



International Journal of Medicine and Pharmaceutical Research

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Research Article

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Prescription Pattern for Type-2 Diabetes Mellitus Patient

G. Tharunasree, B. Kumar*, P. Kiranmayee

Department of Pharmacy Practice, Ratnam institute of Pharmacy, Pidathapolur (V&P), Muthukur (M), Nellore -524 346

ABSTRACT

This study aim to evaluate prevalence rate of type II diabetes mellitus in males and females and the prescription pattern for type 2 Diabetes mellitus patient. The current objective of study is to screen the prescription trends in type2 diabetes mellitus patients. In this study, 180 cases were collected in which determines OADDS therapy were administered for type II DM patients rules out generic or essential drug prescribing. The study was Simple Prospective observational study which was carried out for a period of six months. The patients were collected based on inclusion and exclusion criteria. The results will be analyzed. In this study 180 cases involving OADDS administration were included. Maximum numbers of patients were in the age group of 41- 60 years (48.33%) and among 180 cases, males constituted 90 (50%) and females 90 (50%). Out of 180 patients 102 patients (66.27%) patients were found suffering with co morbid concurrent illness hypertension followed by cardio complications associated (HTN-IHD, HTN-CAD, OTHERCOMORBIDITIES). The percentage of patients on anti-diabetic immunotherapy (80, 44.44%), dual-therapy (68, 37.78 %), triple therapy (32, 17.78 %). The study reveals that human insulin preparation is the most prescribe in 40 patients (22.22 %). The study have shown that majority of patients with type-II DM were managed insulin immunotherapy as well the current prescribing trends of oral anti-diabetic drugs strategies achieved. The drug-drug interactions deserve clinical attention and management by clinical pharmacist interventions. The management of concurrent illness (i.e. co morbid cardio-complications more ratios associated with type-2 DM hypertension angina MI CCF arrhythmias).Clinical effectiveness of therapy is influenced by prescriber agent selection and therapy changes as well patient's adherence with prescribed drug regimens.

Key words: Prescription, Type 2, Diabetes mellitus, patients, doctors

ARTICLE INFO

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Article History: Received 12 July 2017, Accepted 21 August 2017, Available Online 10 October 2017

*Corresponding Author

B. Kumar
Department of Pharmacy Practice,
Ratnam institute of Pharmacy,
SPSR Nellore District-524346
Manuscript ID: IJMPR3540



PAPER-QR CODE

Citation: B. Kumar, et al. Prescription Pattern for Type-2 Diabetes Mellitus Patient. *Int. J. Med. Pharm. Res.*, 2017, 5(5): 161-166.

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1. Introduction

Diabetes mellitus (DM) is one of the most common chronic diseases in nearly all countries. Diabetes mellitus is an elevated blood glucose associated with absent or inadequate pancreatic insulin secretion, with or without concurrent impairment of insulin action [1]. According to the diabetes atlas published by the International Diabetes Federation (IDF), there is an estimated 40 million persons with diabetes in India in 2007 and this number is predicted to rise to almost 70 million people in 2025. The study of prescribing pattern is a component of medical audit that does monitoring and evaluation of the prescribing practice of the prescribers as well as recommends necessary modifications to achieve rational and cost-effective medical care and it help to evaluate and suggest modifications in prescribing practices of medical practitioners so as to make medical care rational [2].

Prescription pattern monitoring studies (PPMS) are drug utilization studies with the main focus on prescribing, dispensing and administering of drugs. They promote appropriate use of monitored drugs and reduction of abuse or misuse of monitored drugs. PPMS also guide and support prescribers, dispensers and the general public on appropriate use of drugs, collaborate and develop working relationship with other key organizations to achieve a rational use of drugs [3]. Prescription Patterns explain the extent and profile of drug use, trends, quality of drugs, and compliance with regional, state or national guidelines like standard treatment guidelines, usage of drugs from essential medicine list and use of generic drugs. There is increasing importance of PPMS because of a boost in marketing of new drugs, variations in pattern of prescribing and consumption of drugs, growing concern about delayed adverse effects, and cost of drugs and volume of prescription [4].

The aim of PPMS is to facilitate the rational use of drugs in a population. Irrational use of medicines is a major problem worldwide. The overuse, underuse or misuse of medicines results in wastage of scarce resources and widespread health hazards. The rational use of medicines (RUM) is defined as "Patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community [5]. A large number of studies have been conducted to study the prescribing pattern of physicians across the country. The studies conclude the irrational prescribing practices of prescribers and suggest RUM at all levels of health care delivery system. However, no systematic reviews, meta-analyses, or randomized controlled trials are present about the relevance of PPMS in promoting rational use of drugs [6].

2. Methodology

In this study, 180 cases were collected in which describing the selection therapy and drugs were administered for type II diabetes mellitus as well choice ascertained to concurrent illness. The study was Simple Prospective observational

study which was carried out for a period of six months [10]. The patients were involved in the study based on inclusion and exclusion criteria. In this study, the type of OAADs mostly administered to patients whether single or in combination triple therapy was evaluated. The gender, age of the patient, type of OAADs and type of co morbid concurrent illness with relevancy were studied. However it collectively notifies the chance of actual and potential drug interactions of drugs essentially severe [7]. The results were analyzed.

Study site:

The study was conducted at department of general medicine, ACSR Government medical college, Nellore

Study design:

It is a prospective observational study at department of general medicine, ACSR Government medical college, Nellore.

Study period:

A period of six months in ACSR Government medical centre and hospital.

Inclusion criteria:

1. Type 2 diabetes (m & f patients)
2. Age > 18 years
3. Hospitalized for complications like macro vascular (coronary artery disease, HTN, peripheral vascular disease).
4. History of heart failure, myocardial infarction, coronary revascularization (percutaneous coronary intervention or coronary artery bypass graft surgery), or stroke in the last 6 months [8].

Exclusion criteria:

1. Age below 18 years
2. Gestational diabetic patients
3. Juvenile D.M patients.

Data collecting method:

The study was conducted on the basis of patient perspective and is a sort of prevalence based study. The medical history consisting of inpatient medical records are reviewed for specific period of time [9]. Data recorded as patient demographic characteristics, clinical status duration of disease, type of complication, length of stay.

3. Results and Discussion

Results: In this anti-diabetic study 180 cases involving O.H.As administration were included. Table 1 gives demographic characteristics of patients to whom O.H.As were administered based on age and gender. Maximum numbers of patients were in the age group of between 41-60 years (48.33 %) (Illustrated in table 1 and Fig.2) and among 180 cases, males constituted 90 (50%) and females 90 (50%). The prescription were analyzed estimates of 1287 drugs prescribed to the type II DM patients in our study, 1257 drugs were prescribed by their brand names. Average number of drugs per prescription 6.43%. As well prescriptions included antibiotics 49(3.80%), injections (140 10.87%). The percentage of patients on anti-diabetic monotherapy (50%), dual-therapy (37.77%), triple therapies (17.77%) were shown in fig.8 and table 6 and 7 respectively. The study reveals that human insulin preparation is the most prescribe in 40 patients (22.22 %).

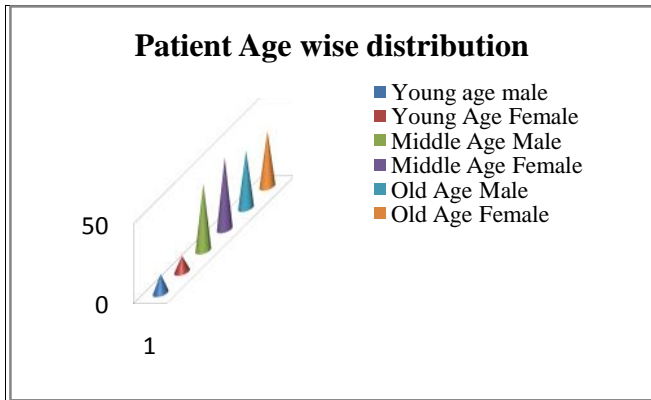


Figure 1: Patient Demographic Characteristic (Sex and Age Wise Distribution)

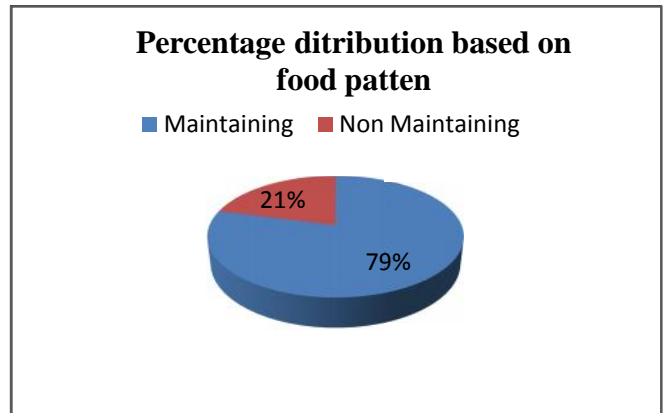


Figure 5: Percentage Distribution Patten Based on Maintaining of Food patten

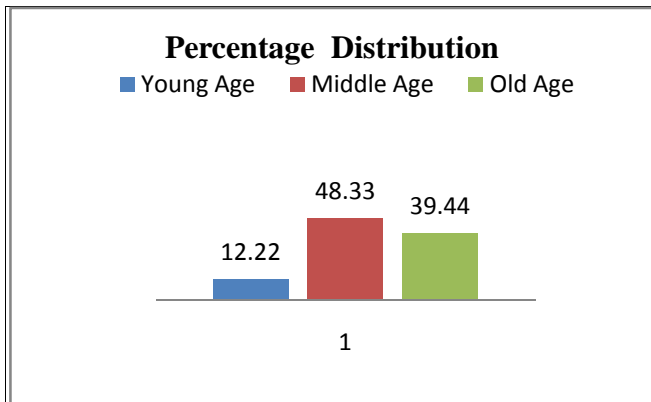


Figure 2: Percentage distribution of Demographic Characteristic of Age Wise Distribution.

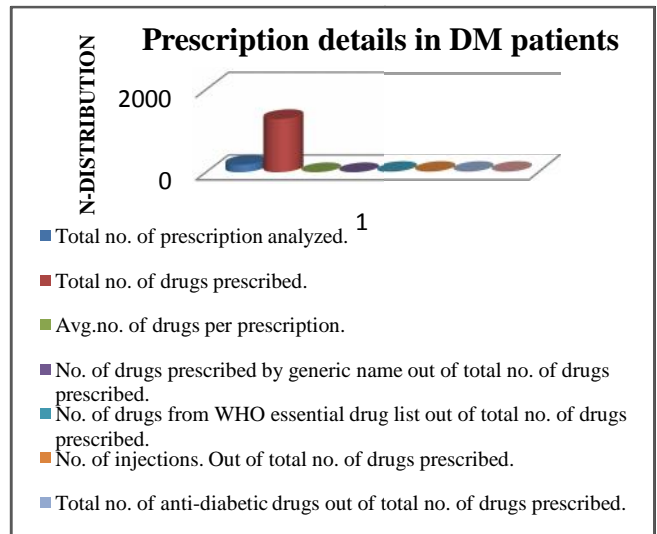


Figure 6: Prescription Details in Diabetes Mellitus Patients

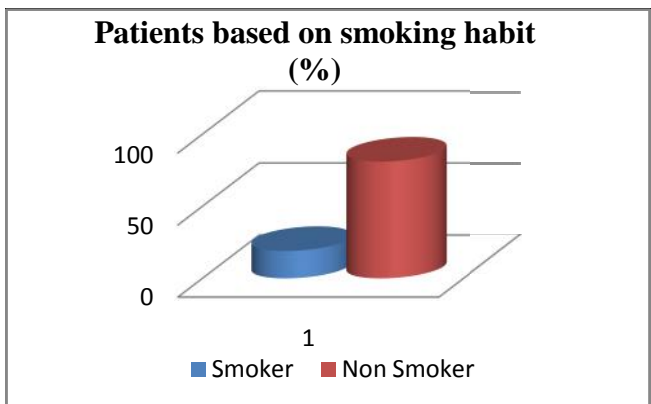


Figure 3: Distribution of the Patients Based on Smoking Habit

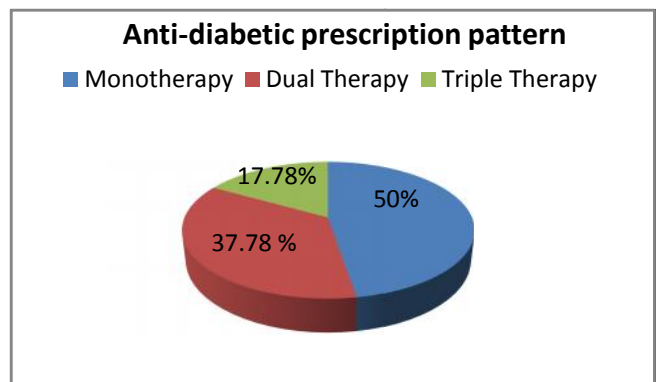


Figure 7: Anti-Diabetic Prescription Pattern

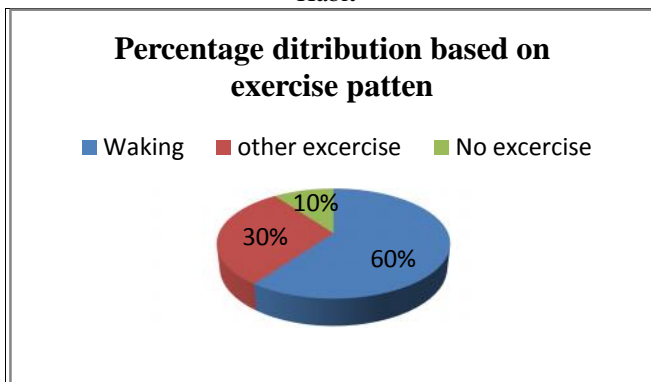


Figure 4: Percentage Distribution Based on Exercise Patten
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Discussion: Diabetes mellitus is seemingly one of the active major non communicable diseases which are growing very fast .The prevalence of diabetes mellitus in our study set up was 12.70% .In our study the prevalence of type II Diabetes mellitus was high in males of ratio in percentage 50% (n-90). Males have predominance in the study population with the results of various studies in India and United States. The present study indicates the general trend of administration of OADDs and co morbid illness drugs treating in the general medicine ward of hospital.

Demographic characteristics showed that out of 180 patients, administration of OADDs, to male were 90 (50%) and female were 90 (50%) and the maximum distribution of use of OAADs were administered in the patients between the age group of middle age between 41-60 (48.33 %) and followed by old age group 60 years (39.44%) and 18-40 years (12.22 %). There was high prevalence in middle age group due to life style habits, obese, physical inactivity, smoking; alcoholism (males) unmask blood sugar to rise. However the pattern of anti-diabetic drug utilization most common therapy in which the oral anti diabetic drugs prescribed were mono therapy was (44.44 %), others, followed by dual therapy (37.77%), triple therapy (17.78%) in this study. In this study the commonly individuals drugs given were insulin 40 (22.22%), metformin 28 (15.56%), glimepiride 05 (2.78%), glipizide 02 (1.11%), Repaglinide 02 (1.11%) and voglibose 03 (1.67 %). The various combination drugs includes dual therapy (37.78 %) drug choice enlisted were Metformin+glimepiride 38 (21.11%), Insulin+metformin 09 (5%), Insulin + glipizide 02 (1.11%), Insulin + glimepiride 02 (1.11%), Metformin+glipizide 10 (5.56%), Metformin+dpp4 (sitagliptin) 03 (1.67%) and Metformin + glibenclamide 04 (2.22%). In triple-therapy Insulin+metformin+glimepiride 04 (2.22%), Glimipride + metformin + pioglitazone 04 (2.22%), Insulin + metformin+ glipizide 20(11.11%), Insulin+ metformin+ repaglinide Sitagliptin 04 (2.22%). When cases were screened thoroughly, it was found that numbers of cases of Monotherapy cases were (n-90) and combination therapy cases were (n-68). This shows that prescription suggested for administration was more preferred to be mono-therapy. Among the use of combination therapy drugs in number dual therapy (68), triple therapy (32).

The prescription trends were analyzed, out of 1287 prescribed to the type II DM patients, 1257 drugs were prescribed by their brand names. The average number of drugs per prescription is 6.43% which was moderately high when compared to previous records .it is recognized that patients with diabetes mellitus are generally prescribed more drugs than others .prescriptions for injections 140 (10.87%) and antibiotics 49 (3.80%). 90.35% of drugs were by their brand names which is higher and 2.33% were prescribed by generic names which lower in the study. In department of medicine, Bharati hospital, Poona1. While another study conducted by M. Ashok Kumar et al in Tamilnadu2 reveals that average number of drugs per prescription, percentage of drugs from WHO essential drug and injections were higher, whereas the percentage of anti-diabetics prescribed were found to be lower than study conducted by. A prospective drug utilization study is

considered to be one of the most effective methods to assess and evaluate the prescribing pattern and help to promote rational use of drugs. In patients with type II DM treatment may be initiated with monotherapy followed by early intervention with a combination of oral anti-diabetic agents. In our study insulin as a monotherapy secured highest utilization percentage 40 (22.22 %) among all anti-diabetic drugs .Numerous studies show that a combination of insulin and metformin is more effective than insulin alone in treatment of type II DM patients. In few patients failure of OAADs allowed to switch over insulin preparations. Combination of glimepiride and metformin were most widely used, frequently prescribed (21.11%).which is comparatively beneficial as a sort of rational suggestion in treatment. Metformin does not promote weight gain and chosen over cardio vascular risk factors. Accordingly metformin is regarded as drug of choice for most patients with type II DM. This study supports 15.56 % received metformin as well combination with other OADDs.

4. Conclusion

The study has shown that majority of patients with type-II DM were managed insulin Monotherapy [40 patients (22.22%)] as well the current prescribing trends of oral anti-diabetic drugs strategy do achieve an optimal glycaemia control. However combination therapies of insulin with different oral anti-diabetic drugs were prescribed for proper glycaemia control in severe glycaemia levels. Diabetic clinics should be strongly encouraged for optimal or even (good) tight glycemic control with mono or dual therapy in order to prevent early emergence of micro vascular complications that leads to increased morbidity and mortality in these patients.

The epidemic rise of diabetic prevalence was gradually high in current years. It need conventional therapies and intense management of type-II DM for adequate metabolic control of blood glucose level should be achieved in prescribing appropriate therapy and newer agents like DPP-IV inhibitors for the management of DM. The management of concurrent illness (i.e. comorbid cardio-complications more ratios associated with type-2 DM hypertension angina MI CCF arrhythmias). The results of present study highlights the need for comprehensive management of diabetic patients including life style changes, dietary control hypoglycemic agents, cardiovascular prevention, treatment of complications, and co morbidity. Clinical effectiveness of therapy is influenced by prescriber agent selection and therapy changes as well patients' adherence with prescribed drug regimens.

Table 1: Patient Demographic Characteristic (Sex and Age Wise Distribution)

| PATIENT CHARACTERISTICS | NUMBER OF CASES | | PERCENTAGE DISTRIBUTION |
|--------------------------|-----------------|-------------|-------------------------|
| | N=180 | | |
| AGE IN YEARS | MALE n=90 | FEMALE n=90 | |
| Young group(18-40years) | n= 12 | n=10 | 12.22% |
| Middle age (41-60 years) | n=42 | n=45 | 48.33% |
| Old Age (Above 60) | n=36 | n=35 | 39.44 % |

| GENDER WISE PERCENTAGE DISTRIBUTION | | |
|-------------------------------------|----|------|
| MALE | 90 | 50 % |
| FEMALE | 90 | 50 % |

Table 2: Distribution of the Patients Based on Smoking Habit

| Sino | Types (Male and Female) | Percentage |
|------|--------------------------|------------|
| 1 | Smoker | 19 % |
| 2 | Non Smoker | 81% |

Table 3: Distribution Based on Exercise Patten

| Sino | Types of exercise | Percentage |
|------|-------------------|------------|
| 1 | Waking | 60 |
| 2 | other exercise | 30 |
| 3 | No exercise | 10 |

Table 4: Distribution Patten Based on Maintaining of Food Habit According To the Prescription

| S.no | Types | Percentage |
|------|-----------------|------------|
| 1 | Maintaining | 79% |
| 2 | Non Maintaining | 21% |

Table 5: Prescription Details in Diabetes Mellitus Patients

| Details of prescription | Number |
|---|-------------|
| Total no. of prescription analyzed. | 180 |
| Total no. of drugs prescribed. | 1287 |
| Avg.no. of drugs per prescription. | 6.43% |
| No. of drugs prescribed by generic name out of total no. of drugs prescribed. | 30(2.33%) |
| No. of drugs from WHO essential drug list out of total no. of drugs prescribed. | 581(90.35%) |
| No. of injections. Out of total no. of drugs prescribed. | 140(10.87%) |
| Total no. of anti-diabetic drugs out of total no. of drugs prescribed. | 344(26.90%) |
| No. of encounters with antibiotics prescribed. | 49(3.80%) |

Table 6: Utilization Pattern of Anti-Diabetic Drugs

| Drugs | Total number of prescriptions | Percentage |
|---|-------------------------------|------------|
| Mono therapy | | |
| Biguanides (metformin) | 28 | 15.56 % |
| Sulfonylurea's (glimepiride) | 05 | 2.78 % |
| Sulfonylurea (glipizide) | 02 | 1.11 % |
| Meglitinides(Repaglinide) | 02 | 1.11 % |
| Alpha-glycosidase(voglibose) | 03 | 1.67 % |
| Insulin | 40 | 22.22 % |
| Dual therapy | | |
| O.H.As | N | % |
| Metformin +glimepiride | 38 | 21.11 % |
| Insulin+ metformin | 09 | 5 % |
| Insulin + glipizide | 02 | 1.11 % |
| Insulin+ glimepiride | 02 | 1.11 % |
| Metformin+glipizide | 10 | 5.56 % |
| Metformin+dpp4(sitagliptin) | 03 | 1.67 % |
| Metformin + glibenclamide | 04 | 2.22 % |
| Triple therapy | | |
| O.H.As | N | % |
| Insulin+metformin+glimepiride | 04 | 2.22 % |
| Glimipride+metformin+pioglitazone | 04 | 2.22 % |
| Insulin+metformin+glipizide | 20 | 11.11 % |
| Insulin+metformin+repaglinide+ Sitagliptin | 04 | 2.22 % |

Table 9: Anti-Diabetic Prescription Pattern

| Type of therapy | N | % |
|-----------------------------|----|---------|
| Monotherapy | 80 | 44.44 % |
| Dual therapy(combination) | 68 | 37.78 % |
| Triple therapy(combination) | 32 | 17.78 % |

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