

Original Research Article

Prescription pattern of anti-diabetic drugs in a rural area of South Malabar region of Kerala, South India

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ABSTRACT

Background: Diabetes is a chronic metabolic disease associated with significant morbidity, mortality and cost to the community. This study was conducted to evaluate the prescription pattern of type 2 diabetes mellitus in a rural population scenario including different age groups and gender.

Methods: It was a prospective observational study carried out at Pulikkal village, Malappuram from January 2018 to June 2018. One hundred and four patients of Type II diabetes mellitus who confirmed to the specified inclusion and exclusion criteria were enrolled for the study after taking consent.

Results: This study shown that 62.5% of patients were on the age group of 41 to 60 and 96% of these patients were literate. This study shown that mono therapy was observed in 38.46% patients and combination therapy in 61.54% patients and metformin as the predominantly prescribed oral anti diabetic drug both in combination and monotherapy. In the sulfonylureas, glimepiride followed by glipizide were the prominently prescribed drugs. There is also a significant increase in the prescriptions of newer OHAs like thiazolidinedione's, alpha glucosidase inhibitors and DPP-4 inhibitors.

Conclusions: Metformin is the most prescribed anti-diabetic drug in monotherapy. In combination therapy, most frequently prescribed combination was the glimepiride and metformin and followed by metformin+glipizide and glibenclamide and metformin.

Keywords: Diabetes, Drug utilization, Metformin, Prescription pattern

INTRODUCTION

Diabetes mellitus was recognized as early in 1500 BC by Egyptian physician, who described a disease associated with "the passage of much urine".¹ It is a group of metabolic disorder of fat, carbohydrates and protein metabolism that result from defect in insulin secretion, insulin action (sensitivity), or both.² It's a one of the most common medical disorder affecting people of all ages, this disease cannot be cured, it can however, be managed and controlled through medication. Diabetes affects almost 40 million Indians and studies suggest one in every 12 Indians above the age above 40 may be diabetic.³

Diabetes is not a single disease rather than it is a heterogeneous group of syndrome characterized by an elevation of blood glucose caused by a relative or absolute deficiency of insulin.⁴ Numerous factors have been associated with the development of diabetes such as obesity, increase in age, heredity, endocrine disease, emotional stress, viral stress, drug such as cortisone, estrogen, thyroid, phenytoin, thiazide diuretics.⁵

Type-2 DM is much commoner than type-1 (approximately 75% D.M). it usually occurs in patient over the age of 40 years. Incidence of type-2 increase with age and with increasing obesity.⁶ It is more common in woman than in man in US, and varies widely among

various racial and ethnic population, being especially increased in some group of native Americans, Asian Americans, African Americans and pacific island people.² Concurrent illness such as hypertension in diabetics makes it more difficult to avoid multiple drug use; hence diabetics are more prone to polypharmacy and sometimes to irrational prescriptions.⁷ Diabetes mellitus is a chronic illness that requires continuing medical care and ongoing patient self-management education and support to prevent acute complications and to reduce the long-term complications.⁸

Drug utilization study of antidiabetic agents is of paramount importance to promote rational drug use in diabetics and make available valuable information for the healthcare team.⁹ There are many class of drugs that are used for the management of diabetes including insulin, oral hypoglycemic agents like biguanides, sulfonylurea, meglitinides, thiazolidinediones, alpha glucosidase inhibitors, DPP-4 inhibitors. The prescription of these medicines depends on patient's physical characteristics and physician's decision.

So, this study mainly aims to find out the prescription pattern of antidiabetic medication in South Malabar region of Kerala.¹⁰

METHODS

The prospective observational house hold study was carried out for a period of 6 months from January to June 2018 at Pulikkal village, Malappuram, Kerala. This village is situated 4 km away from Calicut airport. A total of 425 houses were covered and a total of 528 patients were screened, out of which 104 being a known case of type 2 DM under treatment of both genders and aged between 18 to 80 years were included in this study. In addition to type 2 DM patients, type 2 DM patients with associated comorbidities like hypertension, hypercholesterolemia, asthma, etc. were included in the study. Patients with type 1 diabetes mellitus, gestational diabetes, diabetic complications and serious medical conditions requiring subsequent hospital admissions were excluded from the study.

Door to door visits were made by our team members. A structured questionnaire was prepared and explained in a simple language. Patient's demographic data, detailed medical history, medications, questions regarding life style, diet pattern and exercise program, comorbid conditions, laboratory investigations were recorded in the study proforma. Confidentiality and anonymity of the patient's information will be maintained during and after the study. Written informed consent from all the participants were obtained.

Statistical analysis

The gathered data is expressed in the percentile form.

RESULTS

A total of 425 houses were covered and a total of 528 patients were screened, out of which 104 being a known case of type 2 DM were selected according to the study protocol. Totally 64 (62%) males and 40 (38%) females were participated (Figure 1). These patients were further categorized based on their age (Table 1); 9 patients (8.7%) belonged to the age group 22-40 years, 65 (62.5%) to the age group 41-60 years, 30 (28.8%) to the age group 61-80 years. In this study it was observed that 100 (96%) of participants were literates and 04 (4%) were illiterates.

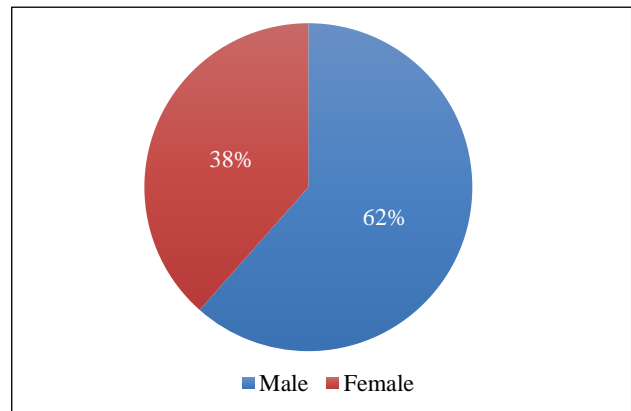


Figure 1: Diabetic patients according to sex.

Table 1: Distribution of diabetic patients according to age.

Age in year	Number of patients (%)
20-40	9 (8.7%)
41-60	65 (62.5%)
61-80	30 (28.8%)
>80	0 (0%)

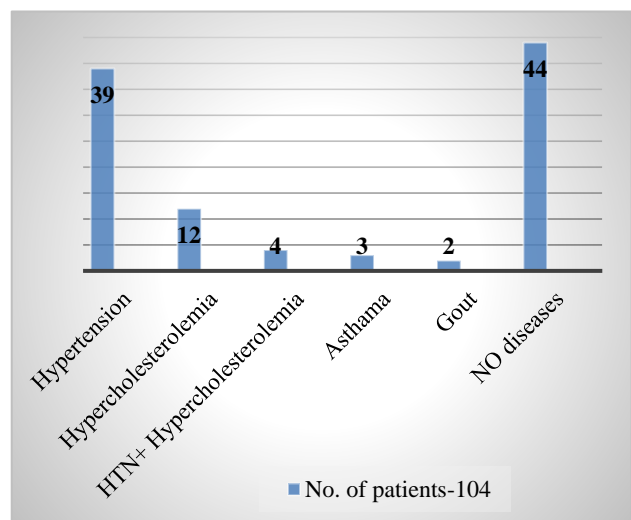


Figure 2: Distribution of concurrent illness.

Out of 104 patients, 62 patients (60%) having strong family history in their development of diabetes mellitus. A total of 35 (34%) participants were found to be habituated to tobacco smoking and only 7 (07%) had the history of alcohol consumption. Co-morbidity has been shown to intensify health care utilization and to increase medical care costs for patients with diabetes.

Figure 2 showed that out of 104 patients, 60 patients (57.69%) having co morbid conditions. Out of which the majority of patients (37.5%) having hypertension along with type 2 DM followed by hypercholesterolemia.

Table 2 indicated that 40 patients (38.46%) were receiving monotherapy and 32 (30.76%) patients receiving two drug therapy. 07 (6.7%) receiving three drug therapy and 12 (11.53%) taking four drugs in their prescriptions. 1 (0.9%) patients were receiving 8 drugs through their prescriptions.

Table 2: Incidence of polypharmacy.

Number of Drug	No. of patients (%) n=104
1	40 (38.46%)
2	32 (30.76%)
3	07 (6.7%)
4	12 (11.53%)
5	04 (3.8%)
6	08 (7.69%)
7	00 (0%)
8	01 (0.9%)

Table 3: Monotherapy and combination therapy of anti-diabetic drug in a prescription.

Drug therapy	No. of patients
Monotherapy	40 (38.46%)
Two drug Therapy	38 (36.5%)
Three drug therapy	23 (22.11%)
Four drug therapy	03 (2.8%)

This Table 3 indicated that about 48.46% patients receiving anti diabetic mono-therapy followed by two drug therapy (36.5%), then three drug therapy (22.11%) and four drug anti diabetic therapy (02.8%).

Table 4 showed the prescribing pattern of anti-diabetic drugs and showed that metformin was the drug which prescribed most frequently followed by voglibose, glimepiride, sitagliptin, vildagliptin, glibenclamide, glipizide etc. In two drug combination therapy metformin+glimepiride combination (25%) was widely used.

The Table 5 showed that metformin was prescribed most frequently, 23 times (57%) in patients with monotherapy.

Table 4: Utilization pattern of anti-diabetic drugs.

Drugs	No. of times prescribed
Metformin	39
Sitagliptin	05
Voglibose	14
Insulin	21
Glipizide	02
Glibenclamide	03
Glimepiride	10
Pioglitazone	03
Vildagliptin	03
Metformin+ Glibenclamide	06
Metformin+Glipizide	08
Metformin + Sitagliptin	06
Metformin+ Voglibose	07
Metformin + Gliclazide	02
Metformin + Glimipride	25
Metformin + Vildagliptin	02
Metformin+ Glimipride + Pioglitazone	01

Table 5: Patients on monotherapy.

Name of drug	No. of Patients (n=40)
Metformin	23 (57%)
Insulin	04 (10%)
Glimepiride	03 (7.5%)
Voglibose	03 (7.5%)
Pioglitazone	03 (7.5%)
Vildagliptin	02 (5%)
Glibenclamide	01 (2.5%)
Glipizide	01 (2.5%)

DISCUSSION

Diabetes mellitus is a one of the important public-health problem worldwide. Its prevalence is rising in many parts of the developing world, and India is no exception to this.¹⁰ India is the diabetes capital of the world with 41 million Indians having diabetes; every fifth diabetic in the world is an Indian. It also leads in prevalence of metabolic syndrome as well as obesity. 20 million Indians are either obese or abdominally obese with children being the prime targets and by 2025, the expected number is 68 million.¹¹ Individuals with Type 2 DM are considered on high priority as they are potential candidates for rapid evaluation to prevent and halt the progression of complications.¹⁰ There are many classes of drugs were used widely for the treatment of diabetes and in the initial stages, single oral agents can be used to control the glucose level, but in later stages combination therapy may be needed for better glycemic control and prevention of micro and macro vascular complications.¹² However, the use of these drugs should provide optimal benefit, they should be safe, efficacious, cost effective and rational.¹³ Hence, the present study aimed to evaluate

the prescription trend of anti-diabetic drugs in diabetic outpatients.¹²

In our study, the male patients were predominated and the same report were also found by Brahmabhatt SV et al, Vengurlekar S et al, Boccuzzi, Yurgin N et al and showed that there occurs male preponderance in the prevalence of diabetes.¹⁴⁻¹⁶ Majority of our patients were in the age group of 41-60 years (62.5%) which is in concordance with the earlier published literat.^{15,17} Hypertension (37.5%) was the most common co-morbid condition, followed by hypercholesterolemia (11.5%). Different studies from India and other countries have reported a similar observation with regard to the co-morbidity in patients with diabetes. However, the prevalence of hypertension has ranged from 31 to 70%.^{18,19}

In this study 38.5% of patients receiving monotherapy and the same results was also reported by Brahmabhatt SV et al.¹⁴ This study showed that metformin was prescribed most frequently, 23 times (57%). Metformin were mainly prescribed in this study as it has been shown to be cost effective in addition to giving the advantage of better compliance. Metformin provides all these advantages and hence it was seen in this study as the predominantly prescribed oral anti-diabetic drug both in combination and mono therapy.

In addition to reducing body weight without causing hypoglycemia, it also reduces macro vascular complications like myocardial infarction and stroke. L. voglibose, was the most frequently prescribed drug followed by Metformin. Voglibose is an alpha-glucosidase inhibitor used for lowering post-prandial blood glucose levels in people with diabetes mellitus. Metformin is most frequently prescribed drug in combination therapy also.

A 44.6% patients were received glimepiride+metformin combination therapy followed by glipizide+metformin, voglibose+metformin, glibenclamide+metformin. Akila et al also found that metformin predominance in monotherapy.²⁰ Soumaya MA et al, reported that the most commonly used anti-diabetic medications in monotherapy were metformin (18.8%) followed by insulin (14.2%), glimepiride (3.6%) and glibenclamide (2.5%). Among two drug combination therapy, glimepiride+metformin (13.2%) was the most commonly prescribed followed by metformin+insulin (12.2%).¹²

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