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Assessment of the prescription pattern of anti-diabetic drugs in type-2 diabetes mellitus patients

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Abstract

Background: India has a sizeable Diabetic Population with more than 72 million type-2 diabetic patients. Glycemic control remains the major goal for prevention of complications arising from diabetes. Poor glycemic control can be prevented by using rational & safe use of anti-diabetic drugs. The study of the prescription pattern can be used to evaluate the Rational use of the drugs in diabetic patients.

Methodology: A cross-sectional questionnaire-based study was carried out in 160 Diabetic patients attending diabetic OPD of a public tertiary care hospital to assess their prescribing pattern of anti-diabetic drugs.

Results: Out of 160 patients 56 were males (35%) & 104 were females (65%). Oral anti-diabetic drugs were prescribed for 128(80%) patients & 58 patients (36.25%) received insulin. Metformin was the most frequently prescribed drug to 125 patients (78.125%) followed by sulfonylurea to 73 Patients (45.625%) & DPP-4 inhibitors to 24 patients (15%). 104 patients (65%) were on combination therapy of 2 or more drugs and 56 Patients (35%) were on monotherapy. The Combination of Glimipride & Metformin was the most commonly prescribed drug combination to 49 patients (30.625%).

Conclusion: Oral anti-diabetic drugs are on top in prescribing pattern, but the use of insulin preparations in the treatment of Type 2 diabetes mellitus is increasing continuously

Keywords: Glycemic control; oral Anti-diabetic drugs; prescribing pattern

1. Introduction

A total of 422 million diabetic patients are present worldwide. The number will double by 2030 [1]. Type 2 diabetes makes up about 85-90% of all cases. Diabetes mellitus occurs throughout the world but is more common (especially type 2) in the more developed countries [2]. According to experts, 1 in 12 people in India is affected by diabetes & there were over 72 million cases of diabetes in India in 2017 which is more than entire U.K population [3]. These estimated data predict that it is a major concern in relation to the significant burden that diabetes imposes on our country.

Glycemic control remains the major goal for prevention of complications arising from diabetes. Poor glycemic control can be prevented by using rational & safe use of anti-diabetic drugs [4]. Currently used anti-diabetic medications are effective, however Poor Patient compliance, Insulin resistance & western lifestyle leads to poor glycemic control. The drug utilization studies or prescription pattern studies are important for the rational use of medicines [5]. Therefore, the present study was designed to assess the prescription pattern of standard anti-diabetic drugs in a diabetic OPD of a tertiary care government- run Hospital.

2. Methodology

2.1. Study design & setting

This was a cross-sectional questionnaire based study conducted in a Public tertiary care hospital of Delhi. The data were collected from August 2017 to January 2018.

2.2. Eligibility criteria

All Diagnosed cases of either sex of Type -2 DM above age 18 with at least 3 months period since diagnosis were included in the study. Patients with Type -1 DM & Moribund patients (seriously ill, comatose patients) were excluded.

2.3. Sampling size & procedures

Ethical clearance was obtained from IEC/IRB. The Identity of the hospital is not being disclosed to maintain the Confidentiality of Information.

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The Information was collected from Diabetic patients after taking their consent during the OPD visiting hours.

2.4. Sample size

A total of 160 type-2 diabetic patients were interviewed. A non-probability convenience sampling procedure was used to collect information.

2.5. Data collection tool

An Instructor Administered questionnaire for assessing prescription pattern was administered to patients which Collected information on the following: Socio-demographic characteristics (Name, Age, Sex, Height, Weight, BMI, Occupation), clinical history (HbA1C,fasting glucose level, post-prandial glucose level(mg/dl),blood pressure, pulse rate, smoking (Yes/No), alcohol (Yes/No), Family History of (T2DM, hypertension, stroke, heart disease) (Yes/No), Exercise (Yes/No), walking (Yes/No). Medication prescribed.

2.6. Data analysis

Data analysis was performed using MS-office excel software Continuous variables were reported as means ± standard deviation. Categorical variables were reported as proportions (%).

3. Results

3.1 General characteristics

A Total of 160 Type-2 DM patients were enrolled in the Study. The Male to Female ratio was found to be 7:13. The average age of the patients was 51.8125±11.18 & one third of the study group was aged > 60 yrs. The average BMI was found to be 23.12±4.61kg/m².All the general characteristics are given in Table 1.

Table 1: General characteristics

Variable	Category	Frequency%
Gender	Male	56(35%)
	Female	104(65%)
Age groups	20-40	16(10)
	40-50	51(31.875)
	50-60	38(23.75)
	60-70	48(30)
	>70	7(4.375)
BMI(kg/m ²)	Underweight	28(17.5)
	Normal	78(48.75)
	Overweight	39(24.375)
	Obese	15(9.375)
Employment Status	Earning	70(43.75)
	Dependent	90(56.25)

3.2 Clinical history

Out of 160 patients, 90(56.25%) had a history of hypertension. 89 patients had CAD(55.62%) & 6 patients

(3.75%) of Hypothyroidism was found. Out of the total sample 27 patients(16.87%) were smokers 14(8.75%) patients were alcohol drinkers.50 patients(31.25%) had a family history of diabetes/stroke/hypertension/kidney disease.26 patients(16.25%) were regularly doing exercise/running/yoga/cardio while 119(74.375%) patients were regularly on walking.The other clinical parameters of patients and their mean value are given in table 2.

Table 2: Clinical Parameters

Parameter	Average value
Systolic B.P.	141.47±31.65
Diastolic B.P	87.73± 15.88
HbA1C	8.46±1.8
Fasting glucose(mg/dl)	156.64±57.76
Postprandial glucose	251.29±90.09

3.3. Medication prescribed

Oral anti-diabetic drugs were prescribed for 128(80%) patients & 58(36.25%) patients received insulin. Metformin was the most frequently prescribed drug to 125 patients (78.125%) followed by sulfonylurea to 73 Patients (45.625%) & DPP-4 inhibitors to 24 patients(15%). 104 patients(65%) were on combination therapy of 2 or more drugs and 56 Patients(35%) were on monotherapy. The Combination of Glimipride & Metformin was the most commonly prescribed drug combination to 49 patients (30.625%).

Table 3: Distribution of the Diabetic patients according to Drug Prescription pattern

Drugs	No. of Patients (n=160)	Percentage (%)
Monotherapy	56	35%
2 Drug combination	79	49.375%
3 Drug combination	25	15.625%

Table 4: Prescription pattern of anti-diabetic drug therapy (Monotherapy)

Drugs	No. of Patients (n=56)	Percentage (%)
Insulin	32	20%
Metformin	22	13.75%
Glimipride	2	1.25%

Table 5: Prescription pattern of Anti-diabetic drug therapy (Two Drug Combination)

Drugs	No. of Patients (n=79)	Percentage (%)
Metformin+ sulfonylurea	49	30.625%
Metformin+ Insulin	17	10.625%
Metformin+DPP4 inhibitors	10	6.25%
Metformin+Voglibose	2	1.625%
Sulfonylurea + Insulin	1	0.625%

Table 6: Prescription pattern of anti-diabetic drug therapy (Three Drug Combination)

Drugs	No. of Patients (n=25)	Percentage (%)
Metformin+Sulfonylurea +DPP-4 Inhibitor	10	6.25 %
Metformin+Sulfonylurea + Voglibose	5	3.125%
Metformin+Sulfonylurea + Insulin	5	3.125%
Metformin+DPP-4 + Insulin	3	1.875%
Metformin+DPP-4 + Voglibose	1	0.625%
Metformin+Sulfonylurea + pioglitazone	1	0.625%

4. Discussion

Diabetes mellitus is a chronic disorder & is the 7th leading cause of death worldwide. Its prevalence is continuously increasing in developed & developing countries & it requires a lifelong treatment. In the early stage of Diabetes the glycemic control can be achieved by lifestyle modification but in some cases it is difficult to avoid anti-diabetic drugs. However, Poor patient compliance & clinical inertia lead to uncontrolled glycemia A drug utilization study is the most effective method to assess and to evaluate the prescribing attitude of a physician and helps to promote the rational use of drugs.

This study analyzed the Prescription pattern in Type-2 diabetic patients who visited the diabetic OPD of a Government- run tertiary care Hospital of Delhi. This Cross-sectional study involved 160 prescriptions of patients with Type 2 DM. The Male to female ratio was found to be 7:13 i.e. The occurrence of Type-2 DM is more in females as compared to males. It may be due to the fact that men have to gain less weight than women to develop diabetes.

The study found a higher incidence of diabetes among elderly patients.

(Table.1).

Metformin is the most prescribed drug because it reduces the Cardiovascular Risks. Metformin & Glimipride was the Most prescribed Drug Combination because it controls the Hyperglycemia effectively.

This suggests that sulfonylureas and Metformin are the choices of most physicians in the treatment of Type 2 DM. There was also a higher prescribing percentage of insulin therapy, Insulin preparations help in decreasing the insulin resistance effectively hence lead to better Glycemic control

[6, 7, 8].

5. Conclusions

Oral anti-diabetic drugs are on top with Metformin is the drug of choice in prescribing pattern, but the use of insulin preparations in the treatment of Type 2 DM is increasing continuously. To maintain the clinical standard of prescribing, a constant effort is mandatory for every physician to follow the guidelines recommended by various International bodies. The study was done for a short period of time and the number of patients was less. Hence similar studies should be conducted on a large number of patients to confirm this study.

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