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RESEARCH ARTICLE

STUDY OF PRESCRIPTION PATTERN IN DIABETES MELLITUS PATIENTS IN A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Background: Diabetes Mellitus (DM) is a group of metabolic diseases characterized by increased glucose level in blood. Type 1 DM usually accounts up to 10% of all diabetes cases whereas, Type 2 DM accounts up to 90% of all diabetes cases. DM can be fatal if proper treatment and care is not taken.

Objectives: The aim was to evaluate the drug prescribing pattern of anti-diabetic drugs among diabetic patients.

Method: Prospective observational study was conducted in the department of General Medicine and Endocrinology at a tertiary care teaching hospital. Data was obtained by medical records and patient interview and entered in suitable designed data collection form.

Result: Out of 122 patients, 83% were type 2 DM patients and 17% were Type 1. Average drug per prescription was 4.25. Metformin in combination with glimepiride was prescribed commonly.

Conclusion: Combinational therapy predominantly two drug therapy is a new trend in tackling diabetes mellitus.

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INTRODUCTION

Diabetes Mellitus (DM) is a group of metabolic diseases characterized by hyperglycaemia and abnormalities in carbohydrate, fat, and protein metabolism arising from shortcomings in insulin secretion, insulin action, or both. The long term effect of hyperglycaemia is accompanied with dysfunction and failure of various other organs such as eyes, heart, blood vessels, and kidneys. Walker and Whittlesea (2011)

Type 1 Diabetes Mellitus generally develops in childhood or early childhood and results from destruction of pancreatic beta cells leading to complete insulin deficiency state. Destruction of about 80%-90% pancreatic beta cells in hyperglycaemia. This destruction of pancreatic beta cells is autoimmune-mediated and the factors that initiate such auto-immune response are unknown. However, the process is mediated by macrophages and T lymphocytes with circulating autoantibodies to various beta cells antigens. Type 1 Diabetes mellitus usually accounts up to 10% of all diabetes cases. Wells, DiPiro *et al.* (2011) ; Kasper, Braunwald *et al.* (2005).

On the other hand, Type 2 Diabetes Mellitus accounts up to 90% of all diabetes cases. Insulin resistance and relative insulin deficiency are indicated in Type 2 diabetes mellitus. Insulin resistance is due to increased and free fatty acid production, increased hepatic glucose production, and decreased skeletal muscles glucose uptake of glucose. Type 2 diabetes mellitus occurs due to diabetogenic lifestyle such as excessive calories, inadequate exercise, and obesity. Gestational Diabetes mellitus, diseases of the exocrine pancreas (e.g. pancreatitis), endocrine disorders like acromegaly, Cushing's syndrome and medications (e.g. glucocorticosteroids, pentamidine, niacin, and alpha-interferon) are the rare causes of diabetes mellitus generally 1% to 2% of all diabetes cases. (Walker and Whittlesea (2011); Wells, DiPiro *et al.* (2011)

According to International Diabetes Federation (IDF), the number of people with diabetes in the world in 2013 was 382 million, which is going to double by 2035 to almost 592 million. India could be the home to a large number of people suffering from diabetes. According to IDF, in the year 2013, 65.1 million of adults in India were diagnosed with diabetes mellitus. Federation. (2015)

The general pharmacological approach for hyperglycaemia include Insulin such as rapid acting insulin, short acting insulin,

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intermediate acting insulin, long acting insulin and pre mixed insulins. The most common anti diabetic agents are sulfonylureas, meglitinides (short acting insulin secretagogues), biguanides, thiazolidinediones, alpha glucosidase inhibitors, etc. Combination with metformin are also prescribed. Strom (2006)

A prescription is a written advice that mentions drugs and other instructions given to either pharmacist or chemist to dispense the drugs to patients for the proper treatment of disease. It provides information like an adequate dose of the drug to be given, its duration and the way it has to be taken. Rational prescribing of drugs for cure and healing of a disease is extremely important for well-being of the patients. Drug use evaluation or prescription pattern evaluation is an ongoing, authorised and systematic quality improvement process which is designed to review drug use and provide feedback to physicians and researchers, drug and therapeutic committee members to determine drug use and to develop criteria and standards to describe optimal drug usage. (Parthasarathi, Nyfort-Hansen et al. 2004)(Devi, Alex et al. 2015, Ahmed, Hafez et al. 2016)

This study is, therefore, aimed at determining the pattern of prescription among diabetic patients. We tried to describe the socio-demographic characteristics of the diabetic patients getting treatment in The Oxford Medical College, Hospital and Research Centre at Bangalore and identify the pattern of prescriptions of anti-diabetic agents among them.

METHOD

This prospective observational study was conducted for over a period 3 months (October 2015-December 2015) in the department of General Medicine and Endocrinology at the Oxford Medical College, Hospital and Research Centre, a tertiary care, teaching and referral hospital at Bangalore.

Adult diabetic patients either newly diagnosed or known cases of diabetes irrespective of sex and race admitted in the department of General Medicine and Endocrinology were included in the study. All diabetic patients who were in optimal mental condition and receiving at least one antidiabetic drug in last six months were included. However, diabetic patients who were disoriented and below the age of 18 were excluded. Also, patients with malignancy, pregnant and lactating females were excluded from the study.

Patient data relevant to the study were obtained by examination of patient’s medical record files, direct interrogating the patients or patient’s relatives and hospital nurses. The data was obtained and recorded in suitable designed data collection form. Details about demography, medical history, social history, duration of diabetes, family history of diabetes, co-morbid conditions, and antidiabetic drug utilization, were collected.

The data thus obtained from suitable designed data collection forms were then entered into Microsoft Excel 2013 and all analyses were performed.

RESULT

A total of 122 Diabetic patients were evaluated in the study. Majority of patients were from the age group 51-60 years. The average drug per prescription was 4.25.

Out of 122 diabetic patients, 54 patients (44.26%) were males whereas, 68 patients (55.73%) were females.

Furthermore, 101 patients had Type 2 diabetes mellitus, whereas 21 patients suffered from Type 1 diabetes mellitus. Among the Type 2 diabetic patients, 56 patients had a family history of diabetes, 33 patients had no family history while the details for 12 patients was not available. Likewise, among the 21 Type 1 diabetic patients, 10 had a family history of diabetes mellitus and 2 patients had no history of diabetes while details of 9 patients was not available.

Type of Diabetes Among Patients

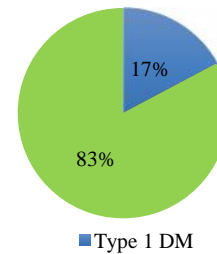
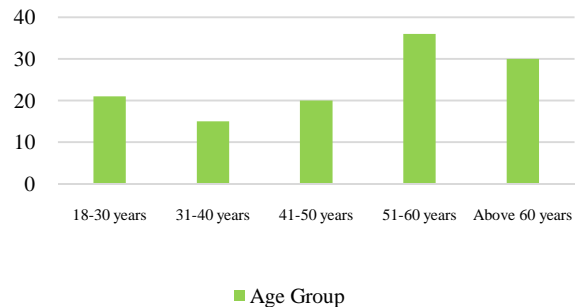


Figure 1 Type of Diabetic Patients

Age wise distribution of Patients



Graph 1 Age wise distribution of Patients

Table 1 Religion wise distribution of patients

Religion	Number	Percentage
Hindu	89	72.95%
Islam	30	24.59%
Christianity	3	2.45%

Table 2 Level of Education

Level of education	Number	Percentage
Primary Education (Below Xth Standard)	87	71.3%
Secondary Education	35	22.9%

Table 3 Duration of Diabetes among patients

Duration	Male	Male Percentage	Female	Female Percentage	Total	Percentage
Less than 5 years	23	42.59	35	51.47	58	47.54
5-10 years	19	35.18	25	36.76	44	36.06
More than 10 years	12	22.22	8	11.76	20	16.36

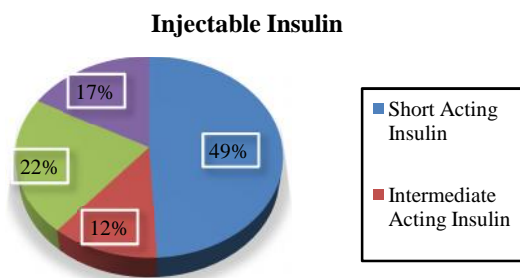


Figure 2 Type of Injectable Insulins

Dosage Forms of Anti Diabetic Drugs

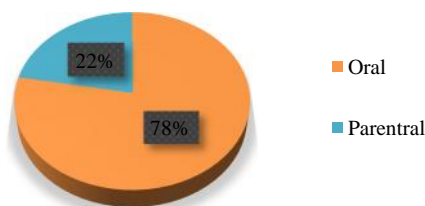
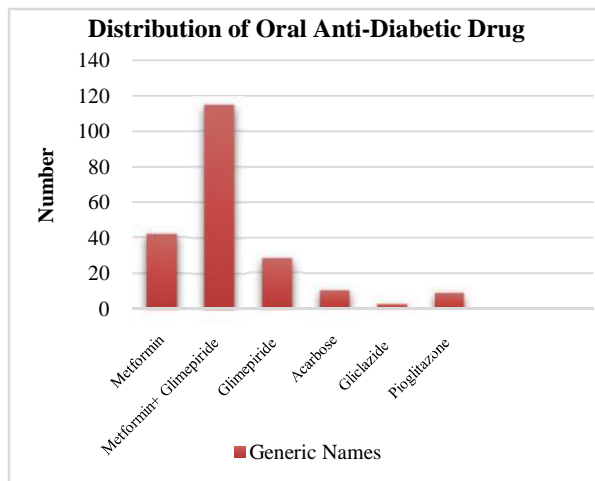


Figure 3 Type of Anti-Diabetic Dosage form prescribed

Table 4 Distribution of co-morbidities

Distribution of Co-morbidities	Frequency	Percentage
Chronic Kidney Disease	26	21.31
Hypertension and other	42	34.42
Cardiovascular Disease	10	8.19
COPD	7	5.37
Osteoarthritis	7	5.37
Hypothyroidism	8	6.55
Parkinson Disease	22	18.03
None		



Graph 2 Distribution of Oral Anti-Diabetic drugs

Table 5 Common class of drugs prescribed along with Diabetes

Therapeutic Class	Frequency	Percentage
Anti-Diabetic Drug	266	51.25
Cardiovascular Drugs	70	13.48
Diuretics	52	10.01
Vitamins and Mineral Supplements	85	16.37
Gastrointestinal Drugs	26	5.00
Anti-Parkinson Disease	6	1.15
Anti-Asthmatic Drugs	9	1.73
Steroids	5	0.93

Table 5 Distribution of Anti-Diabetic Drugs

Anti-Diabetic Class	Frequency	Percentage
Insulin	59	22.18
Biguanides	42	15.78
Sulfonylureas	31	11.65
Alpha glucosidase inhibitors	10	3.75
Thiazolidinediones	9	3.38
Combinational Drugs	115	43.23

DISCUSSION

Diabetes mellitus is a chronic enduring disease affecting a large unit of residents in the developing countries including India. Only single oral agents can be used to control the glucose level at early stages, but in later stages combination therapy particular metformin and glimepiride may be needed for better glycaemic control and prevention of micro and macro vascular complications that may arise. Hence, the present study was aimed to evaluate the prescription trend of anti-diabetic drugs in diabetic in-patients.

In a similar study, metformin was commonly prescribed followed by combination of metformin and glimepiride among diabetic outpatients. (Devi, Alex *et al.* 2015) Our study shows, combination therapy of metformin and glimepiride was prescribed more frequently to diabetic in-patients followed by single therapy of metformin and glimepiride respectively.

Out of 122 diabetic patients, 54 were males whereas 68 were females which goes to show that the females were predominated in the study which is in concordance with similar kind of study conducted in a tertiary care hospital at Bangladesh. (Ahmed, Hafez *et al.* 2016)

CONCLUSION

Our study showed, metformin and combination therapy of metformin and glimepiride was prescribed to a large extend which indicates low utilization of other anti-diabetic class of drugs particularly sulfonylureas and combination of sulfonylureas and metformin. This indicates the need for more therapeutic interventions for physicians to prescribe rational drugs while opting for an oral anti-diabetic agents. A larger study could not be possible due to a number of unavoidable factors, hence we suggest that for better understanding of drug utilization pattern, a larger study with probability sampling should be conducted among diabetic in-patients.

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Conflict of Interest

"There is no conflict of interest". In case, no information was provided by authors whatsoever then by signing the Copyright

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