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Original Article

Evaluate the Prescription Pattern of Anti-Diabetic Patients Attending Medicine Out-Patient Department of a Tertiary Care Hospital

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ABSTRACT

The aim of the present study is to evaluate the prescription pattern of anti-diabetic patients attending medicine OP in a tertiary care hospital, to evaluate their adherence to treatments guidelines and to assess the rationality behind drug usage. It is a Retrospective Observational Study of 354 patients. The results were expressed in descriptive statistics. It was concluded that due to lack of patient compliance and ineffective control of blood sugar by monotherapy number of drugs used per patient is justified and polypharmacy noted is inevitable. Clinicians have to be educated and made intellectually aware of benefits of selecting more drugs from National List of Essential Medicines to rationalize drug therapy for cost efficiency and better patient compliance.

Keywords: Diabetes Mellitus, Drug Utilization, Drug Rationality, Prescription Pattern, National List of Essential Medicine.

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INTRODUCTION

Diabetes mellitus is a pandemic disease that has struck each and every corner of the world. The number of people developing DM is currently increasing worldwide in an alarming exponential proportions; this may be connected to a rapid rise in risky health behaviors, urbanization and aging. According the official WHO estimates, the total global diabetic population in the year 2000 stood at 171,000,000 which is estimated to spike up to a whopping 366,000,000. According to the International Diabetes Federation Atlas 2015, an estimated 69.2 million Indians are diabetic, which as per the WHO assessment stood at 63 million in the year 2013.[1] In the United States, the estimated number of people over 18 years of age with diagnosed and undiagnosed diabetes is 30.2 million. The figure represents between 27.9 and 32.7 percent of the population.[2] Various classes of anti-diabetic drugs including insulin and oral hypoglycemic agents (OHA) are currently used in the treatment of diabetes, which acts by different mechanisms to reduce the blood-glucose levels to maintain optimal glycemic control.[3]Complications that arise with diabetes mellitus ranges from diabetic retinopathy, nephropathy, neuropathy and coronary artery disease, diabetic foot ulcer and other infections.[4]

Drug utilization research is defined as the study on marketing, prescription, distribution and use of drugs in the society with emphasis on medical, social and economic consequences.[5] Drug utilization pattern studies provide data on prescribing pattern and improve the prescribing habits. Some factors which influence drug utilization pattern are medical needs and demands, cost of drugs, economy, drug industries, technological developments, geographical location, culture and tradition. The proper and necessary drugs should be provided to the patients only after considering the various factors listed. Some reasons for improper prescription are lack of knowledge on some drugs, increase in number of patients and improper diagnosis. Thus the drugs used are indicators of health and disease.

As type 2 diabetes mellitus patients need to take drugs lifelong, it is important to understand and study drug utilization patterns and prescribing patterns regularly in such patients. Drug utilization changes with time, disease conditions and population region. Hence drug utilization must be monitored frequently.[6] The studies on drug utilization pattern help to understand and to create baseline strategies that have to be adopted under different conditions to optimize medication. Study related to drug utilization of anti-diabetic drugs is of paramount importance to promote rational drug use and disseminate valuable information to health teams to ensure that. Also irrational prescribing can lead to increased cost of drugs, which often leads to non-adherence.[7]

This study deals with the prescription pattern of these drugs, to evaluate their adherence to treatments guidelines and to assess the rationality behind drug usage patients attending medicine OP in a tertiary care hospital.

MATERIALS AND METHODS

Study design: This study was conducted at Saveetha Medical College Hospital, a super specialty tertiary care teaching hospital in Thandalam, Chennai. This retrospective observational was conducted over a period of two months from November 2018 to January 2019.

Sample size: The sample size for the study was calculated using the statistical formula that takes in to account the margin of error and prevalence of the study population.

Study setting and population: The present study is planned to be conducted on patients of either sex attending the general medicine out-patient department of a tertiary care hospital.

Inclusion criteria:

- All patients diagnosed with type 2 diabetes mellitus of either sex attending the general medicine OPD.
- Newly diagnosed and registered patients between the months of November 2018 and January 2019.

Exclusion criteria:

- All patients admitted in the medicine ward.
- Illegible prescription
- Incomplete patient data.
- Patients with type 1 diabetes mellitus, Gestational diabetes.
- Patients diagnosed and registered before the month of November 2018 and after January 2019.

Ethical considerations: The study was conducted after getting prior approval from the Institutional Ethics Committee and also from the Department of General Medicine. Data of all the out patients diagnosed with diabetes mellitus attending medicine department from November 2018 to January 2019 was collected from the prescriptions given to them. The patients' age, gender, diagnosis, grade/stage of disease, drugs used, dosage frequency, dosage route and form and duration of treatment were collected. WHO drug prescribing

indicators was used to find the rationality of drugs prescribed.

RESULTS AND DISCUSSIONS

Data of all the out patients diagnosed with diabetes mellitus attending medicine outpatient department was collected from the prescriptions advised to them. Prescription pattern along with treatment was noted. In total, 354 patients were included in the study based on inclusion and exclusion criteria.

Out of 354 patients, 180(51%) were male and 174(49%) were female. The ratio between the same was 1.034:1 (Table 1).Out of this, patients over the age of 60 were affected the maximum. 137(39%) of patients over the age of 60 were affected. (Table 2). Total number of prescriptions analysed were 354 out of which Oral hypoglycemic agents consisted of 262(74%) and OHAs along with insulin was given to 92(26%) of the patients. (Fig 1).
The OHA (Oral Hypoglycemic Agent) most commonly prescribed with insulin was Sulfonylureas (39.86%) mainly Glimepiride followed by Gliclazide and the Metformin (34%) was the second most common drug to be used along with insulin. (Fig 2).

Monotherapy(59.03 %) was the most preferred treatment.(Fig 3) Fixed drug combinations mainly dual therapy (35%) and triple therapy (5.9%) were also given to patients according to their requirement. The drug Metformin (34%) was the most preferred drug for Monotherapy followed by Sulfonylureas (22%) mainly Glimepiride (16.7%) and Gliclazide (5.3%) and Thiazolidinediones (Pioglitazone)(3%).

The mainly used FDCs are sulfonylurea and biguanides(21%) followed by Biguanides and Dipeptidyl peptidase-4 inhibitors (11%), Alpha glucosidase inhibitor and Biguanides (3%) .Most commonly prescribed triple therapy is Alpha glucosidase inhibitor and FDC-Sulfonylureas and Biguanides (6%).

Table 1: Demographic Details: Gender distribution.

Parameters	Number
Male	180 (51%)
Female	174 (49%)
Male: Female Ratio	1.03:1

Table 2:- Demographic Details: Age Distribution.

Age(in years)	Number
<30	5(1%)
31-40	53(15%)
41-50	65(18%)
51-60	94(27%)
>60	137(39%)

Figure 1: Percentage of Oral Hypoglycemic Agents and Insulin Preparations Prescribed.

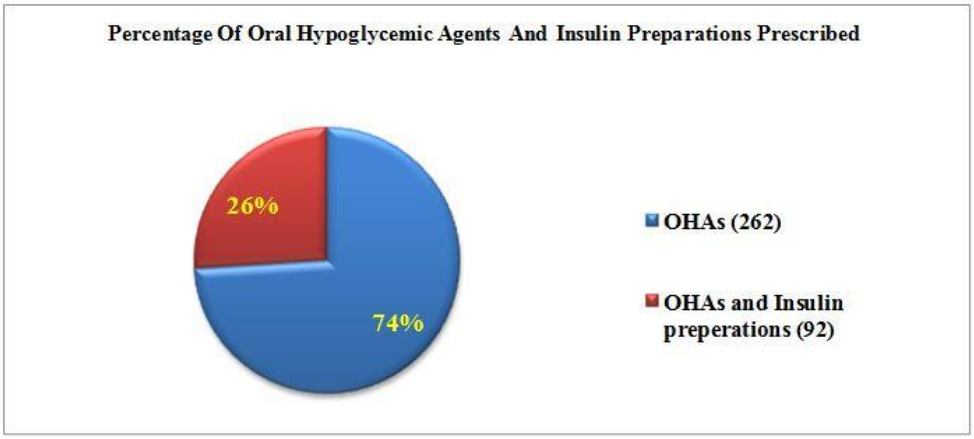


Fig 2: OHA Drug Commonly Prescribed With Insulin

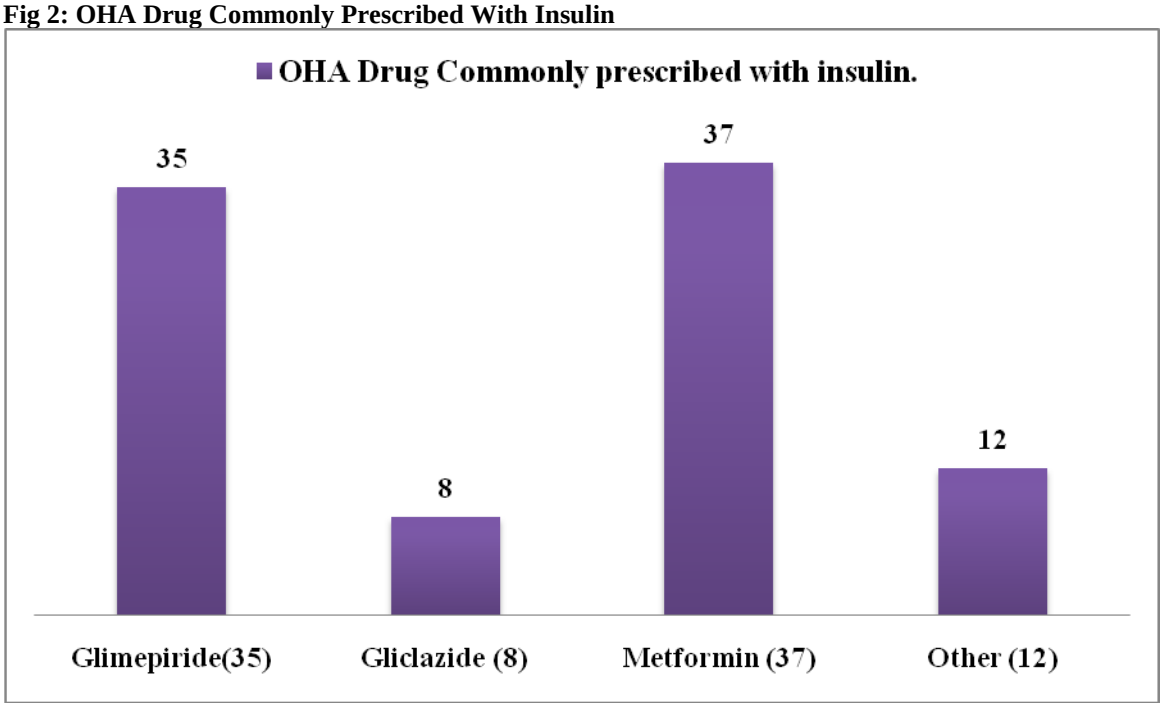


Fig 3: Distribution Based on Drug Combination

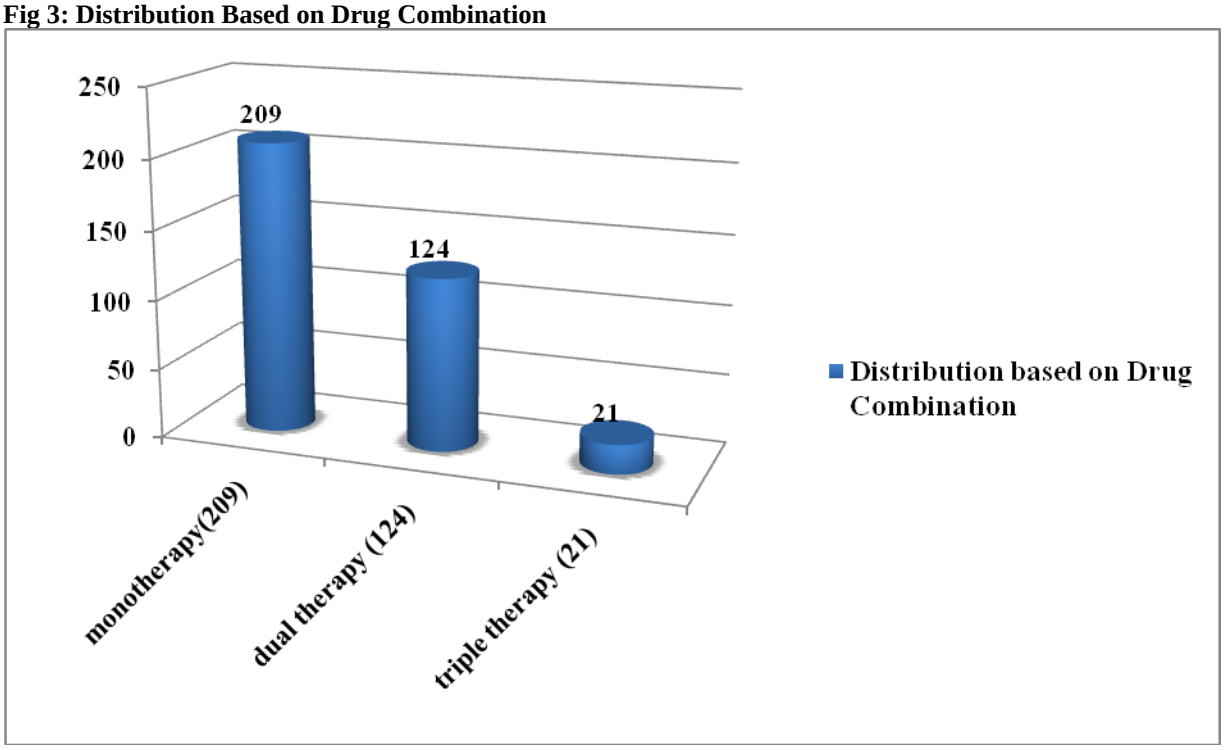
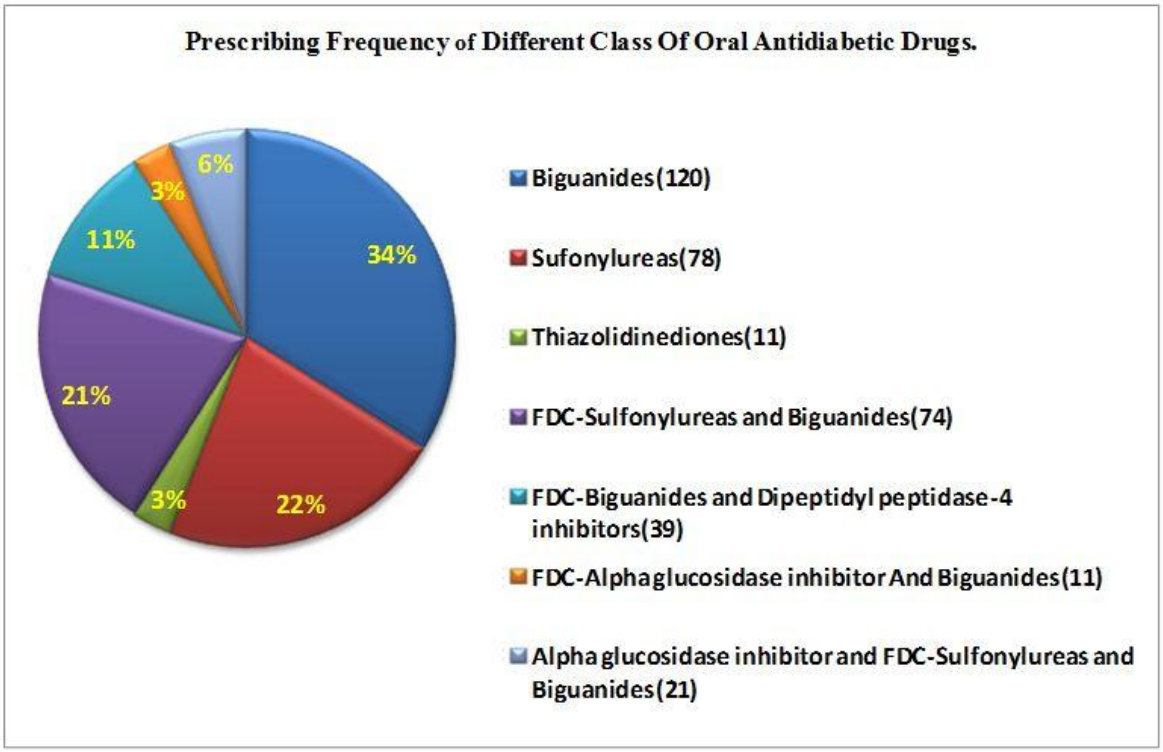


Fig 4: Prescribing Frequency of Different Class of Oral Antidiabetic Drugs



able 3: Prescribing Frequency of Different Antidiabetic Drugs

S.no	Drugs	Number
1.	Metformin(500mg)	120
2.	Glimepiride + Metformin(1mg)	5
3.	Gliclazide + Metformin(80mg)	2
4.	Pioglitazone(15mg)	11
5.	Teneligliptin+ Metformin(500mg)	39
6.	Voglibose + Metformin(0.3mg)	11
7.	Glimepride(1mg)	59
8.	Gliclazide(40mg)	19
9.	Glimepiride(2mg)+ Metformin(500mg)+ Voglibose(0.3mg)	21
10.	Glimepiride (2mg) + Metformin (500mg)	67

Out of 354 patients, 180(51%) were male and 174(49%) were female. The ratio between the same was 1.034:1.There is a slight male predominance which coincides with study done by Sudha Vengurlekar et al [8].This maybe due to the fact men are less sensitive to insulin and due to distribution of body fat around the liver and waist. The most common affected age group was over 60.137(39%) of patients over the age of 60 were affected. This is not in accordance to study conducted by Zuhayer Ahmed et al [7] in Bangladesh where the commonly affected age group was 47-61.This may be due to lack of physical activity and sedentary lifestyle seen with increased age. The average number of anti-diabetic drugs per prescription in this study was 1.2. Many Previous hospital based studies done in India and Abroad has reported 2-5 drugs per prescription.[9, 10.] Our study showed restraint on polypharmacy. Total number of prescriptions analysed were 354 out of which Oral hypoglycemic agents consisted of 262(74%) and OHAs along with insulin was given to 92(26%) of the patients.This was found in accordance to study done by Krishna G. Seshadri et al.[3,11] The OHA(Oral Hypoglycemic Drug) most commonly prescribed with insulin was Sulfonylureas (39.86%) mainly Glimepiride followed by Gliclazide. Metformin (34%) was the second most common drug to be used along with insulin. This was found in accordance to study conducted by Veeranna Karadi et al.[12] Metformin(34%) was the

most preferred drug for Monotherapy followed by Sulfonylureas(22%)

This was found in accordance to many studies conducted. [8,9,13].This may be due to the fact that metformin was the only drug of its class to be prescribed, whereas many second generation sulfonylureas are available and were prescribed making their individual frequency low but as a group/class their prescribing was higher than biguanide class. Also metformin promotes weight loss and can be given to obese patients and it also has been a drug of choice for pre diabetics.

The study documented low prescribing frequency of newer OHA (thiazolidinedione and DPP 4 inhibitors). They were used in combination with other OHAs in order to achieve better glycemic control which was similar to previous studies.[14, 15]

The most prevalent anti-diabetic therapy was monotherapy either with OHA while combination therapy with OHA's and insulin was to a lesser extent. Study by Willey has documented good glycemic control on monotherapy.[16]

Most commonly used FDC is that of biguanides and sulfonylureas (21%) This is in accordance with study conducted by Akshay A et al [3].This is maybe due to the fact that FDCs have better patient compliance when compared to Dual drug therapy.[17]

CONCLUSION

This study reveals the current drug prescribing pattern of clinicians towards patients with type 2 diabetes mellitus in the medicine OPD. Treatment for diabetes is essential to prevent risk of cardio vascular diseases as well as microvascular diseases. Due to lack of patient compliance and ineffective control of blood sugar by monotherapy number of drugs used per patient is justified and polypharmacy noted is inevitable. Clinicians have to be educated and made intellectually aware of benefits of selecting more drugs from National list of Essential Medicines to rationalize drug therapy for cost efficiency and better patient compliance.

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