for healthcare decision making.[11] WHO specifies drug use indicators for adoption in drug utilization studies.[12] Various guidelines are available that recommended for different classes of drugs to treat diabetes.[13]

The present study was conducted to establish the current prescribing pattern of antidiabetic drugs in outpatient

pharmacy departments of South Western Railway Hospital, Bangalore; Indian Railway Hospital, Yelahanka which caters the needs of Railway employees and their dependents and Kempegowda Institute of Medical Sciences (KIMS) Hospital and Research Center, Bangalore, a tertiary critical care hospital, caters the needs of the people from Bangalore and nearby cities. Drug selection indicators selected for present study includes percentage of male and female patients, number and percentage in various age groups, percentage of one/two drug combination, percentage of the utilization of different categories of antidiabetic drugs and percentage of antidiabetic drugs in combination with other category drugs.

The study was performed in all the selected hospitals using prescriptions of around 880 patients suffering from diabetes. Various age group patients and patients with different types of diabetes have been selected for the study. All the data, which was collected from the outpatient department of Pharmacy, were shown in the form of tables. This was a prospective study conducted from July to September 2015 in which prescriptions of newly registered patients was studied. Patient's data such as the age, name, gender and data on prescribed drugs that include name of drug, dosage form, route of administration, most prescribed drug and so on were recorded on a customized data collection sheet. Each drug was counted only once without considering any change in the regimen.

RESULTS AND DISCUSSION

Out of the 880 prescriptions of oral hypoglycemic agents studied, 60.91% were for men and 39.09% were for women indicating that men predominated over women [Table-1]. Maximum patients with Diabetes Mellitus were of the age group of 51 to 60 years followed by the age group of 41 to 50 years [Table-1]. Greater prevalence in this age group may be due to change in life style, lack of exercise and stress. Table-2 indicates that maximum prescriptions are of Glimepiride and Metformin combination (40.91%); Glimepiride alone (15.90%); Metformin alone (13.07%) was most commonly prescribed followed by the combination of Glimepiride, Metformin and DPP-IV inhibitors (11.82%). Table-3: description shows that prescriptions of multiple hypoglycemic agents are in higher percentage (74.10%), out of which the combination with antihypertensive drugs are more (61.00%).

Several studies proved that a combination of sulphonylurea with metformin has been used widely.[14] The present study also showed that a combination of sulphonylurea and metformin was most frequently prescribed (40.91%). As per pharmacoecomics study, the combination of Glimepiride Metformin is accessable, available and affordable, therefore, it seems to be effective.[15] Recent data have suggested that the second-generation sulfonylurea, glimepiride (Amaryl) may be associated with a lower incidence of hypoglycemia and less weight gain and may improve insulin sensitivity compared to other sulfonylureas. These findings are significant enough to warrant further investigation. The frequency of severe hypoglycemia in patients with type 2 diabetes treated with glimepiride versus glibenclamide (a European formulation) was compared in a population-based study from 1997 to 1999 in an area with 200,000 inhabitants. The present study supported the use of glimepiride alone (15.90%).[16]

Metformin does not promote weight gain and has beneficial effects on several cardiovascular risk factors. Accordingly, metformin is reported to be regarded as the first drug of choice for most patients with Type-II Diabetes.[17] Our study also supported that 13.07% of patients studied received metformin alone. At present, glibenclamide and glimepiride are the second-generation sulphonylureas most widely used in USA.[18]

In this study, among the second-generation sulphonylureas, glimepiride and biguanide, metformin combination was found to be the most commonly prescribed. Several studies showed that glimepiride/metformin fixed-dose combination therapy was more effective in glycemic control.[19] In connection to Glimepiride and metformin combination trial was registered with ClinicalTrial.gov (no. NCT00612144).[20] Coronary heart disease (CHD) is one of the major causes of death in elderly diabetic patients.[21] In our study, Table-3 showed presence of hypertension and other cardio vascular diseases (61.00%). The combination of Glimepiride, Metformin and DPP-IV inhibitors (11.82%) are non-affordable to the common people due to its high cost.[15]

To conclude, Glimepiride and metformin combination drugs were the most commonly prescribed antidiabetics. A combination of two or more drugs of different classes was prescribed to chronic condition of diabetics as well as hypertensive diabetics. Since the scope of the present study is limited as the number of patients studied is less, extensive studies are required to confirm our findings.

From the data collected, it was observed that among the antidiabetic drug category, drugs were found to be prescribed in following order; glimepiride-metformin combination >glimepiride >metformin >glimepiride-metformin-Dipeptidyl peptidase (DPP)-IV inhibitors combination >combination of glimepiride-metformin-pioglitazone >glimepiride-acarbose-pioglitazone combination. Among the sulfonylurea category, prescription was found to be maximum for glimepiride followed by glipizide. Among the biguanide category the only drug prescribed was metformin. Among glitazone category the only drug prescribed was pioglitazone.

Table-1: Age And Sex Distribution of Diabetic Patients

Sl.No.	Age group (years)	Women	Men	Total
1.	01-20	4	6	10
2.	21-30	27	53	80
3.	31-40	54	96	150
4.	41-50	80	110	190
5.	51-60	70	130	200
6.	61-70	65	105	170
7.	71-80	40	30	70
8.	81 and above	4	6	10
Total		344	536	880
%		39.09	60.91	100

Table-2: Percentage of Drugs Prescribed

Sl. No	Name of the Drug	No.of Patients on Drugs Concerned	Percentage of total oral hypoglycemic drugs prescribed
1.	Glimepiride	140	15.90
2.	Metformin	115	13.07
3.	Glimepiride-Metformin Combination	360	40.91
4.	Glimepiride-Metformin-Pioglitazone Combination	88	10.00
5.	Glimepiride-Acarbose-Pioglitazone Combination	73	08.30
6.	Glimepiride-Metformin-DPP4I Combination	104	11.82
Total		880	100

Table-3: Description of Drugs Present in Each Prescription

Column	1	2	3	4
No. of Prescriptions containing single Oral Hypoglycemic agent		No. of Prescriptions containing 2 or more oral Hypoglycemic agents	No. of Prescriptions of Column-2 with Antihypertensive drugs	No. of Prescriptions of Column-2 with Other Drugs
Total	228	652	398	254
Percentage	25.90	74.10	61.00	39.00

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