## Available online <u>www.jocpr.com</u>

# Journal of Chemical and Pharmaceutical Research, 2016, 8(5):186-189



**Research Article** 

ISSN: 0975-7384 CODEN(USA): JCPRC5

# Drug utilization pattern of antidiabetic drugs in diabetology outpatient department of a tertiary care teaching hospital

Arvinth A.<sup>1</sup>\*, N. S. Muthiah<sup>2</sup>, Suganya E.<sup>3</sup>, Sowmya P.<sup>4</sup> and Susshmitha R.<sup>5</sup>

<sup>1</sup>Post Graduate, Department of Pharmacology, Sree Balaji Medical College, Chennai
<sup>2</sup>Professor and HOD, Department of Pharmacology, Sree Balaji Medical College, Chennai
<sup>3</sup>Post Graduate, Department of Community Medicine, SVMCH & RC, Puducherry
<sup>4</sup>Post Graduate, Department of Pharmacology, Sree Balaji Medical College, Chennai
<sup>5</sup>Post Graduate, Department of Pharmacology, Sree Balaji Medical College, Chennai

# ABSTRACT

The Objective of the study is to analyze the prescriptive pattern of antidiabetic drugs according to World Health Organisation(WHO)drug use indicators in diabetology outpatient clinic of a Tertiary care teaching hospital. A prospective cross-sectional study conducted was conducted for 4 months in Diabetology clinic, Sree Balaji Medical College Hospital. Adult diabetic patients of either sex ranging from 18-75 years who visit the Diabetology outpatient department was included in the study. Drug use indicators and defined daily dosage (DDD) were calculated in this study. A total of 508 prescriptions were collected and the average number of drugs per prescription was 1.25. 70.02% of generics and 96.62% of essential drugs have been prescribed. Metformin is most commonly prescribed among all antidiabetic drugs. The average consulting time were 8.78 min and dispensing time were 40.17 sec. The DDD/1000/day for Metformin was the highest(314.6)and Inj. Insulatard was the lowest (20.32).It was concluded that the incidence of polypharmacy is very low and that the generic and essential drug prescription is high and Metformin is most commonly prescribed among antidiabetic drugs.

Keywords: Diabetes, WHO core indicators, ATC/DDD system, Anti-diabetic drugs.

## INTRODUCTION

Diabetes mellitus is described by World Health Organization (WHO) as "Metabolic disorder of multiple etiology characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action or both. The effects of diabetes mellitus include long-term damage, dysfunction and failure of various organs". Diabetes is a chronic disease, affecting nearly 6% of the world population[1]. The management of type-1 diabetes depends on insulin mainly, whereas the management of type-2 diabetes is mainly managed using oral hypoglycaemic agents (OHAs) [2]. Diabetes, if uncontrolled, leads to several acute and chronic complications [3]. Chronically ill patients like the diabetic patients suffer from multiple diseases and hence are prescribed multiple drugs. Moreover, irrational prescribing can lead to an increase in the cost of drug therapy, which may lead to non-adherence[4]. Drug utilization studies are powerful exploratory tools to determine the drug use pattern and to realize the role of drugs in society.A methodical drug utilization study was undertaken in the diabetology outpatient department of a tertiary care teaching hospital using World Health Organisation(WHO) drug use indicators.

### **EXPERIMENTAL SECTION**

The main aim of the study is to analyze the prescribing pattern of anti-diabetic drugs in a tertiary care teaching hospital. A prospective cross-sectional study conducted in Diabetology clinic, Sree Balaji Medical College Hospital for a period of 6 months after getting approval from Institutional Ethics committee. Adult diabetic patients of either sex ranging from 18-75 years who visit the Diabetology outpatient department was included in the study. Diabetic patients of both sex (males or females) of age below 18 and above 75 years, prescriptions from pregnant women and patients who has not taken medicines from our pharmacy were excluded. Once the consultation by the physician was over, patient's informed consent was obtained, the prescriptions will be copied, and the patients were interviewed as per the WHO guidelines[5]and the following indicators were determined.

# Core indicators:

## *i. Prescribing indicators:*

a) Average number of drugs per encounter will be calculated by dividing the total number of different drug products prescribed by the number of encounters surveyed.

b) Percentage of drugs prescribed by generic name will be determined by dividing the number of drugs prescribed by generic name by the total number of drugs prescribed, multiplied by 100.

c) Percentage of encounters with an antibiotic prescribed.

d) Percentage of encounters with an injection prescribed will be calculated by dividing the number of patient encounters during which an antibiotic or an injection prescribed by the total number of encounters surveyed, multiplied by 100.

e) Percentage of drugs prescribed from essential drug list will be determined by dividing the number of products prescribed from Essential drug list of the hospital by the total number of drugs prescribed, multiplied by 100.

### *ii. Patient Care Indicators:*

a) Average consultation time will be determined by dividing the total time for a series of consultations, by the actual number of consultations.

b) Average dispensing time will be calculated by dividing the total time for dispensing drugs to a series of patients, by the number of encounters.

c) Percentage of drugs actually dispensed will be worked out by dividing the number of drugs actually dispensed at the health facility by the total number of drugs prescribed, multiplied by 100.

d) Patients' knowledge of correct dosage will be found by dividing the number of patients who can adequately report the dosage schedule for all drugs, by the total number of patients interviewed, multiplied by 100.

#### *iii. Facility indicators:*

a) Availability of copy of EDL: By stating yes(or) no.

b) Availability of key drugs will be calculated by dividing the number of specified products actually in stock by the total number of drugs on the check list of essential drugs multiplied by 100.

#### **Complementary indicators:**

a) Percentage of patients treated without drugs will be calculated by dividing the number of consultations in which no drug is prescribed by the number of consultations surveyed.

b) Average drug cost per encounter will be determined by dividing the total cost of all drugs prescribed by the number of encounters surveyed.

c) Percentage of drug costs spent on injection will be determined by dividing the cost of injections prescribed by the total drug cost.

## DDD/1000/day:

The DDD/1000/day was calculated as follows,

DDD/1000/day =	Total number of dosage	Х	Strength of each		
	units prescribed		dosage unit	<b>X</b> 1000	

DDD X Duration of study X Total sample size

DDD was calculated as per guidelines for ATC classification and DDD assignment (2000) as given by WHO collaborating centre for drug statistics methodology, Oslo, Norway.

#### **RESULTS AND DISCUSSION**

A total of 508 prescriptions were collected. 52.6% were for females and 47.4% for males. The incidence of type 2 diabetes was 96.4%. 86.2% of patients received 2 drugs or less. For data stratification and analysis SPSS ver 22.0 (Statistical Package for Social Sciences Inc., USA) software package was used.

The key drug use indicators are given in Table 1. The percentage use of the various drugs prescribed in this clinic and the calculated DDD/1000/day are given in Table 3 and Figure 1.

#### Details of drug use indicators

#### Table 1.Core indicators

Prescribing indicators	
Average drugs prescribed	1.25
Generics	70.02%
Antibiotics	1%
Injections	12.16%
On Essential Drug List	96.62%
Patient care indicators	
Average consulting time(min)	8.78%
Average dispensing time(sec)	40.17%
Drugs dispensed	95.00%
Adequate knowledge	68.76%
Facility indicators	
Availability of Essential Drug List	Yes
Key drugs available	96.00%

#### Table 2.Complementary indicators:

Without drugs	3.68%
Average drug cost(Rs)/Prescription	2.16%
Drug cost on injections	63.14%

Table 3.The DDD/1000/day and the percentage of drugs prescribed at the diabetology OPD

Drug	Percentage of drugs prescribed	DDD/1000/day
Metformin	62	314.96
Glimipride	12	60.96
Inj. Mixtard	9	45.72
Gliblenclamide	7	35.56
Inj. Actrapid	6	30.48
Inj. Insulatard	4	20.32

Diabetes Mellitus is a chronic disease which requires a long term treatment. The average number of drugs per prescription is 1.25, when compared to previous records of 1.950[6],2.606[7], 3.035[8],4.078[9]from various specialty clinics in India. During the past years metformin has become the prime choice in the management of diabetes mellitus type 2 because of its effect on insulin resistance. The low figure probably reflects the fact that 96.4% of patients were type II diabetics and therefore the range of drugs prescribed and the number would be low. The percentage of generics and drug use from essential drug list are higher. The other area in which interventional measures are needed is patient education and knowledge. 47.24% of patients lacked adequate knowledge of dosage schedule, possibly due to communication error. Pharmacists can be urged to spend more time with dispensing since at the moment only 40.17sec are spent for each encounter. This simple measure would probably help patients understand their dosage schedule better. The non-drug prescriptions with "meal plan" describes the prescriber's adherence to the current trend in non-pharmacological management in specific categories. The injections cost 63.14% of the total showing that their inclusion in prescription leads to a higher costing which is inevitable in a diabetology clinic due to the prescribing of insulin. This is also confirmed by the high DDD of Insulin Mixtard. The

## Arvinth A. et al

main purpose of the DDD system is to provide a tool for presenting drug utilization statistics which allows measurement of drug consumption across therapeutic groups.



#### CONCLUSION

It may be concluded, that the incidence of polypharmacy is very low and that the generic and essential drug prescription is high and Metformin is most commonly prescribed among antidiabetic drugs. Improving awareness among the prescribers and patients knowledge on correct dosage would help to reduce the cost, to prevent drug-drug interaction and antibiotic resistance.

#### REFERENCES

[1] Mayor S. Br Med J 2006;333:1191.

[2]Cantrill JA, Wood J. Diabetes mellitus. In:Walker R, Edwards C, editors. Clinical pharmacology and therapeutic. 3rd ed. New York:Churchill Livingstone **2003**;657–77.

[3]Powers AC. Diabetes mellitus. In: BraunwaldE,Fauci AS, Kasper DL, Hauser SL, Longo DL, Jameson JL, editors. Harrison's principles of internal medicines. 15th ed. New York: McGraw-Hill Inc **2001**:**2109**–37.

[4]Upadhyay D K, Palaian S, Ravi Shankar P, Mishra P, Sah A K. *Journal of Clinical and Diagnostic Research* [serial online] **2007** August [cited:**2007** Aug 1]; 3:248-255.

[5]WHO. How to investigate drug use in health facilities:selected drug use indicators. Geneva, World HealthOrganization 1993. *WHO / DAP* **1993;1**:1-87.

[6]L. Sutharson, R.S. Hariharan, C. Vamsadhara: Indian Journal of Pharmacology 2003; 35: 237-240

[7]Maini R, Verma KK, Biswas NR, Agrawal SS. Indian J PhysiolPharmacol 2002;46:107-10.

[8]Biswas NR, Jindal S, Siddiquei MM, Maini R. Br J ClinPharmacol 2001;51:267 -9.

[9]Biswas NR, Biswas RS, Pal PS, Jain SK, Malhotra SP, Gupta A, et al. Indian J PhysiolPharmacol 2000;44:109-12.