



## DRUG UTILIZATION STUDY OF ANTI-DIABETIC AGENTS IN A TERTIARY CARE HOSPITAL

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### ARTICLE

### ABSTRACT

#### Key words:

Drug Utilization Studies, Diabetes Mellitus, Metformin, Glimepiride, Antibiotics

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**Introduction:** Drug utilization studies are prerequisite for drug policy formulations. It is well-known that inappropriate drug use results in problems like drug interactions, ecological disturbance and affects overall treatment. These studies should be conducted to decrease drug and health related treatment expenditure, to improve health related quality of life, to improve medical treatment quality, to decrease the number of medication related problems and errors, to decrease hospitalization, to improve prescriber's practice and awareness towards appropriate prescribing. **Methodology:** This is a retrospective and prospective observational study, conducted over a period of six months (October 2019-March 2020). The required data of the patients, meeting the inclusion criteria, was documented in data collection form and analyzed. **Results:** During the study period, a total of 85 patients were enrolled and most of the patients were in the age group of 60 to 69 years (35.2%) and majority being males 56 (65.8%). The most common comorbid illness was hypertension (80%). This study showed that combination therapy is mostly preferred 62.3%. The most common drug used was metformin as monotherapy and metformin plus glimepiride as combination therapy and also showed that most of the patients received at least one antibiotic (50.58%). Most of the medicines were prescribed in oral route of administration. **Conclusion:** It concluded that risk of diabetes increases after 40 years of age, males were more prone to the diabetes, prescribing trend is moving away from monotherapy to combination therapy and most of the prescriptions included at least one antibiotic

### INTRODUCTION

**Diabetes mellitus:** "Diabetes Mellitus (DM) is a metabolic disorder of multiple etiologies, characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action or both."<sup>[1]</sup> Drug utilization is defined by the WHO as "The study of the

Marketing, distribution, prescription and use of drugs in a society with special emphasis on the resulting medical, social and economic consequences".<sup>[2]</sup> Drug utilization studies (DUS) are framing up a drug policy for a disease; they offer methods which are useful in training and teaching drug therapies to all health care professionals. It is well-known that inappropriate drug use

results in problems like drug interactions, ecological disturbance and affects the diagnosis. Drug utilization studies identify the problems caused due to irrational use of drugs in Healthcare delivery system and also highlight the current approach for the rational use of drugs.<sup>[1]</sup> The irrationality in drug use is caused due to misuse, overuse and underuse of drugs thus failing to achieve the optimal drug therapy. Inappropriate use of drugs leads to increased medical expenses, adverse effects, patient morbidity/mortality and antimicrobial resistance; hence DUS became a potential tool in evaluating health care systems.<sup>[3]</sup>

#### Why should we conduct drug utilization studies?

- To decrease the drug and health related treatment costs.
- To improve health related quality of life.
- To improve medical treatment quality.
- To decrease the number of medication related problems and errors.
- To decrease hospitalizations.
- To improve prescriber's practice and awareness towards appropriate prescribing.<sup>[4]</sup>

#### Importance of drug utilization studies in diabetes:

Diabetes mellitus has become an important public health problem worldwide. In cases of irrational prescribing of hypoglycemic agents, there are chances that the patients do not get benefitted and there are also chances that the patients end up in critical and life threatening situations which in turn escalate health care cost. So there is a need to perform drug utilization studies on hypoglycemic agents to provide useful information into current prescribing patterns and identify irrational prescribing.<sup>[5]</sup>

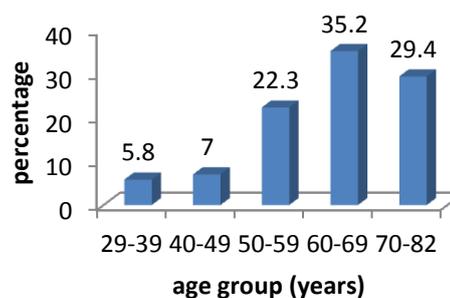
#### METHODOLOGY

This is a retrospective and prospective observational study, conducted over a period of six months from October 2019 to March 2020 in a tertiary care hospital. Patients who are newly diagnosed and known cases of diabetes mellitus, patients with diabetes and any other comorbidities, receiving hypoglycaemic agents, patients of both genders and age group of 18 years and above were included in the study. Patients with

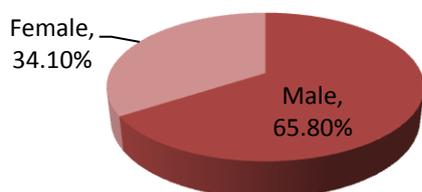
gestational diabetes mellitus and pediatric patients were excluded. A suitable data collection form was designed to collect, document and analyze the data. The data collection form included the provision for the collection of information such as demographic details (name, age, gender, weight, height and date of admission), chief complaints, past medical history, past medication history, diagnosis, medications used like name of the medication, dose, frequency, route of administration and daily progress notes. The data required for the study was obtained from inpatient case notes and treatment charts. All the collected data was entered in to Microsoft access 2010 for easy accessibility, retrieval and analysis of the data. The data was analyzed using Microsoft Excel 2010.

#### RESULTS

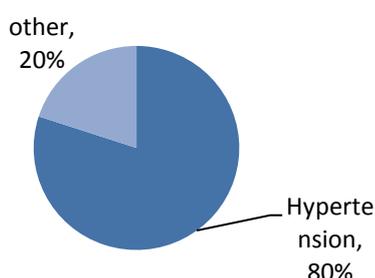
During the study period a total of 85 patients were enrolled, majority being males 56 (65.8%) followed by females 29 (34.1%) and most of the patients were in the age (in years) group of 60-69 i.e., 30 (35.2%), followed by 70-82 i.e., 25 (29.4%), 50-59 i.e., 19(22.3), 40-49 i.e., 6 (7.0%), 29-39 i.e., 5 (5.8%). The common co-morbid condition was found to be hypertension 68 (80%). This study showed that combination therapy is most commonly preferred 64.7% than monotherapy 35.29%. The most common drug used is metformin as monotherapy and metformin+glimepiride as combination therapy, also showed that most of the patients received at least 1 antibiotic 43(50.58%), followed by 2 antibiotics 26 (30.58%) and revealed that most of the patients received oral therapy (56.47%), followed by combination of oral and insulin (24.70%).



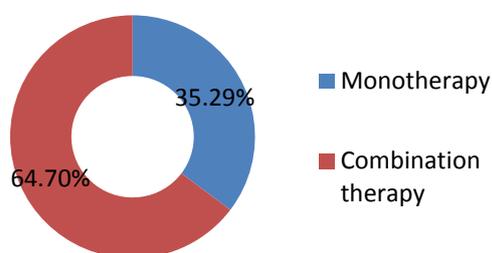
**Figure.1 Patients distribution according to age group**



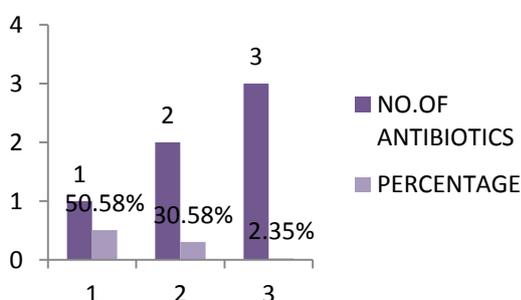
**Figure.2 Patients distribution according to gender**



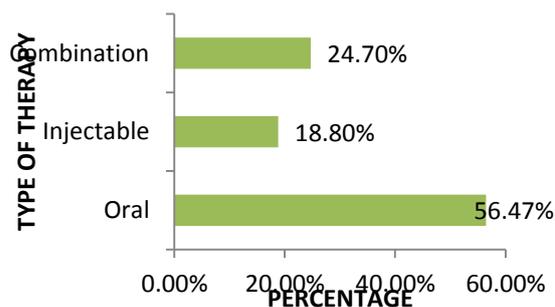
**Figure.3 Patients distribution according to co-morbid state**



**Figure.4 Patients distribution according to therapy**



**Figure.5 Number of antibiotics used by patients**



**Figure.6 Patients distribution according to oral, injectable and combination therapy**

### DISCUSSION

The study found that out of 85 patients, majority were in the age group of 60-69 years (35.2%), followed by 50-59 years (22.3%). The incidence of the disease was high may be due to advancing age and comorbidities. This result is consistent with the results of a study carried out by H. Vedavathi and Shreenivas. P. Revankar which revealed that incidence of the disease was high after age of 40 years.<sup>[6]</sup> Following an analysis of patients' demographic details, it was found that majority of the patients were males 56 (65.8%) than females 29 (34.1%). This result is consistent with results of a study carried out by AfrozAbidi, Dilshad Ali Rizvi and Ali Ahmed which showed that out of 262 patients 141(53.82%) were males and 121 (46.18%) were females.<sup>[7]</sup> The result was somewhat different from that observed in study carried out by Sunaina, Joshi Yogesh and Singh Ankita.<sup>[8]</sup> An analysis of co-morbid illness with diabetes was done and the results showed that the most common comorbidity was hypertension which accounted about 80% of the total population, followed by heart disease (22.3%). This result is consistent with the results of a study carried by Ameera Khalam, Chandrasekhar Dilip and Cholanugath Shinu which showed that hypertension was present in 53.5% of total population.<sup>[1]</sup> An analysis of the therapy was done and the study showed that most of the patients received combination therapy (62%) than monotherapy (38%) and also revealed that the drug metformin is commonly prescribed as monotherapy and metformin+glimepiride as combination

therapy. This result is relevant with the study done by Sekhar Mandal, Tamoghna Maiti, Asoke Das and Abhijit Das which showed metformin was commonly prescribed as monotherapy (79.6%) and metformin+glimepiride (45.5%) as combination therapy. [9] An analysis was done which revealed most of the patients received at least 1 antibiotic.

An analysis of therapy was done which showed that most of the patients received oral therapy (56.47%), insulin alone (18.80%), and combination of both oral and insulin (24.70%). This is relevant with the study done by H. Vedavathi, Shreenivas P. Revankar which showed Insulin alone was prescribed in 25.54% cases. [6]

#### Future directions

- The study should be carried out in wide range of population.
- The study should be an interventional type.
- The study should be carried out for long period of time so, that we can get best results.
- People should be made aware of the incidence and consequences of the diabetes mellitus.

#### Limitations

- Study was single centered conducted in less number of population and over a less period of time.
- It is an observational study.
- The study was limited to patients of age greater than 18 years.

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**Contribution:** All the authors have contributed in conception and design, acquisition of data, collection and assembly of data.

**Conflict of interest:** The authors declare that there is no conflict of interest.

#### NOVELTY OF WORK:

- The following are our findings:
- Most of the patients with Diabetes Mellitus were in the age group of 60-69 years.

- Combination therapy is mostly preferred.
- Most of the prescriptions included at least one antibiotic.

#### CONCLUSION

The study reveals that majority of patients suffering from diabetes mellitus were males and most of them were in the age group of 60-69 years. It also showed that most of them were hypertensive followed by other diseases and heart diseases. It concluded that prescribing trend is moving away from monotherapy to combination therapy and most commonly used drug was metformin as monotherapy and metformin+glimepiride as combination therapy. It also showed that most of the prescription included at least one antibiotic.

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