

## A study on the impact of pharmacist interventions in anti-diabetic therapy

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### Abstract

**Aim & Objective:** The aim of this study was to evaluate the impact of clinical pharmacist services in the proper management of diabetes mellitus.

**Methods:** A retrospective observational study was conducted in 105 patients for a period of 1 year in Vivekananda Medical Care Hospital, Elayampalayam, Namakkal, Tamil Nadu. Approximately 105 patients were randomly selected after getting their consent informally. Total 50 patient records of age from 18-80 years, both male and female, diagnosed with Diabetes mellitus and on oral hypoglycemic therapy were included.

**Results:** Majority of ADRs were found in the age group of 40-50 and 60-70 years which accounted to be 2 (33.33%) while that of others was found to be 1(16.66%). Sulfonylureas and Biguaides were found to cause maximum number of ADRs 2 (33.33%) followed by dipeptidyl peptidase -4 inhibitors and injections 1 (16.66%). Causality assessment showed majority of cases to be probable 3(50.02%), followed by possible, highly probable and unlikely 1 (16.66%). 16 DRPs were found which comprised of 7 errors due to use of drug without indication, 8 due to drug -drug interaction and 1 drug – food interaction.

**Conclusion:** The study shows that the observations of the pharmacist help out in identifying certain adverse reactions that could be avoided or taken care in a proper manner. The Pharmacists' interventions may help the health care team to provide a rationale patient care and good patient compliance.

**Keywords:** ADR monitoring, pharmacist intervention, diabetes mellitus, drug related problems

### Introduction

The incidence of type 2DM varies substantially from one geographical region to the other as a result of environmental and lifestyle risk factors<sup>[1]</sup>. It is predicted that the prevalence of DM in adults of which type 2 DM is becoming prominent will increase in the next two decades and much of the increase will occur in developing countries where the majority of patients are aged between 45 and 64 years. Type 2 DM is characterized by insulin insensitivity as a result of insulin resistance, declining insulin production and eventual pancreatic beta-cell failure<sup>[2, 3]</sup>. This leads to a decreased transport into the liver, muscle cells, and fat cells. There is an increase in the breakdown of fat with hyperglycemia.

Type 2 DM is due primarily to lifestyle factors and genetics<sup>[4]</sup>. A number of lifestyle factors are known to be important to the development of type 2 DM. These are physical inactivity, sedentary lifestyle, cigarette smoking and generous consumption of alcohol<sup>[5]</sup>. Through lifestyle and diet modification, Studies have shown that there was significant reduction in the incidence of type 2 DM with a combination of maintenance of body mass index. Patients with type 2 DM should receive a medical nutrition evaluation; lifestyle recommendations should be tailored according to physical and functional ability.

Pharmacist intervention outcomes include health-related quality of life, patient satisfaction, medication appropriateness, adverse drug reactions and economics. Thus, this study was proposed to evaluate the impact of clinical pharmacist services in the proper management of diabetes

mellitus. This type of study is of particular importance because of most studies reporting medication errors and ADEs were in hospitalized patients, and with the growth of hospital medicine there is increased focus on interventions to improve the care of hospitalized patients<sup>[6]</sup>.

### Methodology

The proposed work was a Retrospective – Observational Study conducted at the department of General Medicine in a 300 bedded multi-specialty tertiary care teaching hospital with the approval of the institutional ethical committee (Ref. No. ---), over a period of 1 year (January 2019-July 2019).

Approximately 105 patients were randomly selected after getting their consent informally. Total 50 patient records of Age from 18-80 years, both male and female, diagnosed with Diabetes mellitus and on oral hypoglycemic therapy were included and exclusion criteria includes patients who belong to either of the categories like pregnant, with multi-drug treatment, with chronic renal failure, severely ill patients.

A separate data entry form incorporating inpatient details like demographics, medical/medication history, biochemical and other laboratory investigations and drug chart was designed and utilized for data entry. Patients were informed about the study using patient information format and obtained the written consent of either the patients or the caregivers.

### Results and Discussion

Intervention is the study and analysis of the distribution and determinants of health and disease conditions in defined

populations. Pharmacoeconomics is the scientific discipline that evaluates the clinical, economic and humanistic aspects of pharmaceutical products, services and programs

Endocrine is a pertaining to hormone and the glands that makes and secrete them into the blood stream through which they travel to affect distant organs. There are many different types of endocrine disorders includes Diabetes Mellitus, and we find out the adverse effects in anti-diabetic therapy.

According to our study 50 cases were collected and categorized as gender, age, clinical pharmacy activities, therapeutic class wise distribution of adverse drug reaction, severities of adverse drug reaction, causality assessment on adverse drug reaction.

From the 50 charts reviewed, 6 ADRs were found, out of which 4 (66.66%) were male and 2(33.3%) were female as detailed in Figure 1.

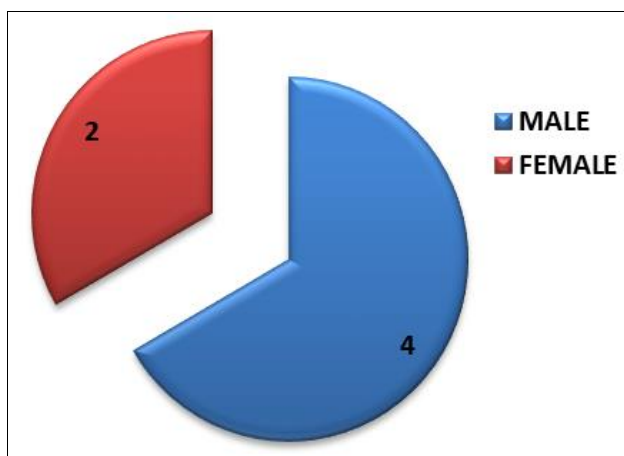


Fig 1: Gender Wise Distributions of Adrs

Majority of ADRs were found in the age group of 40-50 and 60-70 years which accounted to be 2 (33.33%) while that of others was found to be 1(16.66%). The details are given in fig 2.

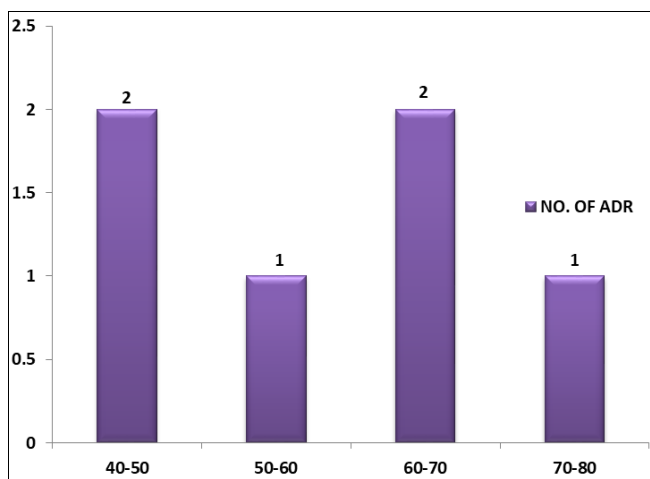


Fig 2: Age Wise Distribution of Adrs

During the study period from January 2019 to July 2019, medication charts of 50 diabetic patients were reviewed and

various activities like identifying drug related problems, patient counseling and answering drug information queries were carried out by the pharmacist as shown in Fig 3.

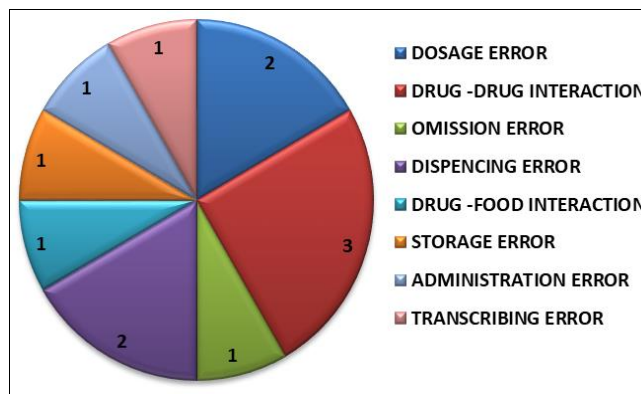


Fig 3: Clinical Pharmacy Activities

Sulfonylureas and Biguaides were found to cause maximum number of ADRs 2 (33.33%) followed by dipeptidyl peptidase -4 inhibitors and injections 1 (16.66%).

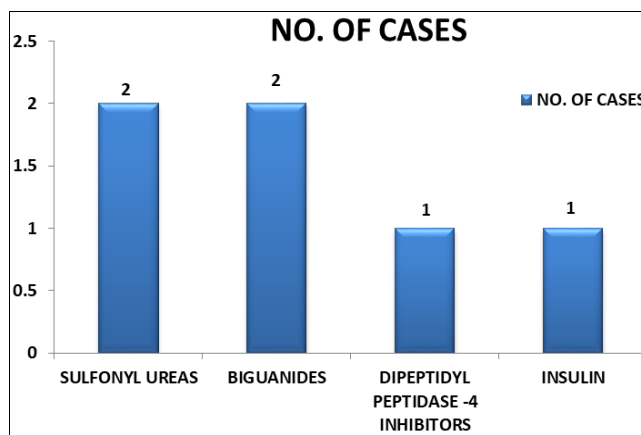


Fig 4: Therapeutic Class Wise Distribution of Adrs

Majority of cases 3 (50.01%) proved to be moderate as per Hartwig’s severity assessment, 1 (16.66%) were “Severe” and 2 (33.33%) were found to be “Mild” (fig 5).

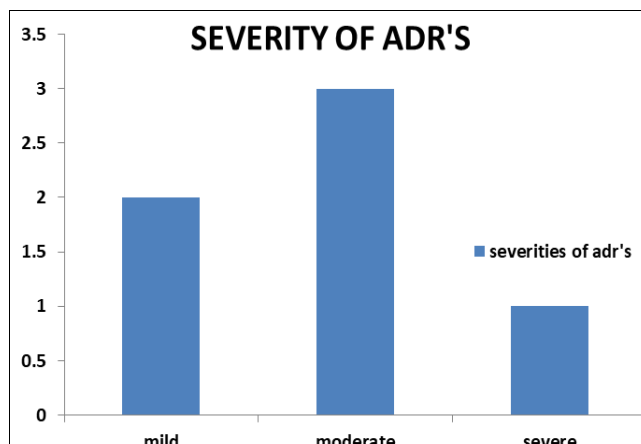


Fig 5: Severity of Adrs

Causality assessment showed majority of cases to be probable 3(50.02%), followed by possible, highly probable and unlikely 1 (16.66%) as presented in figure 6.

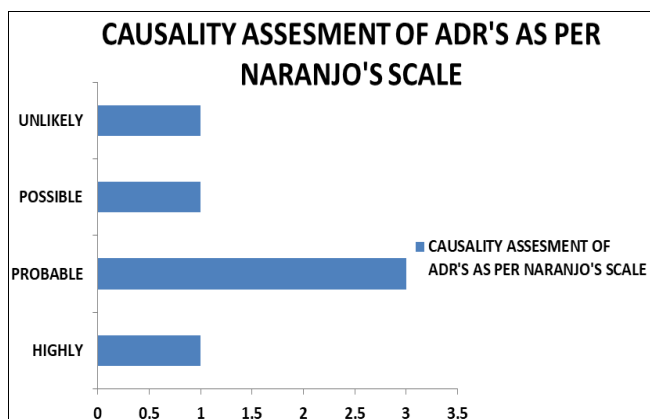


Fig 6: Casuality Assesment of Adrs

From the 50 medication charts reviewed, 16 DRPs were found which comprised of 7 errors due to use of drug without indication, 8 due to drug -drug interaction and 1 drug – food interaction as given in fig 7.

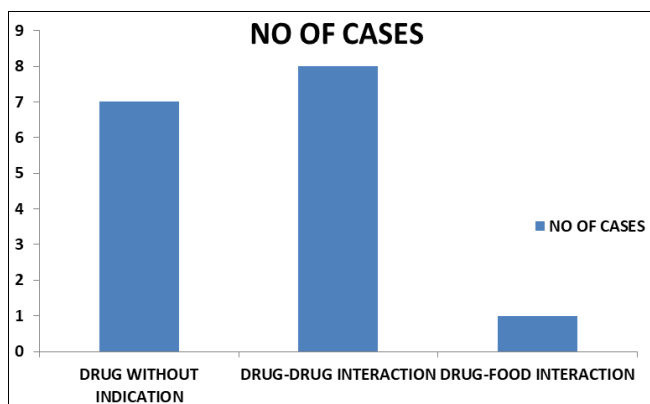


Fig 7: Drug Related Problems (DRPs)

Table 1

Drug	Interacting drug	Outcome
Metformin	Aspirin	Inhibit the pancreatic cancer cell growth and anti-apoptotic proteins.
Metformin	Furosemide	Lactic acidosis, slow heart rate.
Piogiltazo	Glimepride	Hypoglycemia
Glipizide	Ibuprofen	Hypoglycemia
Glipizide	Warfarin	Hypoglycemia
Glibenclamide	Atenolol	Increase the risk and Severity and hypoglycemia.
Insulin	Aspirin	Hypoglycemia, include palpitation, tremor, nausea, nervousness, rapid heartbeat.

During the study period, a total of 50 queries were answered

raised by physicians, nurses and patients/patient caretakers. The categorical distribution of drug information queries is shown in figure 8.

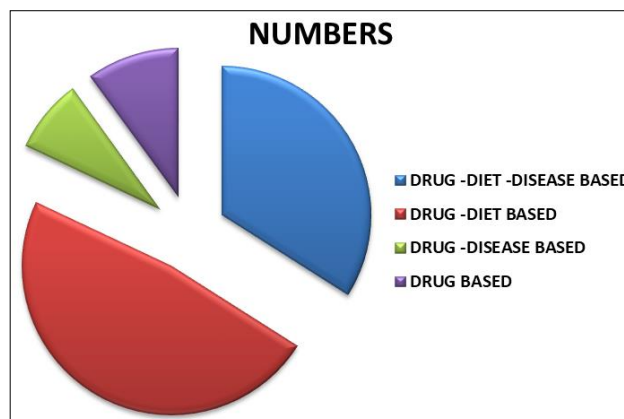


Fig 8: Categories of Drug Information Queries

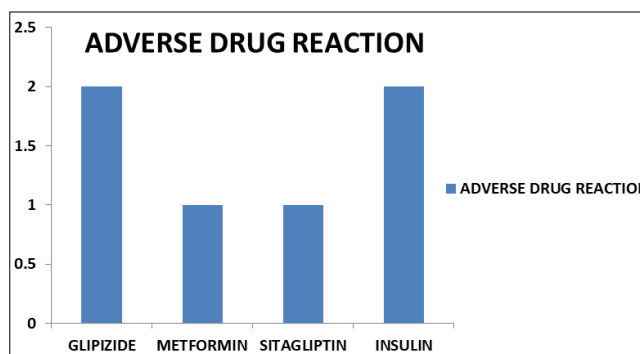


Fig 9: Classes of Drugs Produced Adverse Drugs Reactions

**Conclusion**

The study shows that the observations of the pharmacist help out in identifying certain adverse reactions that could be avoided or taken care in a proper manner. The Pharmacists’ interventions may help the health care team to provide a rationale patient care and good patient compliance. Counselling done by the clinical pharmacist will play a vital role in maintaining medication adherence and optimal control of the disease.

Thus, this study concludes that there is an enormous scope for the clinical pharmacist to provide better patient care as well better therapy outcome.

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