EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

DIABETES MELLITUS AND TREATMENT PATTERN OF ASSOCIATED DISORDERS: A PRESCRIPTION BASED STUDY IN MORADABAD CITY

Mohammad Abid[1]*, Kapil Kumar[1], Renu Rani[1], Ashok Kumar Gosh[2], Syed Salman Ali, Najam Ali Khan[1]

[1]Department of Pharmacology and Clinical Research, School of Pharmaceutical Sciences, IFTM University, Moradabad-244102, U.P., India.
[2]Department of Phytochemistry, School of Pharmaceutical Sciences, IFTM University, Moradabad-244102, U.P., India.

*Corresponding Author: Mohammad Abid

Department of Pharmacology and Clinical Research, School of Pharmaceutical Sciences, IFTM University, Moradabad-244102, U.P., India.

ABSTRACT

Diabetes mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels. The main aims of the study for analyze the prescriptions of diabetic patients to find out the cases of associated disorders and their treatment pattern. It is a chronic disorder of carbohydrate, fat and protein metabolism. A defective or deficient insulin secretary response, which leads to impaired carbohydrate use, is a characteristic feature of DM.

KEYWORDS: Diabetes mellitus, hyperglycemia, prescriptions and metabolism etc.

INTRODUCTION

Diabetes mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels. Patients with diabetes have an increased incidence of atherosclerotic cardiovascular, peripheral arterial, and cerebrovascular disease. Hypertension and abnormalities of lipoprotein metabolism are often found in people with diabetes.[1]

It is a group of metabolic disorders characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both overt diabetes affects 2-3% of the total world population.[2] It is a chronic disorder of carbohydrate, fat and protein metabolism.[3] A defective or deficient insulin secretary response, which leads to impaired carbohydrate use, is a characteristic feature of DM[3,4]

There are different types of diabetes:[1]
I. Type 1 diabetes (b-cell destruction, usually leading to absolute insulin deficiency)
A. Immune mediated
B. Idiopathic

II. Type 2 diabetes (may range from predominantly insulin resistance with relative insulin deficiency to a predominantly secretory defect with insulin resistance)

III. Other specific types
A. Genetic defects of b-cell function
B. Genetic defects in insulin action
C. Diseases of the exocrine pancreas
D. Endocrinopathies
E. Drug or chemical induced
F. Infections
G. Uncommon forms of immune-mediated diabetes
H. Other genetic syndromes sometimes associated with diabetes

IV. Gestational diabetes mellitus[1]

According to a WHO survey, India will soon be the world's diabetes capital and the statistics are frightening. The onset of the disease among Indians is about 10 years lower than Europeans and Americans that is at age 44-45 years.[5] The number of diabetics is about 3 crores in India. By 2025, the figure will reach a staggering 6 crores figure in the country.[6] Unfortunately, only 25 percent of the cases are detected presently. And out of this only 15-20 percent take regular treatment.[7] Most Indians neglect treatment of the disease, as they believe it's an expensive process. But here's some new light on this issue. Experts say it's more expensive not to treat this lifestyle disease.[8]

The main aims of the study for analyze the prescriptions of diabetic patients to find out the cases of associated disorders and their treatment pattern.

MATERIALS AND METHODS

The intended work can be divided into the following phases.

Phase1. To collect randomly the prescriptions of Diabetic patients from doctors belongs to Moradabad city.

Phase2. To divide the prescriptions into various groups and to analyses the prescriptions in the following manner.

1. Common Findings
2. Age and gender wise groups of diabetes patients
3. Analysis of prescription in diabetic patient
4. Analysis of prescription showing with other disease.
5. DM and different categories of drugs

RESULTS

1. Common Findings

A total number of 500 prescriptions were collected at random.

2. Age and gender wise groups of diabetes patients

Out of the 500 prescriptions of diabetic patients, it was found evident that people of age group 51 to 60 years were found to be the major sufferers of this metabolic disorder also; it was observed that DM has more males (63%) as sufferers than the females (37%).

Table.1 Study of age and gender wise groups of diabetes patients.

Age Group	Males	Females
21-30	13	10
31-40	15	12
41-50	37	54
51-60	240	18
61-70	67	66
>70	50	1
TOTAL (Sex wise)	339(63 %)	161(37%)

3. Analysis of prescription in diabetic patient

Total no of prescriptions collected = 500.
No. of drugs prescribed = approximately 2500 drugs.

4. Analysis of prescription showing with other diseases

While analyzing the prescriptions showing incidence with the other diseases, it was clear that hypertension is the most prevalent disease which is associated with diabetes (41.2%), next being depression (30%).

Table. 2 Analysis of prescription showing with other diseases:

Category	No. of cases	% Age
Only DM	57	11%
Depression & DM	153	30%
Hypertension + DM	206	41.2%
Depression + Hypertension + DM	94	19.%

5. DM and different categories of drugs
i. DM and drugs for hypertension

Among these categories of drugs, it was found that Ca^{2+} Channel Blockers, Diuretics and Alpha Blockers respectively frequently prescribed drugs.

ii. Table. 3 DM and drugs for hypertension

S.No	Drug Class	No.	%age
A	Ca^{2+} Channel Blockers	111	39.8%
B	Diuretics	78	27.9%
C	Alpha Blockers	63	22.7%
D	ACE inhibitors	12	14.7%
E	A Blockers	6	2.15%
F	Misc. Group	9	13.23%

iii. DM and GIT disorders drugs.

DM is directly related with GIT disorder. Proton pump inhibitor was more frequently prescribed drugs.

Table 4. DM and GIT disorders drugs.

S.No.	Drug Class	Number	% Age
1.	Proton pump inhibitor	257	64.3
2.	H_2 Blocker	347	24.5
3.	Antacid	46	10.7

iv. DM and Anti infective drugs

In the prescriptions of diabetic patients, frequently anti-infective prescribing drugs are as follows, Quinolones (36.5%) and cephalosporins (28.7%) were the most commonly used category while metronidazole was very frequently prescribed (13.4%).

Table: 5 DM and Anti infective drugs.

S.No.	Drug Class	Number	% Age
1.	Quinolones	42	36.5
2.	Cephalosporin	53	28.7
3.	Metronidazole	115	13.4
4.	Misc Group	25	21.7

v. The preferred medications

The hypoglycemic drugs are more frequent than insulin.

Table: 6 The preferred medications.

S.No.	Drug Class	Number	% Age
1.	Insulin	93	18.6
2.	Oral hypoglycemic drugs	407	81.4

vi. Percentage of different classes of drugs used

Out of 2500 drugs, it was observed that Ca^{2+} channel blockers (18.38%) was the most commonly found category of drugs accompanying DM.

Table: 7 Percentage of different classes of drugs used.

Drug Class	%age
Ca^{2+} Channel blockers	18.38
Diuretics	12.9
α blocker	10.43
ACE inhibitor	1.98
β blocker	.99
Misc Group	1.49
Quinolones	6.95
Cephalosporins	5.46
Metronidazole	2.48
Misc Group	4.14
Proton pump inhibitor	9.43
H_2 blockers	6.96
Misc Group	0.99
Insulin	15.4
Oral hypoglycemic agents	35.98

DISCUSSION

The total 500 prescription of diabetic patients were collected and total number drugs prescribed in prescriptions were found to be approx 2500.

Out of the prescriptions of diabetic patients, it was found evident that people of age group 51 to 60 years were found to be the major sufferers of this metabolic disorder also; it was observed that DM has more males (63%) as sufferers than the females (37%). The prevalence of DM increases with age of population. In developing countries, the largest number of people with diabetes is in the age group 45 to 64 years, while in developed the largest number is found in those aged 65 years and over.[2]

It was reported that why men may be more likely to develop type 2 diabetes than women, in a new study it was found men are biologically more susceptible and need to gain far less weight than women to develop the condition. In the study, Scottish researchers examined the records of 95,057 men and women with type 2 diabetes (a condition caused by too much glucose, a type of sugar, in the blood), looking at their ages and body mass index (BMI) scores at the time of diagnosis. A clear trend was found in their results, with men developing type 2 diabetes at a lower BMI than women of a similar age.[9]

While analyzing the prescriptions showing incidence with the other diseases, it was clear that hypertension is the most prevalent disease which is associated with diabetes (41.2%), next being depression (30%).

It is reported in the study that the prevalence of hypertension is estimated at about 30% of the adult population in developed countries and is predicted to increase by almost 60% in the next 2 decades.[10,11] More than 75% of adults with diabetes have blood pressure are using antihypertensive medication.[12] because of major nephropathy and future declines in kidney function.[13] In

contrast, hypertension is already evident in most patients with type 2 diabetes at the time of diagnosis. Mortality is increased 7.2-fold when hypertension is present in patients with diabetes.[12]

The main pharmacological drug classes involved with DM prescriptions were found to be GIT and related drugs (37.3%) followed by drugs for cardiovascular diseases (27.8%) and anti infectious diseases drugs for systemic use (10.32%).

Out of 2500 drugs prescribed for hypertension, most commonly used category of drugs were Ca^{++} channel blockers (39.8%), diuretics (27.9%) and alpha blockers (22.6). Rarely used categories of drugs were ACE inhibitors and B blockers.

The implications of hypertension on cardiovascular risk, however, are similar in both types of diabetes.[12] Diabetes is a major risk factor for cardiovascular disease and the most common cause of kidney failure in the Western world.[14] Moreover, cardiovascular mortality and morbidity is increased substantially in the presence of diabetes.[15]

Similarly, drugs for GIT disorders which were found in the prescriptions of Diabetic patients, the most commonly used category of drugs was proton pump inhibitors and H_2 blockers.

Gastrointestinal manifestations are frequently observed in diabetes mellitus and may occur in up to 76% of all diabetes patients.[16] They may be noted at the onset of diabetes mellitus, during an acute critical presentation such as ketoacidosis or may manifest after the diabetes has been present for several years. All organs of the GI tract from the mouth to the anus as well as the gallbladder, liver and pancreas may be involved.[17] Autonomic dysfunction secondary to neuropathy may lead to recurrent and permanent manifestations whereas metabolic aberrations such as ketoacidosis may cause transient clinical manifestations including nausea, abdominal pain, distention heartburn, chest pain, chest discomfort and peptic ulcer.[18] To treat the above these problems, proton pump inhibitors and H_2 blockers are used frequently.

In the prescriptions of diabetic patients, frequently anti-infective prescribing drugs are as follows, Quinolones (36.5%) and cephalosporins (28.7%) were the most commonly used category while metronidazole was very frequently prescribed (13.4%).

Infectious diseases are a significant source of morbidity and mortality in people with diabetes. Confirming the longstanding belief among clinicians that patients with diabetes are especially susceptible to infection, a large retrospective cohort study conducted in Canada documented that nearly half of all people with diabetes had at least one physician visit or hospitalization for an

infectious disease per year in each of 2 cohorts studied. In a study it was showed that patients with diabetes had an increased risk for several types of infections.[19]

The preferred medication for the Diabetic patients was found to be insulin (18.4.6%) while oral hypoglycemic drugs were prescribed to a higher frequency (81.6.4%).

ACKNOWLEDGEMENT

CONCLUSION

Diabetes mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels. In this study it was found that DM was found to be a syndrome not a disease, it can lead to open the door for happening the several types of studies like Hypertension, CVS disorders, GIT disorders and Kidney disorders etc. Prescription pattern indicated that drugs for others disorders (hypertension, GIT problems and kidney problems etc) are written including for DM.

REFRENCES

1. American diabetes association. Diagnosis and classification of diabetes mellitus. Diabetes care, 2012; 1(35): 64-71.
2. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. Diabetes care, 2004; 27(5): 1047-53.
3. Mokdad A, Bowman B, Ford E, Vinicor G, Marks J, Koplan J. The continuing epidemics of obesity and diabetes in the United States. JAMA, 2001; 286; 1195-2000.
4. Colagiuri S, Borch-Johnsen K, Glumer C, Vistisen D. therapeutically is an epidemic of type 2 diabetes.
5. Green A, Stovring H, Andersen M, Beck-nielsen H. The epidemic of type 2 diabetes is a statistical artefact.
6. Hallas J, Nissen A. Individualized drug utilization statistics. Analyzing a population's drug use from the perspective of individual users, Eur J Clin Pharmacol, 1994; 47(4): 367-72.
7. Gaist D, Sorensen H, Hallas J. The Danish prescription registries. Dan Med Bull. 1997; 44(4): 445-8.
8. Glynn RJ, Monane M, Gurwitz JH, Choodnovskiy I, Avorn J: Aging, comorbidity, and reduced rates of drug treatment for diabetes mellitus. J Clin Epidemiol, 1999; 52(8): 781-790.
9. http://www.nhs.uk/news/2011/10October/Pages/males-more-likely-to-get-diabetes.aspx
10. Kearney PM, Whelton M, Reynolds K. Global burden of hypertension: analysis of worldwide data. Lancet. 2005; 365(9455): 217–223.
11. Buse JB, Ginsberg HN, Bakris GL. Primary prevention of cardiovascular diseases in people with diabetes mellitus: a scientific statement from the American Heart Association and the American Diabetes Association. Circulation. 2007; 115(1): 114-126.
12. KDOQI. KDOQI clinical practice guidelines and clinical practice recommendations for diabetes and chronic kidney disease. Am J Kidney Dis., 2007; 49(2,2): S12-S154.
13. Sarafidis PA, Bakris GL. State of hypertension management in the united states: confluence of risk factors and the prevalence of resistant hypertension. J Clin Hypertens (Greenwich), 2008; 10: 130-139.
14. Nag S, Bilous R, Kelly W. All-cause and cardiovascular mortality in diabetic subjects increases significantly with reduced estimated glomerular filtration rate (eGFR): 10 years' data from the South Tees Diabetes Mortality study. Diabet Med. 2007; 24(1): 10-17.
15. Bakris GL. The importance of blood pressure control in the patient with diabetes. Am J Med., 2004; 116(5A): 30S-38S.
16. Feldman M, Schiller LR. Disorders of gastrointestinal motility associated with diabetes mellitus. Ann intern Med., 1983; 98: 378-84.
17. Goyal RK, Spiro HM. Gastrointestinal manifestations of diabetes mellitus. Med Clin North Am., 1971; 55: 1031-44.
18. Vinik A, Mitchell B. Clinical aspects of diabetic neuropathies. Diabetes Metab Rev., 1988; 4: 223-53.
19. Shah BR, Hux JE. Quantifying the risk of infectious diseases for people with diabetes. Diabetes Care, 2003; 26: 510-513.