



Original article

Assessment of clinical pharmacist interventions in drug therapy in patients with diabetes mellitus in a tertiary care teaching hospital



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ABSTRACT

Aim: To assess the impact of clinical pharmacist interventions in drug therapy in hospitalized patients with diabetes mellitus.

Methods: A Prospective interventional study was carried out in the medicine wards of a tertiary care teaching hospital over a period of 10 months from September 2013 to June 2014. The drug therapy details of the patients were collected from inpatient case records in the respective clinical wards. Clinical pharmacist reviewed the drug therapy, identified the drug related problems during ward rounds and discussed with the physicians and suitable suggestions were provided which had been documented.

Results: A total of 189 drug therapy problems were identified from 151 patient case records. The number of drug related problems was found to be more in males than females. Drug related problems were commonly seen in patients aged between 61 and 70 years of age. The most common drug related problems was found to be drug use without indication (17.98%) followed by improper drug selection (16.40%). The most frequent suggestions by the clinical pharmacist were on cessation of drug (30.68%). The acceptance rate of suggestions and the changes in drug therapy was found to be high (58.20%). The majority of the level of significance of drug related problems was seen to have moderate significance in grade.

Conclusion: Involvement of clinical pharmacist as a member of healthcare team during ward rounds in hospitalized patients with diabetes mellitus helps in identification and prevention of drug related problems which will help to rationalize drug therapy, achieve better therapeutic outcomes and improved patient care.

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1. Introduction

Diabetes mellitus is one of the major health problems that are growing in epidemic proportion in many parts of the world and one of the main threats to human health in the 21st century [1]. The term diabetes mellitus refers to a metabolic disorder characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both. The dramatic increase in recent years and the expected increase in coming years in the number of new diabetes especially involving younger age groups and associated

cardiovascular complications will definitely place a challenge on all healthcare professionals [2].

The quality of use of medicines is a key factor in achieving positive outcomes. Evidence suggest that there is significant scope for improvement in the use of medicines for hospitalized patients as drug related problems are numerous contributing to negative healthy outcomes such as increased morbidity and mortality and reduced quality of life [3]. This is more so in patients with diabetes mellitus and proper selection of drug can also be challenging in their management and often optimal level of blood glucose is not reached during drug treatment. The reason could be the wrong choice of drug or dosage, or patient factors such as drug–disease interactions or adherence problems or any other drug related problems [4].

A drug-related problem can be defined as any event or circumstance involving the drug treatment, which interferes or potentially interferes with the patient, achieving an optimum

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outcome of medical care. Helper CD and Strand LM classified drug related problems into eight categories. They include untreated indication, inappropriate drug selection, sub-therapeutic dose, over dose, adverse drug reaction, failure to receive the drug, drug interaction and drug use without indication [5]. Many studies have shown that clinical pharmacists can effectively identify and prevent clinically significant drug-related problems and that physicians acknowledge and act on the clinical pharmacist's suggestions for intervention to the drug-related problems. A proactive rather than a reactive approach on the part of the pharmacists seems prudent for obtaining most benefit. This includes participation of pharmacists in the ward rounds – at the stage of ordering and prescribing – where all types of drug-related problems, including patient related factors, should be discussed. It impregates that a clinical pharmacist participation and intervention in health care can positively influence clinical practice [4,6].

Pharmacist intervention for this study is defined as an action by a clinical pharmacist that results in a change in the patients' therapeutic management [7].

A team based care has the potential to meet the complex need of many diabetic patients including the patient drug therapy. Though the positive impact of pharmacist delivered diabetes programs in the community setting has been well documented, the benefits of having a pharmacist on a multi-disciplinary diabetes team in a hospital has not been adequately studied. Studies that have looked at multifactorial interventions have suggested that patients with diabetes are best served when they are monitored and managed by highly skilled healthcare professionals trained on the current information about diabetes [8]. However, these trials did not include pharmacist as part of the team. Understanding the impact of having a pharmacist on such a team is important, especially patients with diabetes mellitus as they consume multiple medications for long term therapy and the fact that they are more likely to have multiple disease states and co morbid conditions where the chance of occurrence of drug related problems is very high. So in order to identify the drug related problems in patients with diabetes mellitus in our hospital the study has been carried out.

2. Aim of the study

- To identify the frequency and type of drug related problems in hospitalized patients with diabetes mellitus.
- To assess and quantify the impact of interventions carried out by clinical pharmacist in hospitalized patients with diabetes mellitus and their acceptance by clinicians.

3. Methods

The study was a prospective, interventional study carried out for a period of ten months in hospitalized patients with diabetes mellitus admitted under the general medicine department of Justice K S Hegde Charitable Hospital, Mangalore which is a 1200 bedded hospital with various specialty departments. Adult patients with diabetes mellitus above 18 years of age, prescribed with at least one anti-diabetic drug (Insulin or Oral hypoglycemic agents) were included in the study. Pregnancy induced diabetes mellitus patients and mentally challenged patients were excluded from the study. The intervening pharmacist was a researcher (clinical pharmacist). All the interventions made by the intervening pharmacist were preceded by the consultation with academic pharmacist (guide) and physician (co-guide). All the hospitalized patients with diabetes mellitus were reviewed by the researcher

(clinical pharmacist) and those who met the study criteria were enrolled into the study. All the necessary data including patient demographic details, past medical history, allergic status, laboratory investigation reports and drug therapy were collected and documented in the suitable designed data collection form as per need of the study. The researcher actively participated in the ward rounds on daily basis and routinely reviewed all aspects of patient drug therapy, past medical history, laboratory reports and clinicians notes from the date of admission till the discharge from the hospital and interviewed with the physician as well as patients when necessary. The complaints of the patients were analyzed in terms of drug therapy, part of the disease progression and in those cases where symptoms were attributes to drugs were reported as drug related problems. The patient drug treatment were reviewed for their appropriateness of drug indications, dosage, drug interactions, adverse drug reactions and contraindications by using the references like Lexi-comps drug information handbook, British National Formulary and Micromedex (drugdex) for any drug related problems. The identified drug related problems were then discussed with the co-guide (physician) and with the development of consensus interventions were conveyed to the respective physician along with the best possible approach to rectify drug related problems during the next ward round visits. The identified drug related problems were categorized as per the Hepler and Strand Classification and the pharmacist interventions were documented by the researcher in the designed documentation form. The acceptance level of physician for the particular intervention was also recorded as either accepted or not accepted according to the action of the treating physician. Similarly, the outcome of the intervention and the clinical significance of drug related problems were also noted by the researcher. All the data were later evaluated by the members of the team by using the descriptive statistics to assess the impact of clinical pharmacist intervention in patients with diabetes mellitus.

4. Results

A total of 174 cases were followed and reviewed in the medicine ward over ten month's period. Of the total 174 cases reviewed, 189 drug related problems has been identified from 151 patients. Out of the 151 patients, 81 (53.6%) were male and 70 (46.4%) were females. The average age of the patient was 59.56 ± 12 (mean \pm SD) years (range: 28 to 84 years). The age group of 61–70 years of patients had drug related problems compared to others ages group in the study. The average number of medicines per prescription was 10.41 ± 4 (mean \pm SD) medications. The demographic details of the study populations are summarized in Table 1.

Drug use without indication was the most common drug related problem, which accounted for 17.98% ($n \leq 34$) of the total drug related problems followed by improper drug selection 16.40% ($n \leq 31$) and adverse drug reaction 13.75% ($n \leq 26$). The different types of drug related problems observed in our study are summarized in Table 2.

The most frequent suggestions provided by the clinical pharmacist was cessation of drug 30.68% ($n \leq 58$) followed by change in drug dose 19.57% ($n \leq 37$). Addition of the drug and substitution of the drug accounted for 12.16% ($n \leq 23$), respectively, of the total interventions. The various intervention provided by the clinical pharmacist are summarized in the following Table 3.

Of the total drug related problems, the significance level 'moderate' was found to be high (77.24%) followed by significance level 'minor' (20.12%). The significance level of drug related problems are summarized in the following Table 4.

The results of clinical pharmacist recommendations concerning drug related problems are suggestions accepted and therapy changed 58.20% ($n \leq 110$), suggestions accepted and therapy not

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