



Original Article

Student Study

## PRESCRIBING TRENDS OF ANTIDIABETIC DRUGS AMONG TYPE 2 DIABETIC PATIENTS IN PUBLIC AND PRIVATE SECTOR HOSPITALS OF LAHORE

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Received on: 01-12-2016

Accepted on: 03-02-2017

### ABSTRACT

**Background:** Diabetes mellitus is a malfunction of pancreas where it does not produce enough insulin or the body has problem in utilizing insulin. It is a chronic enduring disease affecting a large unit of residents in Pakistan. Basic aim of our study was to observe and compare prescribing trends of antidiabetic drugs among public and private sector hospitals of Lahore. **Methods:** An observational study was conducted for 2 months in different hospitals of Lahore. 500 patients of diabetes mellitus were randomly recruited from public and private sector hospitals. A detailed questionnaire was designed and it was filled during face to face interview with patients. Collected data was analyzed and results were presented in the form of graphs and tables. **Results:** There was no significant difference observed in the prescribing trends of public and private sector hospitals. Patients were adopting life style interventions including dietary habits, physical activity, smoking cessation along with medications. The initial therapy was started with life style changes and only oral hypoglycemic agents (54.6%). Among them biguanides (27.5%) and Sulfonylureas (2.45%) were given as monotherapy and DPP4 inhibitors (44.55%) and glitazones (4.9%) were added as combination therapy with biguanides. Later on depending upon the duration and complications of disease the patients were shifted to insulin (45.4%) **Conclusion:** A good glycemic control was seen in patients who were taking premixed insulin and combination therapies of DPP4 inhibitors and biguanides in both sectors.

**Keywords:** Diabetes mellitus, oral hypoglycemic agents, insulin, biguanide, Sulfonylureas, DPP4- inhibitors.

Med. Channel 2017; 23(2) 77-81

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### INTRODUCTION

Diabetes mellitus (DM) is a chronic lifelong condition characterized by hyperglycemia resulting from impaired carbohydrate metabolism and a defects in insulin secretion or resistance to the action of insulin.<sup>[1]</sup> It is

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referred to as “non–insulin-dependent diabetes” or “adult-onset diabetes,”<sup>[2]</sup>Diabetes, if remain uncontrolled can lead to several acute and chronic complications such as macro vascular complications (coronary artery disease, peripheral arterial disease, and stroke) and microvascular complications (diabetic nephropathy, peripheral neuropathy, and retinopathy) <sup>[3]</sup>In Pakistan diabetes spreading day by day,if proper intervention and preventive strategies were not adopted the epidemic of diabetes will prove fatal <sup>[4]</sup>.

Diabetes mellitus can be managed by two ways either pharmacological or non-pharmacological.The general pharmacological approach for hyper glycaemia include insulin such as rapid acting insulin, short acting insulin, intermediate acting insulin, long acting insulin and pre mixed insulins <sup>[5]</sup>. Oral hypoglycemic agents include insulin sensitizers (Biguanides, Thiazolidinedione), secretagogues (first and second generation sulfonylureas, Glinides), alpha glucosidase inhibitors, DPP–IV inhibitors (Dipeptidyl peptidase–IV inhibitors), and others (Rapid release bromocriptine). <sup>[6]</sup> Oral antidiabetic drugs (OADs) can be used either alone or in combination with other OADs or insulin. Non-pharmacological therapies include lifestyle modification, herbal or homeopathic medication, yoga, regular exercise, dietary control <sup>[7]</sup>. Published trial

confirm that oral anti-diabetic drugs were advised in majority, which is easier method of drug administration. To reduce morbidity and mortality in diabetic patients, optimum glycemic control must be ensured not only by prescribing according to standard guidelines, but also by ensuring patients’ adherence to treatment plan. <sup>[8]</sup>

**MATERIALS AND METHODS**

A Descriptive observational study was conducted at Outdoor patient department (OPD) of various public and private sector hospitals of Lahore, Pakistan. The duration of study was 2 months (August 2016-September 2016) and 500 patients of diabetes mellitus aged between 20-70 years were randomly selected while patients having type 1 diabetes, gestational diabetes and any other endocrinological disorder were excluded A data collection form was designed covering aspects related to complications, alternative treatments ,life style changes , medications , side effects and compliance rate among type 2 diabetic patients and was filled during face to face interview with patients in public and private sector hospitals. Collected data was arranged and was analyzed on statistical package for social sciences (SPSS) version 17. Descriptive statistics were applied to calculate the frequencies and percentage of

**TABLE 1:**  
**Patient’s demographic, dietary habits,smoking and exercise**

Parameters	Variables	Frequency n=500 n= 250 (private) n=250 (public)	Percentage
Sex	Male	160	32%
	female	340	68%
Age	20-40 years	265	53%
	50-70 years	235	47%
Dietary habits	Vegetarian	313	62.6%
	Non vegetarian	25	5%
	both	162	32.4%
Smoking	smokers	180	36%
	Non smokers	320	64%
Exercise	Aerobic exercises	353	70.6%
	None	147	29.4%

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**TABLE 2:**  
**Percentage distribution of oral hypoglycemic agents and insulin according to their therapeutic class and duration of action respectively**

Parameters	Variables	Frequency n=500	Percentage
Therapy	Individual	159	31.8%
	Combination	341	68.2%
medications	Oral hypoglycemic agents (OHAg)	273	54.6%
	Insulin	80	16%
	OHAg + Insulin	147	29.4%
	Oral hypoglycemic agents		
agents	Biguanides	137	27.4%
	Sulfonylureas	13	2.6%
	Biguanide + Glitazones	25	5%
	Biguanide + DPP4	222	44.4%
	Biguanide + Sulfonylureas	103	20.6%
Insulin	Rapid + long acting	152	30.4%
	intermediate + short acting	219	43.8%
	(N+R) (premixed)		
	Short acting	62	12.4%
	Rapid acting	26	5.2%
	Intermediate acting	14	2.8%
	Long acting	27	5.4%

different variables and results was expressed in tables and figures.

### RESULT

As table 1 indicates, in our study, 32% patients were male and other 68% patients were female. 53% patients in our study were between 20 - 40 years. Among various lifestyle interventions, dietary habits, physical activity, and smoking cessation were adopted along with medications to control hyperglycemia. 62.6 % patients were pure vegetarian while 32.4% were on mixed diet. 64% patients were nonsmokers, aerobic exercises were mostly preferred by the patients (70.6%)

Table 2 indicates distribution of oral hypoglycemic agents and insulin among patients. 68.2% patients who were taking only oral hypoglycemic agents (OHAg) were prescribed with combination therapy because combination of two classes of OHAg produced better results as compared to individual therapy. Whereas

31.8% patients were taking individual therapy. In 54.6% patients the initial therapy was started with only OHAg in both sectors. However in 29.4% diabetic patients whose sugar levels were not controlled with OHAg were mostly prescribed with both the combination of OHAg and insulin. While 16% patients who failed to respond to this combination were only prescribed with insulin.

In both sectors the initial therapy was started with biguanide (metformin) in 27.4% patients. Later on the therapy was shifted to SFUs in 2.6% patients. In both sectors the combination of Biguanide and DPP4 inhibitors (sitagliptin and vildagliptin) was widely prescribed in 44.4 % patients. Combination of biguanide with SFUs (glimepiride, glibenclamide, and gliclazide) and glitazones were prescribed in 20.6% and 5% patients respectively. Combination of insulins was mostly prescribed in both sectors. Mostly combination of intermediate and short acting insulin (N+R) was

**TABLE 3:**  
**use of conventional treatment and level of satisfaction with the current treatment**

Parameter	variables	Frequency (n=500)	Percentage
Conventional treatment	Herbal	88	17.6%
	Homeopathic	134	26.8%
	none	278	55.6%
Level of satisfaction with current treatment	Pharmacological	371	74.2%
	Conventional	52	10.4%
	both	77	15.4%

Results are evaluated by considering each group as 100%.

prescribed to 43.8% patients.

Table 3 demonstrates that more than 50% patients were strictly against conventional treatment however herbal and homeopathic medicines were still in use. Due to immediate responses majority of patients (74.2%) were satisfied with pharmacological treatment.

### DISCUSSION

This study demonstrates, the high occurrence rate of diabetes in females than that of males. Studies conducted in Lahore KPK, USA and UK showed the similar results [3][9] [10].

In addition to use of medications, lifestyle changes, improved dietary habits, regular exercise, smoking cessation, had shown good impact on patient health. A previous study evaluated similarly that the lifestyle interventions were as effective as medicines in the management of diabetes [11].

It was reported in previous studies that aerobic exercise has a positive role in maintaining the glycemic level, increasing the insulin sensitivity and also improving cardiovascular risk factors with regard to T2DM. In the present study it was revealed that most of the patients in both sectors exercise regularly while some avoid it due to neuropathic pain [12][13]

In this study, in both sectors the initial therapy was started with monotherapy of biguanide and sulfonylureas. In case of non-effectiveness the monotherapy was shifted to combination therapy. DPP4 inhibitors were mostly given in combination with biguanides. A good glycemic control was seen in patients who were taking dual therapy. Previous trials compared the effectiveness of dual therapy with metformin alone,

and the results suggested that that overall each new class of noninsulin agents added to initial therapy maintains a good glycemic control [3][14]. A study revealed that DPP4 inhibitors were initiated in patients with longer duration of diabetes, the most commonly prescribed gliptin was Sitagliptin these results are similar to our study in which sitagliptin and vildagliptin were commonly prescribed among all gliptins [15]

Patients having elevated glucose level and poor diet control were shifted to insulin with or without oral hypoglycemic agents. Premixed insulin was mostly prescribed. Basal insulin was started as an initial therapy along with metformin. American diabetes association stated similar guidelines regarding insulin therapy. [4] According to a previous study combination of regular insulin and isophane insulin showed good glycemic control [15]

In previous studies Herbal medications were the most commonly used conventional treatments among patients for blood sugar control. In the present study most of the patients used herbal and homeopathic drugs and they were satisfied with the results [8]

### CONCLUSION

In this study high prevalence of type 2 diabetes was observed in local female population. Patients in both sectors were adopting life style interventions including dietary habits, physical activity, smoking cessation along with medications. In both sectors prescribing was done according to American diabetes association guidelines. The initial therapy was started with a monotherapy of metformin, SFUs and life style modification, followed by combination of oral

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hypoglycemic agents. Depending upon blood sugar levels, duration of disease, BMI, and HBA1c level, the monotherapy was shifted to dual therapy. DPP4 inhibitors, mostly sitagliptin and vildagliptin were prescribed in combination with metformin. In case of poor response to oral agents, premixed insulin was prescribed to achieve good glycemic control.

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**Authors contribution:**

\* Research work, data collection \*\* Data collection and compilation \*\*\* Supervision and review the manuscript

**Conflict of interest:** none