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DRUG UTILIZATION AND EVALUATION PATTERN OF ANTI-DIABETIC DRUGS - A RESEARCH ARTICLE

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ABSTRACT

Diabetes Mellitus (DM) is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period. DUE Programs are carefully planned by the medical staff to include the drugs considered to be most problematic if not used correctly. By comparing actual drug use to predetermined standards, DUE can detect inappropriate and /or unnecessarily costly drug therapy. Study design involved Concurrent and Prospective case study of the patients who are under anti-diabetic's therapy associated with or without co-morbidities, which was approved by the Institutional Ethics Committee (IEC). Drug utilization of anti-Diabetics in various wards frequent use of sulfonylureas and biguanides in age group 50-70 was observed. The study described insulin and sulfonylureas were frequently prescribed drugs followed by biguanides.

KEYWORDS: Diabetes Mellitus, Drug Utilization and Evaluation, Hypoglycaemic Agents.

INTRODUCTION

Diabetes Mellitus (DM) is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period. Diabetes is a chronic disease affecting almost 6% of world's population.[9,11] It is associated with abnormal carbohydrate, protein and lipid metabolism. Diabetes, if uncontrolled can lead to several acute and chronic complications.[1]

Types of Diabetes Mellitus[2]

Type-1: DM results from the body failure to produce enough insulin. This form was previously referred to as "insulin-dependent diabetes mellitus" (IDDM), or "Juvenile diabetes". The cause is unknown.

Type-2: DM begins with insulin resistance, a condition in which cells fail to respond insulin properly. As the disease progress a lack of insulin may also develop this form was previously referred "non-insulin-dependent diabetes mellitus" (NIDDM) or "adult- onset diabetes "the primary cause is excessive body weight and not enough exercise.

Gestational diabetes: It is the third main form and occurs when pregnant women without a previous history of diabetes develop a high blood glucose level.

Clinical Manifestations

This includes[3]: Polyuria (increased thirst), Polydipsia (frequent urination), Polyphagia (increased hunger), Weight loss.

Symptoms which are specific to disease

Blurry vision, Headache, Fatigue, Slow healing of cuts, Itchy skin, Glycosuria.

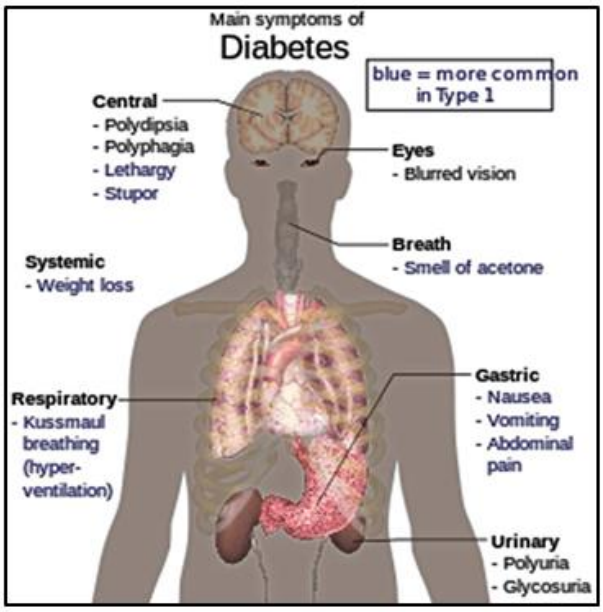

Fig. 1: Demonstrates Main Symptoms of DM.

Complications[10]

Damage to blood vessels, Cardio vascular disease, Diabetic retinopathy, Diabetic nephropathy, Chronic kidney disease, Diabetic neuropathy.

Diagnosis[4]

Oral glucose tolerance test, Fasting plasma glucose test, Single-blood sugar test, HbA1C. If left untreated, diabetes can cause many complications. Acute complications include

diabetic ketoacidosis, and non-ketonic hyperosmolar coma serious long term complication includes cardiovascular disease, stroke, kidney failure, foot ulcer and damage to eyes.

Management: Non-pharmacological and pharmacological treatment involves a healthy diet, physical exercise, smoking cessation, weight loss if obese, blood pressure controls and proper foot care are also most important with the disease. Type-1 Diabetes can be managed with insulin injections and Type-2 Diabetes can be treated with medication with or without insulin. Insulin and some oral medication can cause low blood sugar. Weight loss surgery in those who with obesity is an effective measure in those with Type-2 DM. Finally, Gestational diabetes usually resolves after birth of a baby.[5]

Table. 1: commonly prescribed oral hypoglycaemic agents.[6]

Class	Mechanisms of action	Limitations
Sulfonylurea's	Stimulates pancreas to release more insulin.	Hypoglycaemia May increase cardiovascular risk Contra-indicated in liver and renal dysfunction
Biguanide	Reduces glucose production by liver; Improves insulin sensitivity.	Lactic acidosis GI side effects
Alpha-glucosidase inhibitor	Reduces glucose absorption by gut.	GI side effects Requires frequent postprandial dosing
Thiazolidinedione	Stimulates nuclear PPAR- gamma receptor; Reduces insulin resistance.	Edema Contra-indicated in heart failure Weight gain

Drug Utilistion and Evaluation (DUE): DUE Programs are carefully planned by the medical staff to include the drugs considered to be most problematic if not used correctly. By comparing actual drug use to predetermined standards, DUE can detect inappropriate and /or unnecessarily costly drug therapy.[7]

Benefits of Due: DUE can play a key role in helping the health care systems understanding, interpret and improve the prescribing medications. DUE information may assist the health care systems and hospitals to design educational programs. That may improve prescribing and drug use.[8-10] The main aim of any DUE study is to promote rational drug use by: Reducing drug and health related treatment costs, improving health related quality of life, improving quality of medical treatment, Improving co- ordinate medical care.

RESULT

Table. 2: Gender wise distribution of drug utilization pattern of hypoglycaemic agents. (n=150).

Age Group	Total No. of Patients	No. of Male	No. of Female	% Distribution	% In Male	% In Female
<20	0	0	0	0	0	0
21-30	19	12	7	12.66%	8%	4.66%
31-40	31	21	10	20.66%	14%	6.66%
41-50	32	17	15	21.33%	11.33%	10%
51-60	32	20	12	21.33%	13.33%	8%
61-70	28	15	13	18.66%	10%	8.66%
>70	8	5	3	5.33%	3.33%	2%

Table. 3: Frequency of combination of drugs.

Drugs prescribed	Male	Female	Total	Percentage
Single Drug	49	46	95	63.33%
Two Drugs	32	11	43	28.66%
Three Drugs	8	4	12	8%
Total	89	61	150	100%

Table. 4: Age wise distribution of drug utilization pattern of hypoglycaemic agents. (n=150).

Age	Insulin	Alpha- glucosidaseinhibitors	Sulponyl Ureas	Biguanides	Thiazoldines	Insulin secrete analogues	Others	Tota l
<20	0	0	0	0	0	0	0	0
21-30	0	0	3	2	0	1	0	6
31-40	3	0	5	2	1	0	1	12
41-50	8	2	4	6	3	4	2	29
51-60	9	4	8	4	2	3	2	32
61-70	15	4	9	7	3	11	3	52
>70	4	1	2	6	2	3	1	19
Total	39	11	31	27	11	22	9	150
Percentage	26%	7.33%	20.66%	18%	7.33%	14.66%	6%	100 %

DISCUSSION

The result obtained in this study has given a wide knowledge regarding the drug utilization and evaluation of anti-diabetic drugs in concern with diabetes with or without co-morbidities. In demographic data per gender, among 150 patient's prescriptions selected there was significant difference in anti-Diabetics used in males and females. Whereas, according to age, in these patients was categorized as <20, 21-30,31-40,41-50 ,51-60 61-70, >70 and more than 80 in which more than 50 years where 21.33% was observed average. It was found that drug utilization of anti-Diabetic drugs used in between the age of 50-70.

While in case of frequency of combination drugs, among three categories of drugs ie., single, two, three drug therapy were analyzed and observed that the single drug therapy value was 63.33% and was used frequently when compared to two and three drug therapy. Finally, Anti-diabetic drugs prescribed in the present study prescribing pattern for anti-diabetic drugs and found that Biguanides and sulfonylureas is mostly prescribed at the age of 51-60.

CONCLUSION

The study came across various factors such as age and gender types of anti-diabetics used, mono therapy & multiple therapy, based on diabetes with or without co morbidities. Drug utilization of anti-Diabetics in various wards frequent use of sulfonylureas and biguanides in age group 50-70 was observed. The study described insulin and sulfonylureas were frequently prescribed drugs followed by biguanides. Several problems in drug use patterns have been reported. This includes use of irrational combinations, excessive prescription of multivitamins, use of antibiotics in viral infection, etc. Often, the chronically ill patients like the diabetic patients suffer from multiple diseases and hence are prescribed multiple drugs. Moreover, irrational can lead to an increase in the cost of drugs.

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