A STUDY ON DRUG UTILIZATION PATTERN OF ORAL HYPOGLYCEMIC AGENTS IN TYPE - 2 DIABETIC PATIENTS OF A TERTIARY CARE TEACHING HOSPITAL

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ARTICLE INFO	ABSTRACT
Key Words Diabetes, Drug utilization pattern, Oral hypoglycemic agents, co-morbidities, prescribing pattern.	A Prospective observational study was conducted in Santhiram medical college and general hospital, Nandyal from July 2017 to December 2017, to evaluate the drug utilization pattern of oral hypoglycemic agents in type-2 diabetic patients of a tertiary care teaching hospital. Where clinical data are collected by using case sheets to evaluate GRBS levels, cost and drug therapy of diabetic patients. A total of 150 patients were evaluated for their glycemic levels, out of which 97 patients showed positive to type2 diabetes. The drug usage patterns of anti-diabetic drugs were summarized as count and percentage. A chi-square test was used to asses, the significance levels between drug therapy and GRBS levels. Among 97 diabetic patients, the incidence of diabetes was observed more in patients with age group of 51-60 (35.1%) and 61-70 (35.1%) years among them male (60.8%) are more predominant compared to female (39.2%). In this study concluded that, the most commonly prescribed oral hypoglycemic agents are Metformin in mono and combination therapy. More number of patients was found to be having co morbidities, notably hypertension which increases the cost burden on them due to poly-pharmacy. Finally, by providing patient counseling to diabetic patients, may screen out the risk and avoid the complications becoming worse, thereby reducing the cost burden on patients.

INTRODUCTION

The American Diabetes Association (ADA) defines Diabetes Mellitus is a group of metabolic diseases characterized by inappropriate hyperglycemia resulting from defects in Insulin secretion, insulin action or both[1]. The incidence of diabetes mellitus is upgrading every year, worldwide. In 2013,

approximately 382 million people were reported all over the world [2]. India has the highest number of diabetic patients in the world. It is speculated that environmental changes may be causing modification to the diabetes associated alleles. . T1DM may present at any age, but there is a sharp increase around the time of puberty and a

decline thereafter. Approximately 50-60% of patients with T1DM will present before 20 years of age[3]. Type 2 diabetes is characterized by insulin resistance (a condition in which cells lose their function to use insulin properly[4]. Poor glycemic control among T2DM may cause blindness, cardiovascular disease, kidney failure, lower limb amputation and several other long term complications that impact significantly on quality of life[5]. A wide range of oral hypoglycemics belongs to different classes of pharmacological classes likeSulfonylurea's, Meglitinide, Glucagon-like peptide-1(glp-1) receptor agonist, Dipeptidyl peptidase-4 (DPP-4) inhibitors, Biguanides, Thiazolidinediones, α-Glucosidase inhibitors, Amylin analogue, Dopamine –D2 receptor agonist and Sodium –glucose cotransport-2 (SGLT-2) inhibitors [6]. DUE is defined as an authorized, structured, ongoing review of physician prescribing DUE studies ensure whether the drugs are used appropriately, safely, effectively to improve patient health status[7]. Drug utilization studies are powerful exploratory tools to ascertain the role of drugs in the society. They create a sound socio medical and health economic basis for healthcare decision making [8&9]. It is used to perceive the knowledge regarding the usage of drugs. It can determine the patient population that are exposed to particular drug at a given period and used to know the scope of drug use at a precise moment and/or in a precise area (e.g. in a country, region, community or hospital)[10] Drug utilization Evaluation (DUE) has traditionally emphasized the importance of the right drug, right dose and right time [11]. Studies on drug utilization focus on the factors related to prescribing, dispensing, and administering of medication, its beneficial or adverse effects etc [8,12 &13]. DUS are particularly increasing if focused on the most frequently used and misused groups of therapeutic drugs, such as antibiotics, chemotherapeutic agents, or those that constitute important therapeutic innovations[14]. An increase in prevalence of Diabetes mellitus leads to major clinical, economic and social burden in India, thereupon it is called as "the diabetic capital of the world." The diabetic health-care cost is merging across the World. Pharmacoeconomic (PE) analysis is used to miniaturize these expenditures [15]. The aim of the study is to evaluate the drug utilization pattern of oral hypoglycemic agents in type-2 diabetic patients of a tertiary care teaching hospital by ensuring the pharmacotherapy meets the current standard of care, To know the patient knowledge regarding the drug usage and to evaluate the drug usage pattern of ant diabetic drugs in different age groups and gender. The ultimate need of the study is to assess whether drug therapy is rational or not and to evaluate the drug utilization pattern among patients in tertiary care hospital.

Methodology: Prospective Observational study was carried out over a period of 6 months from July 2017 to January 2018 in a tertiary care teaching hospital in Nandyal. Ethical clearance to conduct this study was obtained from the Institutional Human Ethical Committee of santhiram medical college and general hospital, Nandyal and strict confidentiality was assured for all the collected information.

Study Criteria:

Inclusion criteria: Known cases of DM with other co-morbidities who are receiving anti-diabetic drugs and admitted as in-patients, of both sex and age group of 18years and above were included.

Exclusion criteria: Patients with Gestational diabetes and age group of below 18 years were also excluded from the study.

Method of collection of data: The necessary information was collected by interviewing the patients using the following annexure.

Table No 1: Age wise distribution of diabetic patients:

Age (In years)	Total No. of patients	Percentage (%)
< 31-40	6	6.2
41-50	17	17.5
51-60	34	35.1
61-70	34	35.1
>70	6	6.2
Total	97	100

**Fig. No 1: Age wise distribution of diabetic patients:**
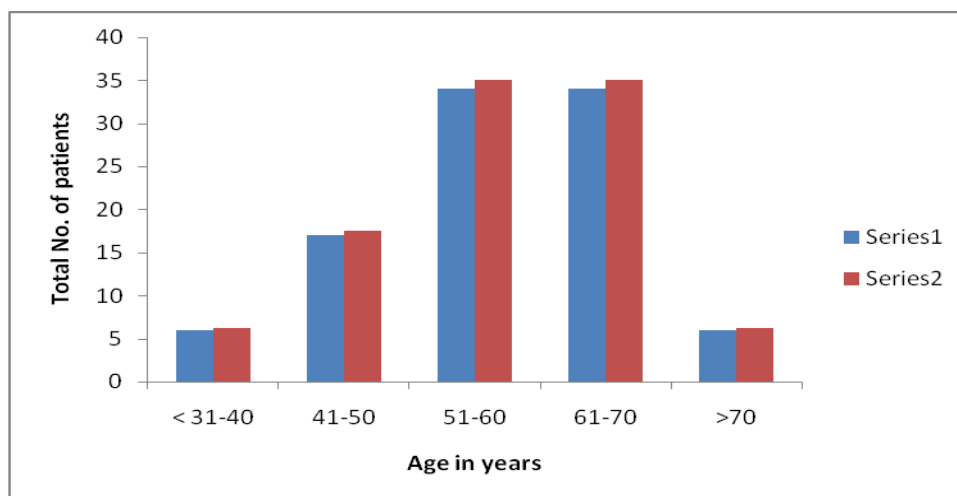
Among 97 diabetic patients in our study, the incidence of diabetes was observed more in patients with age group of 51-60 (35.1%) and 61-70 (35.1%) years followed by 41-50 (17.5%) years.

Table No: 2 GRBS distribution of diabetic patients

GRBS	Frequency	Percentage
150-200	24	24.7
201-250	17	17.5
251-300	33	34
301-350	10	10.3
351-400	4	4.1
401-450	3	3.1
451-500	2	2.1
501-550	2	2.1
551-600	2	2.1
Total	97	100

**Fig. No: 2 GRBS distribution of diabetic patients**
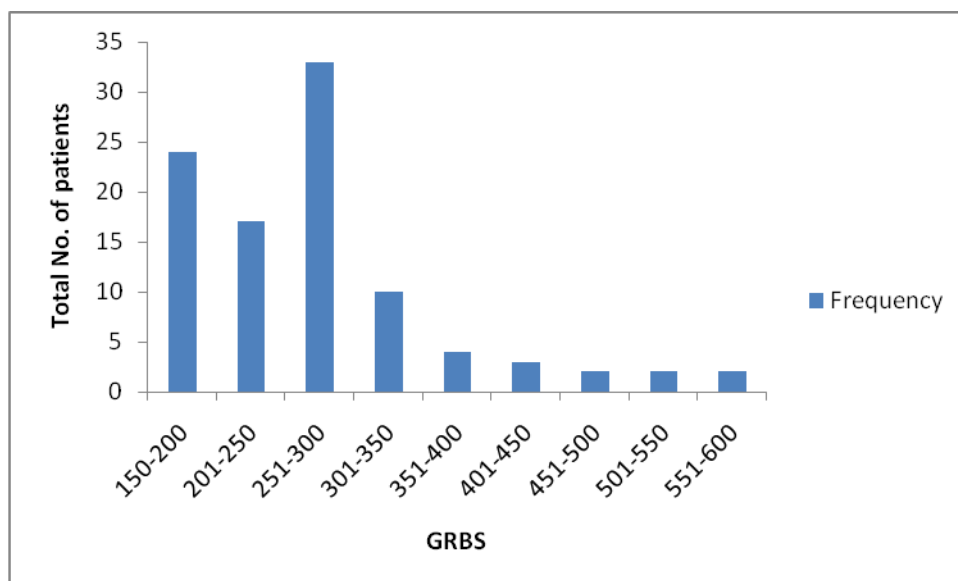
Among 97 diabetic patients, GRBS distribution ranging from 150 to 600 mg/dl, more number of patients are between 251-300 (34%) followed by 150-200 mg/dl (24.7%), 201-250(17.5%),301-350(10.3%),351-400 (4.1%) 401-450(3.1%),451-500(2.1%), 501-550 (2.1%),551-600 (2.1%).

Table No: 3 Pharmacotherapy distribution among diabetic patients

Pharmacotherapy	Frequency	Percentage
Single	11	11.3
Dual	22	22.7
Triple	2	2.1
Insulin	10	10.3
Insulin + Single	30	30.9
Insulin + Dual	21	21.6
Insulin + Triple	1	1
Total	97	100

Fig No: 3 Pharmacotherapy distribution among diabetic patients
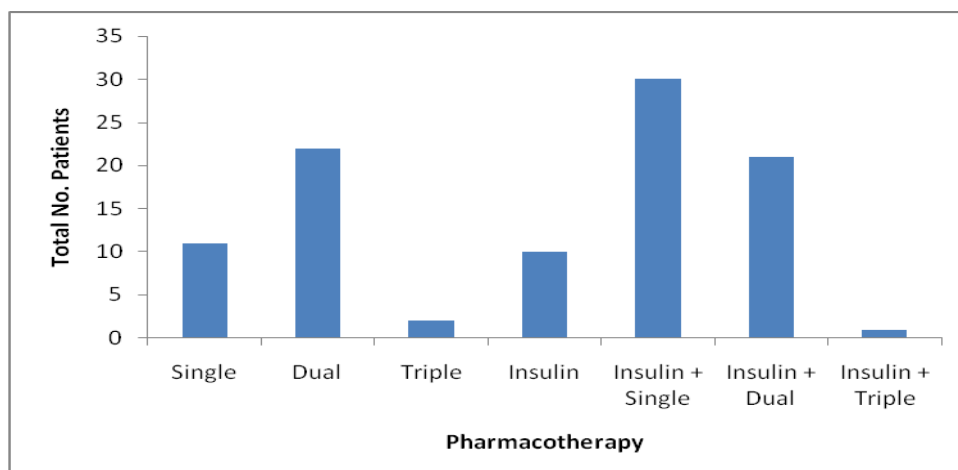
Among 97 diabetic patients, insulin with single therapy (30.9%) are more frequently prescribed followed by dual therapy (22.7%), insulin with dual therapy (21.6%),single therapy (11.3%), triple therapy (2.1%), insulin with triple therapy (1%).

Table No. 4 GRBS Vs Drug therapy

| GRBS		DRUGTHERAPY							TOTAL
		SINGLE	DUAL	TRIPLE	INSULIN	INSULIN +SINGLE	INSULIN +DUAL	INSULIN +TRIPLE	
150 - 200	Count	2	5	0	4	8	5	0	24
	% within GRBS	8.3%	20.8%	0.0%	16.7%	33.3%	20.8%	0.0%	100.0%
201 - 250	Count	2	1	1	1	7	5	0	17
	% within GRBS	11.8%	5.9%	5.9%	5.9%	41.2%	29.4%	0.0%	100.0%
251 - 300	Count	7	15	0	3	5	3	0	33
	% within GRBS	21.2%	45.5%	0.0%	9.1%	15.2%	9.1%	0.0%	100.0%
301 - 350	Count	0	0	1	1	3	5	0	10
	% within GRBS	0.0%	0.0%	10.0%	10.0%	30.0%	50.0%	0.0%	100.0%
351 - 400	Count	0	1	0	0	3	0	0	4
	% within GRBS	0.0%	25.0%	0.0%	0.0%	75.0%	0.0%	0.0%	100.0%
401 - 450	Count	0	0	0	0	2	1	0	3
	% within GRBS	0.0%	0.0%	0.0%	0.0%	66.7%	33.3%	0.0%	100.0%
451 - 500	Count	0	0	0	0	2	0	0	2
	% within GRBS	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
501 - 550	Count	0	0	0	0	0	2	0	2
	% within GRBS	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
551 - 600	Count	0	0	0	1	0	0	1	2
	% within GRBS	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	50.0%	100.0%
Total	Count	11	22	2	10	30	21	1	97
	% within GRBS	11.3%	22.7%	2.1%	10.3%	30.9%	21.6%	1.0%	100.0%

P tabular value = 0.05 p calculated value = 0.00

Where P refers to probability

As P calculated value is less than tabular value (0.00 < 0.05).
Hence there is a significant relation between GRBS values and Drug therapy.

Table. No.5 Cost of anti-diabetic therapy during the study

Cost in rupees	Frequency	Percentage
100-200	18	19.58
201-300	11	11.34
301-400	21	21.64
401-500	28	28.86
501-600	10	10.3
601-700	4	4.12
>700	4	4.12

Fig No.4 Cost of anti-diabetic therapy during the study
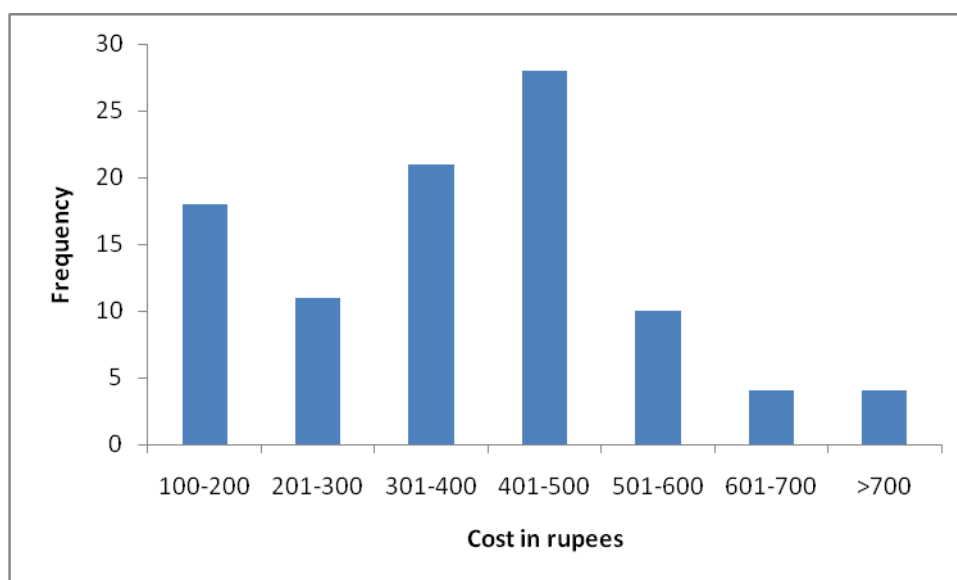
Among 97 diabetic cases, cost of anti-diabetic therapy ranging from 101 to more than 700 rupees most of the cases are between the costof 401-500 (28.86%).

Annexure- I (Patients demographic characteristics) Annexure-II (Diabetic health assessment questionnaire) Annexure-III (Patient information leaflets)

Statistical analysis: The results were analyzed and tabulated statistically by using SPSS (statistical package for social science) software version 22.0. Chi square test is used to compare the analyzed data and a value of p≤0.05n is taken as statistical significance.

Results and Discussion:

This prospective observational population based drug utilized study primarily explained the importance of demographic factors in drug utilization patterns of oral hypoglycemic agents and incidence of oral hypoglycemic agents in combination with insulin therapy. The analysis of results of our study prevalance emphasizes the male population as more susceptable thanfemale population. This study was compared to be showing similar results with that of Drug utilization study in patients with type 2 diabetes mellitus attending diabetic clinic of a teritiary care hospital in rural bengal conducted by Sekhar Mandal, Tamoghna Maiti et.al, in the year 2016. The study forecast middle and older aged population having incidence of diabetes which was previously discussed in Drug utilization pattern and effectiveness analysis in

diabetes mellitus at a teritiary care centre in eastern nepal by Premlatha Das, Balbadra Prasad Das et.al, conducted in the year 2011. GRBS, an undemanding, cost effective, painless, uncomplicated primary labouratory parameter considered nationaly and internationaly was opted in the study. Patients enrolled into the study were examined and GRBS levels were recorded. Out of all the recordwed levels most patients were observed to be at mean GRBS levels (251-300mg/dl) similar in most studies. After analysisng the results of ourn study, among all comorbidities hypertension proved its major impact on diabetic population who were enrolled into the study. The incidence parameter showed similarities when compared with study on drug utilization pattern of anti diabetic drugs among diabetic outpatients in a teritiary care hospital which was conducted by Sowmya Mary Alex, Umadevi et.al, in the year 2015. An uniformity and importance in prescribing and utilizing the glucose lowering agent in comparison to that of international guidelines considering Metformin as firstline therapy for type 2 diabetes was followed. The incidence of insulin with monotherapy in patients enrolled into the study was more compared to that of patients taking other monotherapeutic or combinational oral hypoglycemics. In most cases the used was Metformin, the study shows similar results with The utilization pattern of oral hypoglycemic agents for diabetes mellitus type 2 patients attending out patient department at the university hospital in Newdelhi conducted by Mohammed Shamsheer Alam, Mohammed Aqil et.al, in the year 2014. Estimating the cost analysis in the mean population having increased GRBS and middle and older population demonstrated increased cost burden in patients taking oral hypoglycemic agents and insulin therapy. This could be partly compared and explained. As the results when estimated needes an extensive study population and study duration which will be a limitation of the study.

CONCLUSION:

On the basis of our study, we concluded that the most commonly prescribed oral hypoglycemic agents was Metformin in mono and dual therapies and it is also prescribed with Insulin as a combination therapy. This study finally concludes that, by providing patient counseling to diabetic patients may screen out the Diabetic risk and may avoid the diabetic complications becoming worse, thereby reducing the cost burden on diabetic patients.

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