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EVALUATION OF PRESCRIPTION PATTERN OF ANTI DIABETIC DRUG AT VIMSAR (A TERTIARY CARE, HOSPITAL), BURLA

ASHOK KUMAR PANIGRAHI[1], B. RAY[2*] AND MANASRANJAN PATI[3]

[1]Department of Pharmacology, VIMSAR, Burla, Odisha, India.
[2]Department of Pharmacology, Gayatri College of Pharmacy, Sambalpur, Odisha, India.
[3]Department of Pharmacy Store, VIMSAR, Burla, Odisha, India.

AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Diabetes mellitus (DM), belongs to the elegance of metabolic sicknesses which the mainsymptom related to this disorder is the excessive sugar ranges in blood for a protracted period. It may be categorised to the world's principal sicknesses thinking about that influences excessive populace in earth and affords principal sorts I and II. Diabetes headaches include viable blindness, amputation of decrease limb, renal failure, and cardiac arrest or stroke. This evaluate summarizes the pathophysiology for each kinds of DM, the type of antidiabetic medicinal drugs in addition to destiny perspectives. Until now injectable medicinal drugs are greater regularly used which will acquire the proper remedy. Patients choose oral antidiabetic medicinal drugs given that are less complicated to be administered and for that reason researchers consciousness their research at this direction. This paintings additionally aimed to provide and compare viable oral formulations towards DM kind II.

Methodology: Data from 50 no of Patient with Diabetes on the Outpatient of VIMSAR,Burla changed into gathered in step with element Semistructure questionary. The Data encompass Demographic facts and Prescription survey Regarding Drug Prescription Patteren and Drug Utilisation Patteren.

Results and Discussion: In the existing Study amongst Participants the male percent changed into a great deal greater. More male patient. Metformin changed into the maximum famous and regularly prescribed drug for Patient coming to inpatient department. Beside this Sulfonylurea organization is the every other drug prescribed to massive no of Patient.

Conclusion: To acquire most reliable glycemic control, The efficacy of Antidiabetic drug changed into simplest 40% Satisfactory. Hence intensification of modern-day drug remedy in addition to making plans more than one drug remedy with changed way of life justify closer to a hit oral anti diabetic therapy.

Keywords: Diabetes; hyperglycemia; sulfonylurea; biguanide; metformin; teneligliptine; pioglitazone.

1. INTRODUCTION

Diabetes, epidemiology and pathophysiology Diabetes, epidemiology and pathophysiology Recently, it become recorded that best in 2012 as a minimum 1.five million deaths triggered from diabetes1. The terms "Diabetes" and "Mellitus" are derived from Greek language. "Diabetes" denotes "a

**Corresponding author: Email: crabiswa@gmail.com;*

passer through, a siphon" while the "Mellitus" means "sweet". It is thought that Greeks entitled it such way, because of the exaggerated urine proportions produced via way of means of diabetic sufferers which attracted flies andbees2,three. From the first actual defined case of DM 3000 years in the past via way of means of the historic Egyptians and Araetus of Cappadocia (81-133AD) to 1675 whilst British Thomas Willis rediscover the wonder of urine and blood of patients4,five, considering now massive development withinside the know-how for DM has been achieved. Some theories aid that economic6 and insurance7 reputation might play a first-rate position at the specific of DM (kind II). Moreover a current observe confirmed that race might additionally have an vital thing on DM prevalence (kind I and II). DM is a serious, persistent and complicated contamination characterised via way of means of hyperglycemia that resulted from the pancreatic β-cells generate poor insulin (a hormone that adjusts blood glucose) whilst the frame can't correctly custom the insulin or each of them1,9,10.World fitness business enterprise has classified DM because the 7thleading reason in USA whilst it become envisioned that 422 million adults gift diabetes in 2014, four instances better than the recorded instances in 19801. Clinicians additionally accept as true with that DM can be came about via way of means of the carbohydrates and fats life in each day food plan for the reason that starch digestion in mammals is done via way of means of a-amylase and a-glucosidase. Inhibition of starch digestive enzymes or glucose transporters can lessen glucose launch and absorption withinside the small intestine. This decrement should assist to control DM [1,2]. Although, DM is one of the maximum fitness disaster of the twenty first century the bulk of ministries and public fitness government hold being oblivious for the modern-day effect of this ailment and its complications. Table 1 summarizes the estimation diabetic sufferers at 2015 and 2040. In evolved international locations, about 87% to 91% of the recognized diabetic humans are envisioned to have kind II diabetes, 7% to 12% gift kind 1 diabetes whilst 1% to three% to produce other forms of diabetes. In beneathneath evolved and growing international locations the relative instances of kind I and kind II diabetes have now no longer been studied in extremely good detail. Nonetheless, it appears that evidently kind I diabetes is much less common than kind II diabetes, in addition to it's miles growing via way of means of almost3 ch 12 months globally. It has been correlated that during maximum evolved international locations, the more a part of DM instances in infants and juveniles are related to kind I diabetes while kind II diabetes is pronounced as a greater not unusualplace condition. Mostly, kind II diabetes presence has been improved along multiplied sociocultural alterations: getting older populations, growing humans dwelling in city areas, low bodily activity, expanded sugar intake in addition to low fruit and vegetable intake. The precise reason of DM is unsure till now. Nevertheless, scientists accept as true with that genes, environmental elements and different pathological situations together with autoimmune eradication of the pancreatic β-cells which initiate insulin deficiency and different abnormalities which reason resistance to insulin motion appears to contain withinside the improvement of the ailment. The fundamental signs and symptoms of DM marked hyperglycemia blended with polyuria, polydipsia, polyphagia additionally referred to as the3 P's symptoms and symptoms. The presence of the three P's should imply that the blood sugar stage is excessive. In kind I, three P's may be found in better charge whilst they may be evolved quickly. In kind the three symptoms and symptoms are almost undetectable and expand greater gradually. Not so often, weight loss, blurred imaginative and prescient in addition to susceptibility to infections can also be aroused via way of means of persistent hyperglycemia [3,2]. The maximum acute worry of out of control DM which might be threatening to the lifestyles is the hyperglycemia observed with ketoacidosis or the non ketotic hyperosmolar syndrome. Diabetic sufferers may additionally have excessive blood stress and anomaly of lipoprotein metabolism. Among different long-time period signs and symptoms, retinopathy with viable imaginative and prescient loss, nephropathy inducing kidney failure, peripheral neuropathy associated with the presence of foot lesions, amputations, and Charcot joints. Furthermore autonomic neuropathy producing gastrointestinal, genitourinary, and cardiovascular symptoms and symptoms and sexual disorder can coexist to diabetic sufferers. Finally, humans recognized with DM seem normally atherosclerotic cardiovascular, peripheral arterial, and cerebrovascular diseases [4].

1.1 Classification and Diagnosis of Diabetes

Three main types of DM are known type I associated with full insulin deficiency, type II-progressive insulin deficiency15 and gestational DM which is diagnosed in 2nd or 3rd semester of pregnancy. Currently, although type I cannot be prevented, type II is preventable with good health, exercising and healthy diet. Early diagnosis is the key in diabetes management. Nevertheless, type II have affected high population and lead to complications in several body parts, heart, nerves, eyes, kidney and so on. Diabetes falls into three below general categories:

1. Type I diabetes is as a result of β-cell destruction which customarily provoke

complete insulin insufficiency. It was formerly known as insulin-dependent, juvenile or childhood-onset diabetes and it is occasioned by an autoimmune reaction, in which the immune system invaded against the insulin-producing pancreatic beta cells. Type I diabetes is distinguished by deficient insulin production in the body. In such type of DM the patients require daily administration of insulin so as to normalize the glucose level in the blood. Have not taken the insulin, their life is being threatened and can be fatal. The reason of type IDM is not identified yet being presently not preventable. Albeit, the reasons for type I diabetes are still unclear, changes in environmental risk factors and/or viral infections may have an impact on the appearance of DM. Extreme urination and thirst, continuous hunger, weight loss, vision changes and fatigue are the main symptoms of this type of DM. More often than not, the number of people who diagnosed with type I diabetes is escalated.

2. Type II diabetes which earlier termed non-insulin-dependent or adult-onset diabetes, assumed to be a result from a continuous insulin secretory defect on the background of insulin resistance on account of the body's inefficient use of insulin. Type II diabetes is the most typical DM. In this type, the body is capable of producing insulin but becomes so resistant that the insulin is ineffective. By the time, insulin levels could subsequently turned out insufficient. The cause of high blood glucose levels are both the insulin resistance and deficiency. Given that the symptoms (coincidental to type I diabetes symptoms) are generally less noticeable or absent, the illness could be dismissed and be undiagnosed for numerous years, and not until complications have already ascended. For various years, type II DM was observed only in adults, nowadays it has started to be seen also in children. Until present the exact causes for the development of type II diabetes are unknown, some significant risk factors being pointed out. The most significant ones include: excess body weight, physical inactivity and poor nutrition .Other factors which impacted are ethnicity, family history of DM, past history of gestational diabetes and advancing age [2].
3. Gestational diabetes mellitus (GDM): is a type of DM determined in thesecond or third trimester of pregnancy that is not clearly overt diabetes. GDM is a provisional disorder that happens in pregnancy and brings enduring danger of type II diabetes2,18.Women with slightly elevated blood glucose levels are diagnosed as having gestational diabetes, whilst women with substantially elevated blood glucose levels are classified as having diabetes mellitus in pregnancy. GDM tends to arise from the 24th week of pregnancy. Screening by means of an oral glucose tolerance test is therefore recommended and must be conducted early in pregnancy for high risk women, and between the 24th and 28th week of pregnancy in all other women. Women with hyperglycemia diagnosed during pregnancy are at greater risk of adverse pregnancy outcomes such as: very high blood pressure and foetal macrosomia, with the vaginal birth being difficult and risky. In some cases, clinicians prescribe insulin or oral medication in order to control the blood glucose levels. Notwithstanding, gestational diabetes normally disappears after delivery but women who have been previously diagnosed are in danger of presenting GDM in subsequent pregnancies and type IIDM later in their life. In addition, infants beared by mothers with GDM also have a higher risk of developing type II diabetes during adolescence or early adulthood [5,6,7].

1.2 Diagnostic Tests for Diabetes Mellitus

DM could be set on diagnosis mainly formed on A1C criteria or plasma glucose criteria, the fasting plasma glucose (FPG) or the 2-h plasma glucose value after a 75-g oral glucose tolerance test (OGTT). The same diagnostics are utilized to screen for and diagnose DM as well as to detect individuals with prediabetes 9,10,14,18,19. The American Diabetes Association (ADA)/European Association for the Study of Diabetes (EASD) and the American Association of Clinical Endocrinologists (AACE) suggest an HbA1c level of b7.0% and ≤6.5%, respectively ,for decreasing the risk of diabetic compromises in most patients 20–22. Criteria in order to diagnose prediabetes and diabetes.

1.3 Complications of Diabetes Mellitus

DM might also additionally result in numerous headaches or can co-exist with different diseases. In normal scientific control of diabetic sufferers, docs conflict with diabetic headaches which might be very not unusualplace and are available in huge spectrum of manifestations. The headaches are divided in microvascular and macrovascular Themacrovascular, which might be extra severe, are coronary disorder, stroke and peripheral neuropathy. The microvascular are sneakier and in long-time period mayleadon macrovascular headaches are diabetic retinopathy,

diabetic nephropathy and diabetic foot. In this component numerous case reviews are gift the various severa located withinside the literature. Neonatal diabetes is a unprecedented shape of diabetes mellitus (DM) which would possibly takes place at some stage in the primary six months of little one's life. The bureaucracy everlasting and brief had been related to changes withinside the KCNJ11 and ABCC8 genes maximum often and withinside the GATA6 gene much less often. These mutations coexist with gastrointestinal and coronary heart abnormalities. Such is a record of a Caucasian male little one with a GATA6 mutation that advanced DM because of pancreatic hypoplasia, ventricular and atrial septal defect, an absent gallbladder and a proper inguinal hernia [8,9,10]. Study Area: The concern of the examine is the drug usage evaluation in Type-2 Diabetes sufferers. Designing a Hospital primarily based totally examine enabled to interview all of the humans withinside the hospital, who have been recognized to have Type-Diabetes. Drug usage is printed via way of means of World Health Organization (WHO) as a consider of the examine of systematic, Ongoing, criteria-primarily based totally assessment of drug use in order to assist certify that drug treatments are used correctly (on the person affected person level). If remedy is deemed to be inappropriate, intervention with company or sufferers can be crucial to optimize drug remedy is deemed to be inappropriate, interventions with companies or sufferers can be vital to optimize drug remedy.A DUE is drug or disorder - particular and may be established so one can determine the real method of prescribing, allotting or administering a drug (Indications, dose, drug interactions, etc.) DUE is similar to Drug usage evaluation (DUR) [11]. This examine performs a key position in serving carried out fitness care machine understand, interpret, examine and enhance the prescribing, management and use of medications. All the information relating the examine have been gathered and recorded in a in particular designed information series shape. Self-organized shape questionnaire or information series shape incorporate 5 parts- sufferers demography, affected person's disorder details, medicinal drug detail, drug associated troubles, drug compliance. All the variables for the examine have been evaluated. The gathered information have been very well screened to test the danger factors, prescribing pattern, Safety profiles of various era of Anti diabetic Drug, Drug compliance and Drug Related Problems. Systematic sampling become completed in diabetic sufferers after determine the pattern size. Population type (allage group, each male and female) conditions. Data have been gathered in a well-designed Performa [12]. Methodology Aim To examine the drug usage evaluation in diabetic sufferers. Objective To determine the control of the diabetes sufferers and to examine the protection profiles of Anti diabetic drugs. To take a look at the drug compliance and drug associated troubles skilled at some stage in the direction of remedy. Plan of Work The examine of six months period become carry out withinside the multispecialty healthcare placing and is Distributed into 3 phases. Phase I: Site of practice Design of examine Criteria's of examine Literatures survey Followed and choice of Performa Designing information series shape Approval and permission from hospitalauthority Approval and registering the examine withinside the Institutional board Phase II: Data series Phase III: Analysis and assessment of gathered information's Interpretation of results Deriving conclusion Limitations if any Recommendations. Limitations if any Recommendations. Sources of Data All the applicable and vital information become gathered from the subsequent sources-sufferers consent shape,Patients information series shape, Patient recordfile/ prescription Treatment chart. Patient interview, Laboratory reviews. Also, Data become carried out from each affected person on the preliminary andconsequent out affected person's visits, additionally from beyond clinical statistics in addition to own circle of relatives members. Sample Size: The examine become led on a affected person pool of one hundred humans. Sampling Technique: Purposive sampling Study Duration: This examine become carried out for a duration of 6month. Study Criteria: Prospective observational examine. Study Site: This examine become carried out in each inside and out affected person placing of the neurology department atVeer SurendraSai Institute of Medical Science & Reasearch, Ayurvihar, Burla, Odisha.It is a close to approximately 1500 bededmultispeciality hospital [13]. Inclusion Criteria o Patients have been protected withinside the examine if o Patients affected by diabetes from anycause. o Both the genders with all age groups. o Willing to signal knowledgeable consent protected thestudy. Exclusion Criteria o Patients have been excluded withinside the examine if o Patients who do now no longer satisfy inclusion criteria. o Patients with incomplete information. o Pregnant and breast-feeding women [14,15].

2. METHOD OF DATA COLLECTION

Patients data such as the type of diabetes, number of drugs prescribed, drug-related problems and drug compliance if any during the therapy and whether drug monitoring was carried out or not was collected from various data sources case sheets, out-patient cards, laboratory reports etc. The follow–up was done based on the next appointment given by treating

clinician .The follow–up was done for a period of 6 months.

2.1 Statistical Methods

The data were subjected to descriptive statistical analysis using Microsoft Excel. Microsoft word, the collected data were cleared, categorized and analyzed using Microsoft Excel and the results were presented in excel have been used to generate bar graph, pie chart, histogram, and tables [16,17].

3. RESULTS AND DISCUSSION

The finding of the study were analyzed and arranged under the following sections:

- Distribution of sample according to demographic data.
- Distribution of sample according to disease data.
- Distribution of sample according to medication data.
- Distribution of sample according to drug related problems
- Factors influencing drug compliance.

3.1 Distribution of Sample According to Demographic Data

3.1.1 Distribution of sample according to age group distribution

The age of the sampled ranged from infants -80years with a mean age of 25. In Fig. 1 the Age classifications were made in view of age dispersion of test in order to have a base number under each class .The larger part of patients had a place with age gather 11-20 year (34%).Followed by the age assemble 21-30 year(24%), infants- 10(13%), 31-40 year (13%), 41-50 year(7%),51-60year(5%),61-70year(3%), 71-80(1%).

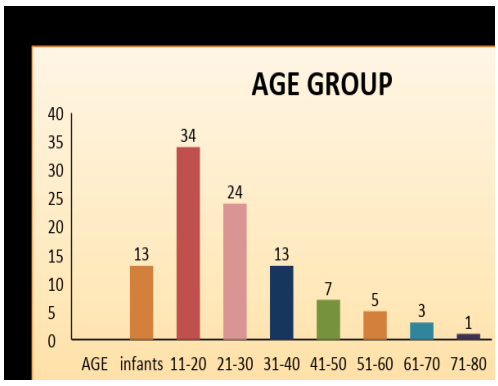

Fig. 1. Column diagram of the sample according to age group

3.1.2 Distribution of sample according to gender

This shows the distribution of patients according to gender. Out of 100 patients there were 56%male in sample and 44% female. In contrast to our results seen females were more than males in their study exposed to Anti diabetic drugs, It is however that males were more prone to diabetes than females which complements our result.

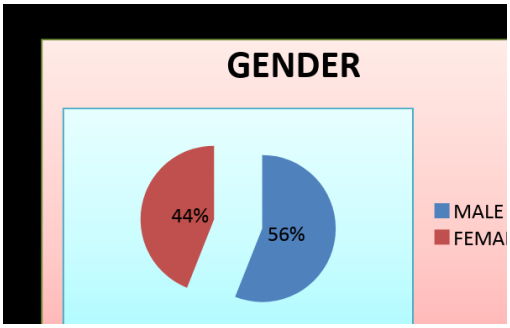

Fig. 2. Pie Diagram of distribution of sample according to gender

3.1.3 Distribution of sample of patients for extent of Anti diabetic drug utilization

This Table showed 9 different types of Antidiabetic. In100 prescriptions these drugs were prescribed 400times. Number of drug per prescription was 400/100 i.e. 4.00 .extent of utilization of individual drugs were Metformin42% followed by Glimeperide (1mg)5%, Glimeperide (2mg) 20%, Voglibose (0.2)10%, Voglibose (0.3)6%, Teneligliptin (20mg)10%, Vildagliptin3%, Pioglitazone3%, Siltagliptin1.5%.

Following was the utilization pattern of these drugs presented numerically. There are above 20 Anti diabetic drugs which are available for clinical use today. In our hospital, only 9 different Anti diabetic drugs were used, however. This study highlighted that Metformin (500mg) was the most commonly prescribed Anti diabetic drug [18].

In the present Study among Participants the male percentage was much more. More male patient Detected with elevated blood glucose level were prescribed the particular Anti diabetic drug according to their pattern of occurrence of Blood Glucose level. Average no of prescribed anti diabetic drug was 1.4.

Metformin was the most popular and frequently prescribed drug for Patient coming to inpatient department. Beside this Sulfonylurea group is the another drug prescribed to large no of Patient.

Table 1. Distribution of sample of patients for extent of Anti diabetic drug utilization

Oral anti diabetic drugs prescribed	No. of patients	Percentage
Metformin (500 mg)	70	42%
Glimeperide (1 mg)	38	5%
Glimeperide (2 mg)	65	20%
Voglibose (0.2 mg)	50	10%
Voglibose (0.3 mg)	35	6%
Teneligliptin (20 mg)	65	10
Vildagliptin	37	3%
Pioglitazone	25	3%
Sitagliptin	15	1.50%
Total	400	100%

The frequency of Prescription of Pioglitazone is less. Biguanide is the most common group of Prescribed Drug. Fixed dose combination of Biguanide and Sulfonylurea were prescribed commonly.

Monotherapy dominated over Polytherapy. Few patient prescribed Sitagliptin as per the Understanding of the Respective Specialist prescribed the drug. Only 40% patient on anti diabetic therapy had optimal glycemic control. It needed to modify the lifestyle to achieve optimal glycemic control and more benefit from Therapy.

4. CONCLUSION

Prescription pattern still modified but there was a shifting trend towards the use of insulin preparation towards management of Type-2 Diabetes mellitus. To achieve optimal glycemic control, The efficacy of Anti diabetic drug was only 40% Satisfactory. Hence intensification of current drug treatment as well as planning multiple drug treatment with modified lifestyle justify towards successful oral anti diabetic therapy.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).The protocol of the study is simple collection of Prescription from patient and Analysis.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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