ASSESSMENT OF PRESCRIBING PATTERN OF TYPE 2 DIABETIC PATIENTS ATTENDING TERTIARY CARE TEACHING HOSPITAL, RMMCH, CHIDAMBARAM.

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Abstract

Diabetes mellitus is one of the most common public health concerns among children and elderly now a days. The motive of this study is to ascertain the prescribing pattern, complications associated with t2diabetes mellitus, medication compliances among the patients and to assess the effective anti-diabetic drug. Prescription pattern monitoring studies mainly concentrate on prescribing, dispensing, administering of drugs and they encourage the use of monitored drugs and depletion of abuse or misuse of the drugs.

Keywords: T2DM, glycemic control, PPA, OHA, Insulin, diabetes mellitus.

1. Introduction

Diabetes mellitus is one of the largest global public health problem which impose a heavy global burden on public health as well as socio-economic development.[1] Up to date, the International Diabetes Federation (IDF) have evaluated that 451 million adults live with diabetes universe in 2017 with a projected rise to 693 million by 2045 if no essential preventive methods are followed.[2] Diabetes mellitus is a national as well as universal epidemic disease in terms of incidence, healthcare costs and overall complications as presented by the centre for disease control (CDC).[3] Diabetes or Diabetes mellitus is defined as chronic, metabolic disease characterised by elevated levels of glucose or sugar in blood. Gradually it leads to the major damages to heart, kidney, blood vessels, eyes, and nerves. It emerges because of the body is not able to produce needed insulin for its own, that may be due to impaired insulin secretion, impaired insulin action, or both.[4] Insulin and Glucagon maintains the balance of blood glucose level and they are generated in the Islets of Pancreas.

The 3main categories of diabetes mellitus are, type 1diabetes mellitus, type 2diabetes mellitus and diabetes during pregnancy. Type1 diabetes mellitus arises due to the genetic reasons and leads to the insulin absolute deficiency. This usually occur in young age that is under 30years of age. It causes 15 to 20% of the populations. They are of faster onset of symptoms. Type 2diabtes mellitus accounts total 90% of cases and they occur in the age group of above 40years of old they are of slower onset of symptoms.[5] Pregnancy period diabetes happens due to the intolerance and it occurs due to overweight, glycosuria, more than 4kg weight of previous baby etc..[6] Fragility, dysuria, excess thirst, unexplained weight loss, presence of the ketones in the urine, vision problem, slow healing process, high bp, frequent infections (gums, skin, vaginal or bladder) are the main symptoms of diabetes mellitus.[7] Type 2diabetes mellitus treatment include Oral hypoglycemic

agents or Insulin or both. This is a drug utilization study which has been designed to find out the rational use of drug among the population.

2. Materials and methods

A retrospective observational study was conducted in the department of medicine at Rajah Muthiah medical college and hospital, Annamalai university, during the period of 5months from January 2021 to May 2021 with a study duration of 2years (June 2018 to November 2020). Patients who admitted inpatient department with the complaints of type II diabetes mellitus with the age group of 25years to 85years were included in the study.

The data were collected with the help of a well-designed data collection form. Patients with other comorbidities like diabetic foot ulcer, coronary artery disease, chronic kidney disease, diabetic ketoacidosis, diabetic neuropathy, diabetic nephropathy, diabetic retinopathy, hypertension were included. Patients below 18years and prescriptions of patients with any mental illness were excluded from the study.

Complete details of the patients were recorded in the data collection form. The demographic details, medical histories, therapeutic management and lab report which includes biochemical profiles such as fasting blood sugar (FBS), randomized blood sugar (RBS), post prandial blood sugar (PPBS), blood pressure (BP), body mass index (BMI) and other relevant investigational results were collected from the case sheets in MRD.

Statistical analysis

The data were collected and entered in Microsoft excel software 2007 and interpreted by descriptive statistics to analyze and express the report as percentages and counts in the form of figures and tables.

3. Results and discussion

Sample for this research included 100 patients who visited for inpatient service in the department of medicine at Rajah Muthiah Medical College and Hospital. The research was conducted over a period of 5months from January 2021 to May 2021 with a duration of 2years.

3.1 Demographical profiles of patients

Among 100 participants, 25 years to 85years patients with type II diabetes mellitus were selected. It was more prevalent in the age group between 56-65years and it was found to be 36% followed by the age group 46-55 years (23%). Males (53%) were more prevalent to type II diabetes mellitus than females (47%). Social habits which include smoking, alcoholic and both were included in the study. 49% of them were associated with some social habit, 20% of them were smoker, 16% of them were alcoholic and 13% of them were both smoker and alcoholic.

Table 3.1a: Indicates age wise distribution of the patients.

Sl. No	Age Group	Number of Patients (100)	Percentage (%)
1	25-35	9	9%
2	36-45	18	18%
3	46-55	23	23%
4	56-65	36	36%
5	66-75	11	11%
6	76-85	3	3%

Table 3.1b: Indicates gender wise distribution

Sl. No	Gender	Number of patients (100)	Percentage (%)
1	Male	53	53%
2	Female	47	47%

Table 3.1c: Indicates social habit wise distribution

Sl. No	Social Habit	Number of Patients (100)	Percentage (%)
1	Smoker	20	20%
2	Alcoholic	16	16%
3	Smoker and Alcoholic	13	13%
4	No social habit	51	51%

3.2 Life style wise distribution

Life style of the patients were studied, 61% of them followed sedentary lifestyle were as 39% of them followed non-sedentary life style. Weight of patients were taken to obtain BMI status. 45% of them were over-weight, 28% of them were obese and 22% of them were in healthy weight. Family history of type II diabetes patients were collected, 91% of them had a previous history of diabetes mellitus and 9% of them had no history of diabetes mellitus.

Table 3.2a: Indicates life style wise distribution.

Sl. No.	Life Style	Number of Patients (100)	Percentage (%)
1	Sedentary	61	61%
2	Non- Sedentary	39	39%

Table 3.2b: BMI wise distribution

Sl. No.	Weight Status	Number of Patients (100)	Percentage (%)
1	Under Weight	5	5%
2	Healthy Weight	22	22%
3	Over Weight	45	45%
4	Obese	28	28%

Table 3.2c: Family history of the patients with diabetes.

Sl. No.	History of diabetes	Number of Patients (100)	Percentage (%)
1	Yes	91	91%
2	No	9	9%

3.3 Co-morbidity wise prevalence among the participants

On the prevalence of co-morbidity among the study participants shows 90% of them had other comorbidities and 10% of them were without comorbidities. 45% of them were with diabetic foot ulcer, 11% of them were with diabetic keto acidosis, 10% of them with chronic artery disease and 9% of them were with hypertension.

Table 3. 3a: Indicates comorbidities of type II diabetes patients.

Sl. No.	Comorbidities	Number of Patients (100)	Percentage (%)
1	With comorbidities	90	90%
2	Without comorbidities	10	10%

Table 3.3b: Indicates the types of comorbidities in diabetic patients.

Sl. No.	Comorbidity	Number of Patients (100)	Percentage (%)
1	Diabetic Foot Ulcer	45	45%
2	Diabetic Neuropathy	4	4%
3	Diabetic Nephropathy	4	4%
4	Diabetic Gastropathy	1	1%
5	Diabetic Retinopathy	3	3%
6	Diabetic keto Acidosis	11	11%
7	Chronic Artery Disease	10	10%
8	Chronic Kidney Disease	6	6%
9	Hypertension	9	9%
10	Stroke	1%	1%

3.4 Treatment wise distribution

Among the treatment, total number of anti-diabetic drugs prescribed in 100 prescriptions were found to be 205. Average number of anti-diabetic drugs encountered per prescription was found to be 2.05. A total of 438 drugs were prescribed and the average drugs per prescription was found to be 4.38. 95% of the drugs were prescribed in generic name. OHA were the most prescribed drugs followed by Insulin. Biguanides 79% (Metformin) were the most commonly prescribed anti-diabetic drug, followed by sulphonyureas 45% glimepride 31% and glibenclamide 14%. In the case of Insulin, Inj. H. Actrapid (28%) was the mostly prescribed drug followed by 16% Inj. H. Monotard and 12% Inj. H. Mixtard. Among the drug prescription pattern, 49% of the patients were prescribed with combination therapy of two drugs, followed by monotherapy 31% and 20% of them followed with combination of three drugs. Metformin with sulfonylureas were prescribed to 29% of the population followed with Metformin and Insulin 7%. In the case of three drug combination, metformin with sulfonylurea and DPP4 inhibitors 12% were mostly prescribed combinations followed by metformin, sulfonylureas and Insulin 6%.

Table 3.4a: Indicates the drug details prescribed for the type II diabetic patients.

Sl. No.	Drug Name	Number of Prescription	Percentage
1	Insulin	56	12%
2	OHA	149	34.01%
3	Antiplatelet	12	2%
4	Angiotensin receptor blockers	24	5.47%
5	Beta blockers	20	4.5%
6	Calcium channel blockers	16	3.65%
7	Nitrates	9	2.05%
8	Diuretics	14	3.19%
9	Alpha adrenergic	8	1.82%
10	ACE inhibitors	22	5.02%
11	Proton pump inhibitors	24	5.47%
12	Antiemetic	7	1.59%
13	Calcium, Folic acid, iron	8	1.82%
14	Antipyretic, Analgesics	24	5.47%
15	Antibiotic	45	10.27%

Table 3.4b: Indicates the distribution of OHAs.

Sl. No	Medications	No. of Prescriptions	Percentage
1	Glimepiride	31	31%
2	Glibenclamide	14	14%
3	Glipizide	1	1
4	Metformin	79	79%
5	Vildagliptin	10	10%
6	Teneligliptin	10	10%
7	Voglibose	4	4%

Table 3.4c: Indicates Insulin wise distribution.

Sl. No.	Insulin	Number of prescriptions (100)	Percentage (%)
1	Inj. H. Actrapid	28	28%
2	Inj. H. Mixtard	12	12%
3	Inj. H. Monotard	16	16%

Table 3.4d: Indicates the distribution of the diabetic patients according to drug prescription pattern.

Sl. No.	Drugs	Number of Patients (100)	Percentage (%)
1	Monotherapy	31	31%
2	2 Drug combination	49	49%
3	3 Drug combination	20	20%

Table 3.4e: Indicates the prescription pattern of anti-diabetic drug therapy

(Monotherapy).

Sl. No	Drugs	No. of Patients (31)	Percentage (100)
1	Metformin	14	14%
2	Insulin	10	10%
3	Glimepiride	7	7%

Table 3.4f: Indicates the prescription pattern of anti-diabetic drug therapy (two drug combination).

Sl. No.	Drugs	No. of Patients (49)	Percentage (100)
1	Metformin + Sulfonylureas	31	29%
2	Metformin + Insulin	16	7%
3	Metformin + Voglibose	1	1%
4	Sulfonylurea + Insulin	1	1%

Table 3.4g: Indicates the prescription pattern of anti-diabetic drug therapy (three drug combination).

Sl. No.	Drugs	No. of Patients (20)	Percentage (100)
1	Metformin+Sulfonylurea+DPP4 Inhibitor	12	12%
2	Metformin + Sulfonylurea+ Insulin	6	6%
3	Metformin+ DPP4 Inhibitor+ Voglibose	1	1%
4	Metformin+ DPP4 Inhibitor+ Insulin	1	1%

3.5 WHO core drug prescribing indicators

Among the WHO core drug prescribing indicators, Average number of drugs per prescription was found to be 4.38, percentage of drugs prescribed by generic name was found to be 95%, percentage of encounter with an antibiotic prescribed was found to be, 10.27%, percentage of encounter with an injection prescribed was found to be 12.7%. Percentage of drugs prescribed from essential drug list was found to be 40.25%.

Table 3.5a: WHO Core Prescribing Indicators

Sl. No.	Parameter	Value	WHO Standards
1	Average number of drugs per prescription	4.38	1.6 to 4.8
2	Percentage of drugs prescribed by generic name	95%	100%
3	Percentage of encounter with an antibiotic prescribed	10.27%	20 to 26.8%
4	Percentage of encounter with an injection prescribed	12.7%	13.4 to 24.1%
5	Percentage of drugs prescribed form essential drug list	40.25%	100%

3.6 Medication compliance

The extent to which patients correctly followed the medical advices were analyzed in this study through their prescriptions. The most of the patients (38%) of them had poor drug compliance, 37% of them had fair drug compliance and 25% of them had good medication compliance.

Table 3.6a: Indicates the medication compliance.

Sl. No.	Compliance	Number of Patients	Percentage
1	Good	25	25%
2	Fair	37	37%
3	Poor	38	38%

4. Conclusion

As diabetes mellitus is a challenging issue, drug compliance and medication adherence are the important factors for the treatment success. Demographic analysis showed that diabetes mellitus associated with other comorbidities affects the normal life style of the people and causes risk for their life. Also, poor health literacy and socio-economic status leads to the negative clinical outcome. Among prescription studies, most commonly utilized drug class was biguanide followed by sulphonyl ureas and in the case of insulin, Inj. H. Actrapid was prescribed. Metformin with glimepiride was the most frequently prescribed combination therapy.

Thus, it can be concluded that to achieve better glycemic control antidiabetic therapy have chosen combination therapies. This study also reveals that the patient education/ counselling is needed as many of them lack drug compliances and thus medication adherence. This may be due to the lack of knowledge of patients on disease and medications thus it can be improved through proper patient education / counseling by clinical pharmacists.

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