Research Article
AMERICAN JOURNAL OF PHARMACY AND HEALTH RESEARCH
www.ajphr.com
2017, Volume 5, Issue 11
ISSN: 2321–3647(online)

A Study on Prescribing Pattern of Antidiabetic Drugs in Type-2 Diabetic Patients In A Tertiary Care Teaching Hospital

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ABSTRACT

Prescribing pattern monitoring studies are a tool for assessing the prescribing, dispensing and distribution of medicines. The main aim of this study is to facilitate rational use of medicines. Diabetes is a metabolic disorder characterized by the existence of hyperglycaemia due to malfunctioning insulin secretion, insulin action or both. The main aim of this study is to study the prescribing pattern of anti-diabetic drugs in a Type-II diabetes mellitus in a tertiary care teaching hospital. This Prospective observational study performed for a period of 6 months in general medicine department Rajiv Gandhi Institute of Medical sciences. A total 320(100%) patients were recruited under inclusion criteria upon taking of ICF based on inclusion and exclusion criteria. In this study we found a higher incidence in age group of 45-65 years. Mean age of patients came out to be 57.36 ± 8.80 years. Average number of drugs per prescription was 3.99 because of polypharmacy practice in diabetic patients. Biguanides and Sulfonylureas are the most commonly prescribed antidiabetic drugs that were in line with other studies. Among biguanides metformin was most commonly prescribed drug. Maintaining better glycemic control is a therapeutic goal for Type 2 DM patients, which can reduce the frequency of complications and thereby improves quality of life. A strong conclusion of this study highlights the necessity for patient education and counselling on usage of antidiabetic and associated drugs, regular checkups of blood glucose and glycosylated haemoglobin (HbA1c) levels, dietary changes with low calorie food, and rectification of diabetic problems.

Keywords: Prescribing pattern, diabetes mellitus, rational use of drugs, better patient care.

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Received 29 September 2017, Accepted 16 October 2017

Please cite this article as: Reshma SK *et al.*, A Study on Prescribing Pattern of Antidiabetic Drugs in Type-2 Diabetic Patients In A Tertiary Care Teaching Hospitaly. American Journal of Pharmacy & Health Research 2017.

INTRODUCTION

Drug utilization evaluation is an ongoing, systematic, quality improvement process which is designed to review the prescribing pattern of drugs and to provide rational drug therapy. Diabetes is a metabolic disorder characterized by the existence of hyperglycaemia due to malfunctioning insulin secretion, insulin action or both. The chronic hyperglycaemia of DM is coupled with considerable long-term sequel, predominantly injure, dysfunction and failure of a variety of organs-especially kidneys, eyes, nerves, heart and blood vessels.[1,2,3] It is a state of epidemically increasing problem in India with greater than 62 million diabetic persons currently diagnosed with the disorder.[4,5,6] The statistical report in the year 2000 accurately reported that India (31.7 million) topped the world with the maximum number of people with diabetes mellitus followed by China (20.8 million) with the United States (17.7 million) in second and third place correspondingly. According to Wild et al.[7] the occurrence of diabetes is predicted to be twice globally from 171 million in 2000 to 366 million in 2030 with a highest increase in India. It is predicted that by 2030 diabetes mellitus may badly affect up to 79.4 million individuals in India, while China (42.3 million) and the United States (30.3 million), a large increase will be seen in all affected areas by the disorder.[8,9,10] Obese individuals represent the bulk of the diabetic population and 60-90% of the Type 2 diabetic people. Patients with Type 2 diabetes include defects in insulin secretion, tissue sensitivity to insulin, and hepatic glucose production.[11,12,13] Obesity is correlated with higher possibility for numerous serious health conditions, such as hypertension, Type 2 diabetes, hypercholesterolemia, coronary heart disease (CHD), stroke, asthma, and arthritis. Direct check-up expenditure on diagnosis and management of these conditions, therefore, is possible to raise with increasing obesity levels.[14, 15] Poor Glycemic management in diabetes mellitus can occasionally prohibited by rational use of oral Hypoglycemic Agents (OHAs) and insulin [16,17]. Rational exercise of the drugs is a defined as follows: "That patients receive treatment appropriate to their clinical requirements, in doses that meet their own individual needs for an sufficient period of time and at the least cost to them and their area" [18]. Rational use of the drugs in populations can be effectively evaluated with drug utilization studies. The World Health Organization (WHO) defines "drug utilization" as the marketing, distribution, prescription and use of the drugs in a society considering its medical, social, and economic consequences [19, 20].

Aim of the study:

To study the prescribing pattern of anti-diabetic drugs in a Type-II diabetes mellitus in a tertiary care teaching hospital.

MATERIALS AND METHOD

This Prospective observational study performed for a period of 6 months in general medicine department Rajiv Gandhi Institute of Medical sciences, a south Indian tertiary care teaching Government hospital Kadapa. This study got ethical approval from the IEC of RIMS, Kadapa and bearing (RIMS/IRB/2016/006). A total 320 study populations was taken and patients were enrolled based on inclusion and exclusion criteria by using study materials like patient data collection proforma, informed consent form in hospital. Both males and females of age group between 20 to 80 years diagnosed as Type 2 diabetes mellitus, Informed consent form was signed and received from individual patients & they were further inquired for additional information of other comorbidities. The filling of the prescriptions were assessed and brand names were interpret to generic names with standard CIMS India and internet. Treatment of diabetic patients at the hospital during the study period of six months were evaluated for prescribing patterns of antidiabetic drugs in this study. The patients were evaluated for social, demographical and clinical variables and medications.

RESULTS AND DISCUSSION:

A total 320(100%) patients were recruited under inclusion criteria upon taking of ICF. Out of 320 patient's 180(56.25%) as majority of patients were males and 140(43.75%) were females and these are represented in following below table-1, figure 1.

Table 1: Patient distribution based on gender

S.No	Gender	No. of Patients	Total
1.	Male	180(56.25%)	n= 320(100%)
2.	Female	140(43.75%)	

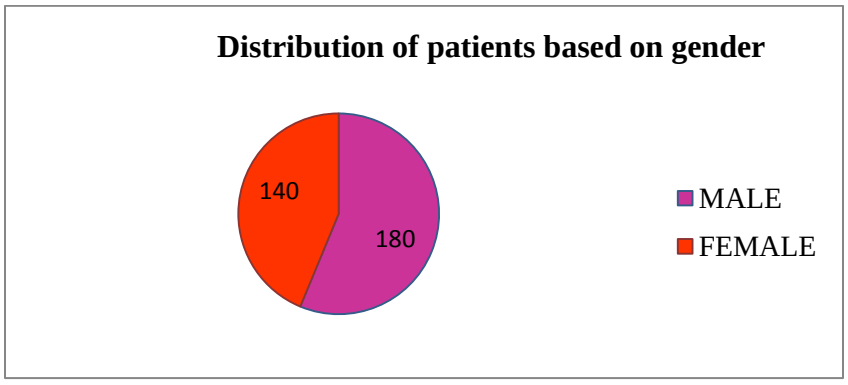

Figure 1: Distribution of patients based on gender.

Out of 320 (100%) patient's majority i.e. 128(40%) between the age group of 45-65 years, 96(30%) in between 61-80 years, 66(20.62%) in between 20-40 years and very less 30(9.37%) in between age group of above 80 years, which are represented in following below table:

Table 2: Patients distribution based on Age

S. no	Age (in years)	No. of Patients	Total
1.	20-40	66 (20.62%)	
2.	45-65	128 (40%)	n=320 (100%)
3.	61-80	96 (30%)	
4.	>80	30 (9.37%)	

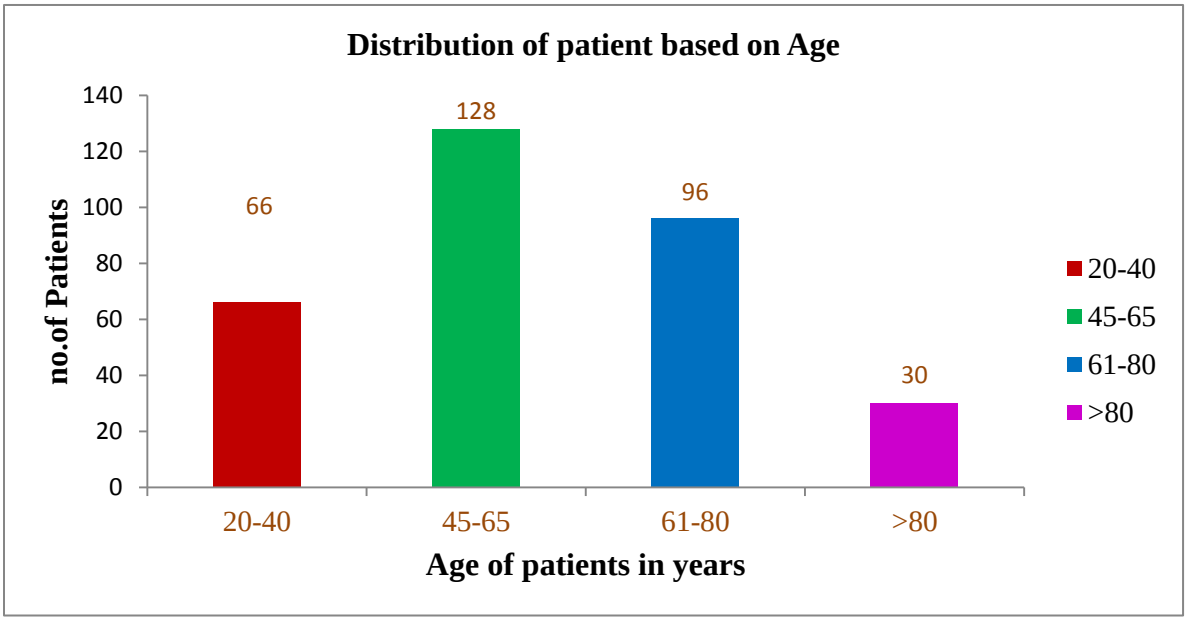

Figure 2: shows patient distribution based on age

Out of 320 patient's majority i.e. 136(52.5%) patients were have 06-10 years disease history, 129(49.68%) patients with 11-15years, 25(24.2%) patients with 0-5 years, 18(20%) patients with16-20 years and 12(20%) patients with >20years based on duration of disease history, which was represented in following below table- 3, figure 3.

Table 3: Patient distribution based on Disease History.

S.No	No. of years of disease history	Total
1.	0 -05 years	25(7.81%)
2.	06-10 years	136(41.25%)
3.	11-15 years	129(40.31%)
4.	16-20 years	18(5.62%)
5.	>20 years	12(3.75%)
		n = 320 (100%)

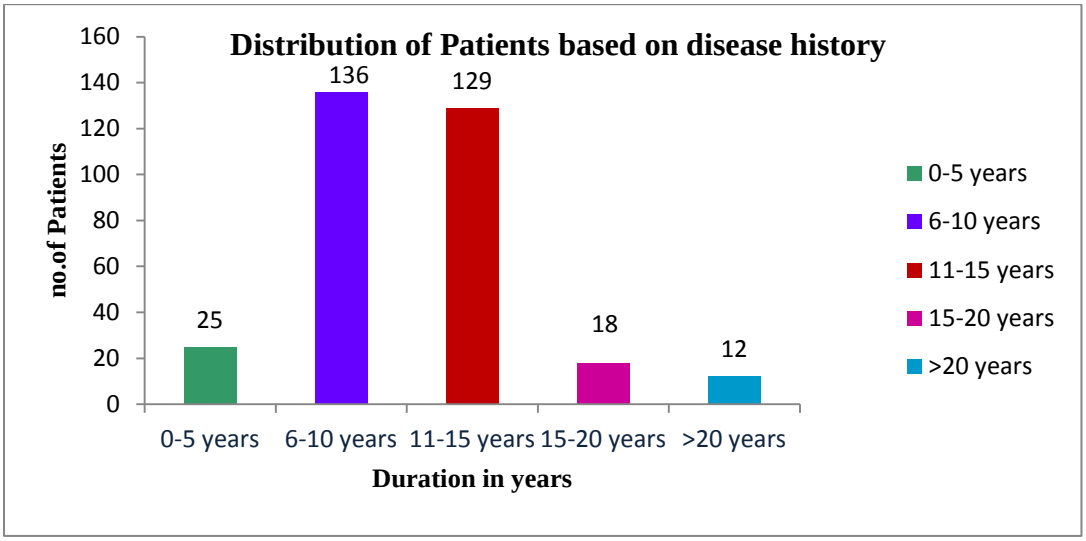

Figure 3: Distribution of patients based on disease history

Out of 320 patient's majority i.e. 240 patients were have Monotherapy, 60 patients were on two drugs combination and 20 patients were on three drugs combination. which was represented in following below table-4

Table 4: Distribution of the patients based on the utilization pattern.

Drugs	No. of Patients(n= 320)	Percentage (%)
Monotherapy	240	75
Two drugs combination	60	18.75
Three drugs combination	20	6.25

Among 240 patients of Monotherapy majority of 135(56.25%) patients were have metformin, 92(38.33%) patients have glimepiride, 6(2.5%) patients were have Glibenclamide, 1(0.41%) patient have gliclazide i.e. very least, 2(0.83%) patients were have glipizide and 4(1.66%) patients were have pioglitazone.

Table 5: The antidiabetic drugs utilization pattern (Monotherapy)

Drugs	No. of Patients(n= 240)	Percentage (%)
Metformin	135	56.25
Glimepiride	92	38.33
Glibenclamide	6	2.5
Gliclazide	1	0.41
Glipizide	2	0.83
Pioglitazone	4	1.66

Among 60 patients of Two drugs combination majority of 50 patients were have Metformin+Glimepride,6 patients have Metformin+Glibenclamide,2 patients were have Metformin+Gliclazide, and each of 1 patient have Metformin+Gliclazide, Metformin + voglibose.

Table 6: The antidiabetic drugs utilization pattern (Two drugs combination)

Drugs	No. of Patients(n= 60)	Percentage (%)
Metformin+Glimepride	50	83.33
Metformin+Glibenclamide	6	10
Metformin Pioglitazone	1	1.66
Metformin + voglibose	1	1.66
Metformin+Gliclazide	2	3.33

Among 20 patients of Three drugs combination less of 12 patients were have Metformin+ Glimepride+Pioglitazone and majority of 8 patients have Metformin + Glimepride + sitagliptin

Table 7: The antidiabetic drugs utilization pattern (Three drugs combination)

Drugs	No. of Patients(n= 20)	Percentage (%)
Metformin+ glimepiride +Pioglitazone	12	60
Metformin + Glimepride + sitagliptin	8	40

DISCUSSION:

In this study we found a higher incidence in age group of 45-65 years. Mean age of patients came out to be 57.36 ± 8.80 years while it was 56.9 ± 12.55 years in an isolated study and 60.5 ±12.8 years in another study. Average number of drugs per prescription was 3.99 because of polypharmacy practice in diabetic patients.

Biguanides and Sulfonylureas are the most commonly prescribed antidiabetic drugs that were in line with other studies. Among biguanides metformin was most commonly prescribed drug. This finding was in contrast to other investigators who found glimepiride to be most commonly prescribed medication. Mean age of patients in this study was on higher side i.e. 53.36±8.90 years this may be one of the reasons of commonly prescribing metformin because with sulphonyl ureas high risk of hypoglycaemia in elderly. Among combination therapy sulfonylureas and metformin was most commonly prescribed in this study like in other studies also followed of glimepride, pioglitazone, and metformin therapy. Pioglitazone alone was also prescribed to a number of prescriptions, few prescriptions contained sitagliptine and acarbose. Duration of diabetes plays an important role in patients with long term complications. Tight glycemic control results in lesser incidence of complications but complications like retinopathy, neuropathy, nephropathy, micro and macro vascular complications is related to duration of diabetes and not its severity. In our study majority of prescriptions had diabetic duration of <5 years same finding was also concluded by Upadhyay et al [21].

CONCLUSION:

Diabetes mellitus is potentially epidemic in India. The level of morbidity and mortality due to

diabetes and its potential complications are huge, and create major healthcare burden on both families and society. Maintaining better glycemic control is a therapeutic goal for Type 2 DM patients, which can reduce the frequency of complications and thereby improves quality of life. The current study described that type 2 diabetes was more prevalent in males than in females. The study found that metformin was the mostly prescribed oral antidiabetic drug both as monotherapy as well as combination therapy. Overall, monotherapy was found to be leading over combination therapy. The most commonly used drug class was biguanides there by sulfonylureas. Metformin with sulphonyl ureas was the most habitually prescribed combination therapy. This study stated that pattern of antidiabetic prescription was rational and principally act in accordance with NICE (National Institute for Health and Clinical Excellence) guidelines. A strong conclusion of this study highlights the necessity for patient education and counselling on usage of antidiabetic and associated drugs, regular checkups of blood glucose and glycosylated haemoglobin (HbA1c) levels, dietary changes with low calorie food, and rectification of diabetic problems. To maintain the clinical standard of prescribing, a continuous attempt is compulsory for each general practitioner to follow the guidelines suggested by a variety of International bodies.

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