

**ASSESSMENT OF INPATIENTS PRESCRIBING PATTERN OF ORAL ANTI DIABETIC DRUGS IN CENTURY HOSPITAL KERALA**Vidhya Krishna<sup>1\*</sup>, Shema Joseph, A. Srinivasan and Dr. D. Krisnarajan

Department of Pharmacy Practice; JKKMMRF College of Pharmacy, Komarapalayam, Tamilnadu.

**\*Corresponding Author: Vidhya Krishna**

Department of Pharmacy Practice; JKKMMRF College of Pharmacy, Komarapalayam, Tamilnadu.

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**ABSTRACT**

The main objective of the study is to analyze the prescribing patterns in type 2 diabetic patients on oral antidiabetic agents and to assess the awareness of patients about diabetes, its medication and lifestyle modification. A prospective study was carried out over a period of eleven months in general medicine department of diabetology century hospital kerala. The type 2 diabetic in-patients who were on oral hypoglycemic were enrolled in the study. A suitable data collection form was prepared and used to collect the required data. The demographic data, disease data and the utilization of various oral antidiabetic agents were analyzed and the knowledge of the patients was assessed by using a Michigan questionnaire. About 250 patients were recruited for the study. Among the study population 64.5% (155) were males. The majority of patients (69.6%) were in the age group of 41-60 years. About 54.16% of the patients have a history of diabetes less than 5 years. Metformin and Glimepride was the most common drug used among the various oral antidiabetics prescribed. The present study found that majority of patients has knowledge about the disease, medication and lifestyle modifications. The present study shows that type 2 diabetes was prevalent more in males than females. The elderly patients were at high risk of developing type 2 diabetes. Metformin and Glimipride was the most common drug used among the various oral antidiabetics prescribed.

**KEYWORDS:** Diabetes, Oral antidiabetic agents, prescribing patterns, Metformin, knowledge.**INTRODUCTION**

India has one of the largest populations of diabetes in the world. The international diabetes federation (IDF) estimates the number of people with diabetes in India will reach 80 million by the year 2025. A survey depicts that 4% of adults in India suffered from diabetes in the year 2000 and is expected to increase to 6% by the year 2025. The world health organization (WHO) has projected that the global prevalence of type 2 diabetes mellitus will more than double from 5 million in 1995 to 300 million by 2025. Between 1995 and 2025, there will be a 35% increase in worldwide prevalence of diabetes mellitus, from 4 to 5.4%.<sup>[1,2]</sup>

Diabetes mellitus (DM) is a group of metabolic disorders characterized by hyperglycemia; is associated with abnormalities in carbohydrate, fat and protein metabolism; and results in chronic complications including microvascular, macrovascular, and neuropathic disorders. When the amount of glucose in the blood increases, e.g., after a meal, it triggers the release of the hormone insulin from the pancreas.<sup>[3,4]</sup>

The major causes of type 2 diabetes are as follows.

**• GENETICS**

Genetic factors are more important in the etiology of type 2 diabetes than in type 1 diabetes. The majority of type 2 diabetes is multi factorial. In this polygenic model, inheritance of variation in individual genes would not be sufficient to cause type 1 diabetes directly, but would confer an increased susceptibility.

**• ENVIRONMENTAL FACTORS****a. Lifestyle**

Epidemiological studies of type 2 diabetes provide evidence that over eating, especially when combined with obesity is associated with the development of type 2 diabetes.

Obesity probably acts as a diabetogenic factor in those who genetically disposed to develop type 2 diabetes.

**b. Age**

Age is an important risk factor for type 2 diabetes. It is principally a disease of middle aged and elderly, affecting 10% of the population over the age of 65.

**c. Pregnancy**

During normal pregnancy insulin sensitivity is reduced through the action of placental hormones and this affects glucose tolerance. The insulin secreting cells of

the pancreatic islets may be unable to meet this increased demand in women genetically predisposed to develop diabetes. Repeated pregnancy may increase the likelihood of developing irreversible diabetes, particularly in obese women.

Many patients with type 2 diabetes are asymptomatic, and their disease is undiagnosed for many years. Studies suggest that the typical patient with new-onset type 2 diabetes has diabetes for at least 4-7 years before it is diagnosed. Among patients with type 2 diabetes, 25% are believed to have retinopathy; 9% neuropathy; and 8% nephropathy at the time of diagnosis. Type 2 diabetes is a chronic medical condition that requires regular monitoring and treatment. Treatment, which includes lifestyle adjustments, self-care measures, and sometimes medications, can control blood sugar levels in the near-normal range and minimize the risk of diabetes-related complication.<sup>[4,5]</sup>

## MANAGEMENT OF TYPE II DIABETES MELLITUS

□ **Increase insulin sensitivity:** Early in the disease process, the aim should be to target insulin resistance with diet and exercise plus metformin therapy. A weight loss of 5 kg leads to a 25%-50% reduction in insulin resistance. Metformin is tolerated by most patients if started at a low dose (e.g. 250-500 mg/kg), which is slowly increased depending on blood sugar response and tolerance.

The Thiazolidinediones (Pioglitazone) are newer insulin-sensitizing agents which are effective, but have the disadvantage of causing some weight gain and fluid retention.

- **Increase circulating insulin:** If strategies to increase insulin sensitivity are ineffective, the next step is to increase circulating insulin level. It is done by the use of oral hypoglycemic agents. Metformin should be continued if the patient is obese.<sup>[7,8]</sup>

### Oral Hypoglycemic agents

Blood glucose levels are mainly determined by absorption of glucose from gut, uptake of glucose by peripheral tissues, hepatic glucose output and insulin secretion from pancreas. Various oral antidiabetic agents act by modifying the factors aiding in the control of hyperglycemia. The treatment of diabetes can be done with conventional oral hypoglycemic agents.<sup>[9,10]</sup>

## MATERIALS AND METHODS

The study was conducted at inpatient medicine department of diabetology of century hospital, Mulakuzha, Kerala which is a multi specialty tertiary care teaching hospital with 750 bed strength. It provides health care facilities to people in and around

Alappuzha District. This study was carried out for a period of 11 months; August 2016-july 2017 With the sample size of 250 patients hospitalized with Diabetes qualifying the study criteria.

### Data Analysis

In order to assess the drug usage pattern in type 2 diabetic patients, all the data collected from the prescriptions were subjected to analysis. Patients were grouped gender wise into male and female and their respective percentage proportion was calculated. Patient's age was sub classified into different age groups with a difference of 10 years. The duration of the disease and the family history of the patients were calculated in percentage. For further analysis the prescribed medications used for the management of type 2 diabetes were classified and their percentage proportion was calculated. The drugs used were categorized as single and combination therapy.

### Inclusion criteria

- Inpatients (both sexes) in medicine wards who were on oral antidiabetic drugs.
- Those patients with a history of previously using oral antidiabetic drugs.
- Age 20 years and above.

### Exclusion Criteria

- Patients of type-1 diabetes and juvenile diabetes.
- Inpatients of other specialties.
- Patients enrolled in clinical trials or on treatment with any investigational drug(s).
- Incomplete medical records.

The data included demographic details, drug use pattern, diabetic complications and family history of hospitalized diabetic patients and the informations were collected from the patients treatment charts, discharge summary, hospital pharmacy data base and medical records department. All the collected data were documented in the suitably designed data collection form.

## RESULT AND DISCUSSION

### Demographic data of patients

#### Gender distribution of the patients

Table 1 shows Out of 250 patients enrolled in the study, 155 (64.5%) were male patients and 95 (39.5%) were female patients.

TABLE -1:

Gender	No. of Patients n=250	Percentage (%)
Male	155	64.5
Female	95	39.5

#### Age distribution of patients

Table 2 shows Among the study population, 174 (69.6%) were from the age group 41-60 years followed by 61 (24.4%) from the age group 61-80, 10(4%) from

age group 20-40years and 5 (2%) belongs above 80 years.

**TABLE -2:**

Age Range (yrs)	No. of patients n= 250	Percentage (%)
20 - 40	10	4
41 – 60	174	69.6
61 – 80	61	24.4
Above 80	5	2

### Family history of patients

#### Family History of Patients suffering from diabetes

**TABLE -3.**

Diabetes among family members	No. of Patients n= 250	Percentage (%)
Father	58	23.2
Mother	26	10.4
Both Father & Mother	30	12
Other Family Members	46	18.4
No Family Member	90	36

### Diabetes history of patient

Table 4 shows Among the study population 130 (54.16%) patients had a diabetic history of less than 5

Table 3 shows Among the study population, 58 (23.2%) had their father alone suffering from diabetes, 26 (10.4%) patients had their mother alone suffering from diabetes, 30 (12%) patients had both their father and mother suffering from diabetes, 46(18.4%) patients had their other family member suffering from diabetes and 90 (36%) patients had no family members with diabetes.

years, followed by 11-15 years in 60 (24%) patients, 6-10 years in 28 (11.2%) patients, 16-20 years in 25 (10%) patients and more than 20 years in 7 (2.8%) patients.

**TABLE 4.**

Diabetes history interval (years)	No. of patients n=250	Percentage (%)
0-5	130	54.16
6-10	28	11.2
11-15	60	24
16-20	25	10
Above 20	7	2.8

### Co morbidities of diabetes

Table 5 shows Total of 140 (56%) patients among the study population had associated Hypertension, 36 (14%) patients had Dyslipidemia, 5 (2%) patients had CCF, and Hepatomegaly was present in 9 (3.6%) patients. 60 (24%) patients doesn't had any co morbidities.

**TABLE -5.**

Co morbidities	No. of patients n = 250	Percentage (%)
Hypertension	140	56
Dyslipidemia	36	14
CCF	5	2
Hepatomegaly	9	3.6
None	60	24

### Therapeutic approach for management of type 2 diabetes

Table 6 shows Out of 250 patients enrolled in the study, 206(82.4%) patients were managed with Monotherapy, diabetes of 40(16%) patients was controlled with Dual therapy and 4 (1.6%) patients were managed with Triple therapy.

### Therapeutic approach for the management of type 2 diabetes

**TABLE -6.**

Therapy	No. of Patients n = 250	Percentage (%)
Monotherapy	206	82.4
Dual therapy	40	16
Triple therapy	4	1.6

### Pattsern of Oral antidiabetic drugs prescribed

Among the various OHAs prescribed 43.8% of drugs were found to be Metformin, 7.3% and 13.9% drug prescribed were Glibenclamide and Glimepride. Glipizide were 2.9%, and 5.1% of drugs was Pioglitazone. 7.33% of combination of Glibenclamide and Metformin were prescribed among the patients, 10.9% and 1.5% of drugs were the combination of Metformin and Glimepride and combination of Metformin and Pioglitazone. 1.5% of drugs were prescribed with combination of Metformin, Glimepride and Pioglitazone.

Out of 250 prescriptions of antidiabetic drugs studied, 64.5% were men and 39.5% were women, indicating the men predominated over women. The study found a

higher incidence of diabetes was among elderly patients, with a high incidence in the age group of 41- 60 years (69.6% of the total) followed by age group 61-80 years (24.4% of the total).

The duration of diabetes is an important factor in diabetes management. In patients with a long duration of diabetes, tight glycaemic control results in a lesser incidence of complications. In the present study, it was found that greater number of patients (54.16%) have a diabetic history less than 5 years, followed by 24% of patients with a history of 11-15 years. This result is in accordance with the previous studies done in different countries.

#### Patient awareness to the disease

Patient awareness to the disease was carried out by Michigan questionnaire form. Out of 219 patients responded to the questionnaire 208 (95.2%) patients knew about diabetes. About 186 (84.8%) patients have the knowledge regarding the symptoms of the disease. Total of 177 (81%) patients answered the different diabetic complications and 20(19.0%) did not responded to the question. The drug therapy for diabetes was known to 76 (72.4%) patients and they knew how to administer the medicines (before or after meals). About 85 (81%) of the respondent miss their dose of medicines, whereas 20 (9.0%) patients take their regular medications. Most of the patients have awareness about the exercise regimen and the dietary management. Total of 79% of patients have knowledge about hypoglycemic condition and 72.4% of patients are aware about its management.

#### CONCLUSION

The present study shows that type 2 diabetes was more prevalent in males than females. The elderly patients were at high risk of developing type 2 diabetes. A total of 190 patients had co morbid conditions along with diabetes and commonly seen co morbid condition in the study was Hypertension [140(56%)]. The study has shown Metformin as the predominantly prescribed oral antidiabetic drug both in monotherapy and in combination therapy. Overall, monotherapy was found to be predominant over combination therapy. There was no significant increase in the prescriptions of newer oral antidiabetic agents like  $\alpha$ -glucosidase inhibitors and DPP-4 inhibitors. It may be concluded that the incidence of polypharmacy is low and the essential drug prescription is high and therefore drug use is quiet rational. The present study also found that a good number of respondents had positive knowledge and attitude regarding diabetes, the same was not practiced by them. Improving patient knowledge on correct dosage will perhaps boost up the health care setting in the hospital. Thus this study strongly highlights the need for creating awareness in patients so that we can improve the patients condition. Out of 219 patients responded to the Michigan questionnaire 208 (95.2%) patients knew about diabetes. Total of 177 (81%) patients answered the different diabetic complications and 20(19.0%) did not

responded to the question. Most of the patients have awareness about the exercise regimen and the dietary management.

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