



## PRESCRIBING PATTERN OF ANTIDIABETIC DRUGS IN TYPE 2 DIABETES MELLITUS IN A RURAL TEACHING HOSPITAL IN SUB- HIMALYAN REGION

### Endocrinology

**Kailash Nath Sharma**

Professor medicine DRPGMCH Tanda Kangra HP

**Aman Sharma**

3<sup>rd</sup> year junior resident medicine RPGMCH TANDA Kangra HP

**Aradhna Sharma**

Assistant Professor Pharmacology Slbsmc Nerchowk MANDI HP

**Tarun sharma\***

Assistant Professor Medicine RPGMC Tanda at kangra HP \*Corresponding Author

### ABSTRACT

**Introduction:** The number of people with Type 2 DM is increasing in every country with 80% of people with diabetes mellitus (DM) living in low and middle income countries. The treatment options for Type 2 DM has increased over the years with the availability of the various classes of antidiabetic medications. The current objective of the study is to screen the prescription trends in Type 2 DM, assessing glycaemic control and studying demographic and anthropometric parameters in a rural setting.

**Material and Methods-** This observational study was conducted prospectively in department of Medicine DRPGMCH Tanda at Kangra. One hundred ninety patients of Type 2 DM over a period of two months (July and August, 2019) coming to medicine OPD were enrolled.

**Results:** Male to female ratio was 1.1:1. Minimum age of the patient was 30 yrs and maximum 88 yrs. BMI had no impact on glycaemic control in our study. Out of 190 patients, it was found that 56(29.5%) were on monotherapy and 136 (71.5%) patients were on combination therapy. Biguanides were the most commonly prescribed drug as monotherapy (22.8%) and in combination (88.4%). Sulphonylureas (SU) was the second preferred drug. In our study the third most common OHA was DPP4 I as monotherapy or in combination (32.6%). 62.6% patients on antidiabetic drugs had adequate glycaemic control while 37.4% patients had inadequate glycaemic control.

**Conclusion:** OHA still dominate the prescription pattern and biguanides are the most commonly prescribed drugs, but newer drugs like DPP4I have found a significant place in prescription pattern.

### KEYWORDS

prescribing pattern, antidiabetic drugs, oral hypoglycaemic agents

#### INTRODUCTION:

Type 2 diabetes mellitus (DM) is a major cause of morbidity and mortality throughout the world. Its prevalence is rising due to population growth, ageing, urbanisation, lack of physical activity and obesity. Unlike the western countries, where older population is most affected with Type 2 DM, in Asian countries, majority affected are young to middle aged adults. (1,2) Roughly 80% of diabetics are in developing countries, of which India and China account for majority of the patients (2). It is estimated that by 2030, India will have around 87 million people suffering from diabetes (3). Various studies in India indicate that more than 50% patients suffering from diabetes have poor glycaemic control (HbA1c > 8%) and may have diabetic vascular complications (4,5). The DCCT and UKPDS data showed that tight glycaemic control can significantly prevent the development of microvascular complications so adequate glycaemic control is the goal (6,7).

The currently used anti-diabetic drugs are very effective. However because of lack of patient compliance, clinical inertia, insulin resistance, lack of physical activity and poor dietary control leads to unsatisfactory glycaemic control (8,9). At present, Metformin is considered as first line therapy in patients with Type 2 DM. Sulphonyl ureas, particularly glimepiride and gliclazide, either as monotherapy or in combination with metformin, are still a common prescription in Type 2DM because of easy availability, cheaper cost and good glycaemic control in early years of Type 2DM. Thiazolidinediones and insulins are also commonly seen in prescription of Type 2DM. However with the introduction of Di-peptidyl peptidase 4 inhibitors (DPP4I), glucagon like peptide 1 receptor agonists (GLP1 receptor agonists) and sodium glucose transporter 2 inhibitors (SGLT2 inhibitors), prescription pattern in Type 2 DM is changing. Despite benefits of these newer anti-diabetic medications, these drugs are costly and may not be affordable to large economically deprived rural population. Therefore this study was carried out to find out the prescription pattern of physicians for anti-diabetic drugs in Type 2DM in a territory care teaching hospital, in rural setting in Sub- Himalayan region as no such study has been done in this region earlier.

#### MATERIAL AND METHODS-

This observational study was conducted prospectively in department of Medicine, DRPGMCH Tanda at Kangra, H.P, India. One hundred ninety patients of Type 2 DM over a period of two months (July and August 2019) coming to medicine OPD were enrolled.

#### Inclusion criteria –

- 1) Patients diagnosed as Type 2 DM (new or old)
- 2) Patients of both sexes
- 3) Patients with diabetes mellitus on OHA and/or Insulin

#### Exclusion criteria-

- 1) All type 1 Diabetic.
- 2) Indoor diabetic patients
- 3) Gestational diabetes.

Data was collected for all Type 2 DM patients attending OPD in the department of medicine after taking written consent. Demographic profile such as age of patient, gender and educational qualification were recorded in a Performa. Body mass index (BMI) of every patient was calculated. Patients were asked for duration of diabetes. Data was recorded for the class of drug patient was taking, whether on monotherapy or combined oral hypoglycaemic agents (OHA) or on insulin and its type (basal or human premix insulin 30/70). At the time of examination random blood sugar of patient was done by finger prick method by a glucometer and reading was recorded.

#### RESULTS:

In our study 91(47.9%) patients were male and 99(52.1%) were female. Mean age of patients was 57.38 +/- 10.78. Male to female ratio was 1.1:1. Minimum age of the patient was 30 years and maximum 88 yrs. More than 80% of the patients were in the age group between 41 to 70 yrs. Mean BMI was 23.54 kg/m<sup>2</sup>. Minimum BMI recorded was 17kg/m<sup>2</sup> and maximum was 40kg/m<sup>2</sup>. 86(51.6%) patients had a normal BMI. 12 (6.1%) were having low BMI (<18), 92(48.4%) had higher than normal BMI. 34(17.9%) patients were overweight, 53(27.9%) patients were obese and 5 (2.6%) patients were found to have morbid obesity. In our study 81.1% patients were educated up to twelfth standard and only 18.9% patients were having graduate or postgraduate degrees. Mean RBS was 194mg/dl. Maximum RBS recorded was 525mg/dl and minimum of 90mg/dl. Out of 190 patients RBS was less than 200mg/dl in 119(62.6%) and more than equal to 200mg/dl in 71(37.4%) patients. 45% of the patients had duration of diabetes less than 5 years and 22% had duration more than ten years. No difference in glycaemic control was observed in relation to gender or age. In our study it was found that with better educational qualification maximum number of patients achieved diabetic control although it was not found to be statistically significant. BMI had no impact on glycaemic control in our study. No relation was found between duration

of diabetes and sugar control. 53(27.8%) patients were on monotherapy with different class of drug and 134(72.2%) patients received more than one class of anti-diabetic drug. When SGLT2I were added as combination therapy, good control of glycaemic control was seen. Putting insulin glargine or premix 30/70 insulin as combination therapy showed poor glycaemic control.

On reviewing prescriptions of 190 patients (figure 1) it was found that 56(29.5%) were on monotherapy with different class of drugs, (biguanide 43(22.8%), SU1(.5%), DPP4I 7(3.7%), insulin glargine 2(1.1%)and premix 30/70 insulin 3(1.8%). 134 (70.5%) patients were on combination therapy. Out of 134 patients, 125(93.2%) received biguanide in combination with other OHA's. 9(6.8%) patients were without biguanides in combination therapy. 168(88.4%) patients were taking biguanides as monotherapy or in combination therapy. 70 (36.8%) patients received SU, out of which 1 (.5%) patient received SU as monotherapy and 69(36.3%) as combination therapy. 69 (36.3%) patients received DPP4I . Out of 69 patients 7(3.7%) received DPP4 as monotherapy and 62(32.6%) received DPP4I as combination therapy. SGLT2I were given to 8(4.2%) in combination with other OHA'S. 41 (21.6%) were on insulin therapy either as monotherapy or in combination. Only 3 (1.5%) patients were receiving TZD in combination therapy.

**Statistical Analysis :**

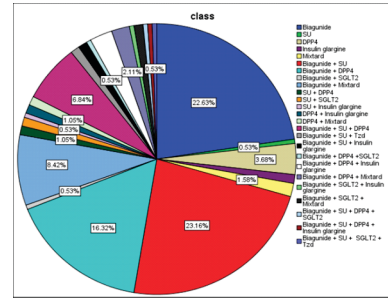
The data was analyzed as per SPSS version 16. Univariate vs odd's ratio was calculated. Parametric or nonparametric tests were used according to the distribution of variables. Differences in categorical variables were analysed using the Chi-square. Significant value of p was taken as <0.05.

**DISCUSSION:**

This study was conducted to find out the current prescription pattern of anti-diabetic drugs along with demographic, anthropometric and glycaemic levels in type 2 diabetes mellitus patients in a rural teaching institute. According to our results male (52.1%) patients were more than female(47.9%) which was different from study conducted by Mahmood M et al(10) in which males were 62.97%. In our study most patients were between age group of 41-70 years which was similar to other studies(11) . BMI was found to be similar in diabetic and nondiabetic patients. In our study 48.4% patients had a normal BMI and 48.4% patients had higher BMI as with other studies (12). Since Majority of patients in our study had a rural background and belonged to hilly areas, BMI was found to be normal in 50 % patients In our study, OHA's were commonly prescribed drugs. It was found that as the education status of patients improved, there was improvement in glycaemic control as well. It could be explained on the basis that patients with higher educational qualification had better understanding of the disease and could be more regular in taking medicines. Biguanides were the most commonly prescribed drug as monotherapy (22.8%) and in combination (88.4%). A study by Aggarwal A A etal (13) found biguanide as most common monotherapy ( 31.65%) which was similar to several other studies (14-17). This pattern was as per the ADA 2019 guidelines. SU was the second preferred drug either as monotherapy or in combination with biguanides (36.3%) which is similar to study by Aggarwal AA et al (34.14%) and other studies(18). In our study the third most common OHA was DPP4 I as monotherapy or in combination( 32.6%). SGLT 2 I were prescribed in combination in 4.2% patients. Insulin therapy accounted for 21.6% patients as monotherapy or in combination. Similar results were seen in previous Indian studies (15,18). 62.6% patients on anti-diabetic drugs had adequate glycaemic control while 37.4% patients had inadequate glycaemic control. Several other studies have documented glycaemic control between 50-86%(19-22) which is similar to our study. Most of the patients were on combination (69.5%) therapy rather than on monotherapy( 29.5%) in our study.

**CONCLUSION :**

The study highlights the use of biguanide as the preferred therapy but newer drugs like DPP4I are finding significant place in the prescription. SU still remain preferred drug in resource poor settings in view of low cost. DPP4 I had higher use in our study in view of the fact that cheaper drug like Teneligliptine is available in this class which is not the case with SGLT 2 I in whom cost could be a major drawback.



**Figure 1- showing prescription pattern of anti-diabetic drugs in Type 2 DM**

**Table showing Demographic and Anthropometric and glycaemic control**

Parameter	n	Percentage
<b>Educational qualification</b>		
No formal education	21	11.1%
Upto 5 <sup>th</sup>	39	20.5%
6 <sup>th</sup> to 12 <sup>th</sup>	94	49.5%
Above 12th	36	18.9%
<b>Duration of Diabetes</b>		
New	5	2.6%
<5 years	81	42.6%
5-10 years	62	32.6%
>10 years	42	22.1%
<b>BMI Kg/m2</b>		
<18.5	12	6.3%
18.5-22.9	86	45.3%
23-24.9	34	17.9%
25-34.9	53	27.9%
>35	5	2.6%
<b>Sex</b>		
Female	91	47.9%
Male	99	52.1%
<b>RBS</b>		
<200	119	62.6%
>200	71	37.4%
<b>AGE</b>		
30-40	9	4.7%
41-50	49	25.8%
51-60	55	28.9%
61-70	58	30.5%
71-80	18	9.5%
>80	1	.5%

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