

ASSESSMENT OF CLINICAL PHARMACIST INTERVENTION IN A TERTIARY CARE HOSPITAL IN CALICUT**Siraj Sundaran¹, G. Babu², Sudeep Balakrishnan³, Ram Manohar⁴, Ashik Hasan⁵, C. V. Krishnankutty⁶ and Japhia Saju^{7*}**¹Professor and Head of Department of Pharmacy Practice, Devaki Amma Memorial College of Pharmacy, Malappuram, Kerala, India.²Principal Devaki Amma Memorial College of Pharmacy, Malappuram, Kerala, India.^{3,4}Senior Consultant Neurologist, PVS hospital (P) Ltd, Calicut, India.⁵Consultant General Physician, PVS Hospital (P) Ltd, Calicut, India.⁶Paediatrician and Neonatologist, PVS Hospital (P) Ltd, Calicut, India.⁷Pharm D Intern, Devaki Amma Memorial College of Pharmacy, Malappuram, Kerala.***Corresponding Author: Japhia Saju**

Pharm D Intern Devaki Amma Memorial College of Pharmacy.

Article Received on 10/09/2020

Article Revised on 30/09/2020

Article Accepted on 20/10/2020

ABSTRACT

Clinical pharmacist intervention is an integral part of drug therapy. Identifying the drug related problems (DRPs) as well as implementing recommendations to resolve and prevent DRPs are important in clinical pharmacy activities. The aim of this study was to identify the various reactive interventions done by the clinical pharmacist in a tertiary care hospital in Calicut. A prospective clinical intervention method was used in this study. DRPs were identified and documented during ward rounds, case sheet review and analysis. A total of 73 prescriptions were intervened by the clinical pharmacist. DRPs identified were adverse drug reaction which accounted for 69.9%, followed by drug-drug interaction 13.7%, medication error 12.3%, untreated indication 1.4% and addition of drug 1.4%. Among the reactive interventions 21.3% were minor, 65.5% were moderate and 13.1% were major DRPs. The major reactive interventions provided by the clinical pharmacist involved drug discontinuation (46.5%), followed by drug discontinuation with drug change or symptomatic management (17.8%), change of drug dose (5.4%), and change of dose frequency (16.4%). The study observed an importance of clinical pharmacist in health care sector and impeccable role in patient care. The study concludes that the clinical pharmacist along with other healthcare providers can provide a safer system of patient care and drug utilisation.

KEYWORDS: Drug Related Problems, Reactive intervention, Clinical Pharmacist.**INTRODUCTION**

Pharmaceutical care has been described as the responsible provision of drug therapy to achieve definite outcomes that are intended to improve a patient quality of life. Drug therapy is growing more complex, thus making appropriate drug prescribing increasingly challenging. Despite excellent benefits and safety profile of most medications, drug related problems (DRPs) pose a significant risk to patients, which adversely affect quality of life (QoL), increase hospitalization and overall healthcare costs. However, optimization of drug therapy may, by preventing DRPs, influence health expenses, potentially save lives and enhance patient's quality of life. A clinical intervention is the process of a pharmacist identifying and making a recommendation in an attempt to prevent or resolve, a drug related problems.

The interventions in a medical care is categorized as follows:

1. Active campaigns have sought to alter prescribing in a specific area. The use of guidelines, particularly when backed up by the personal visits reduces inappropriate use of antibiotics, parenteral nutrition therapy and other classes of drugs. The effect of such targeted interventions may be transient and requires regular reviews.
2. Reactive intervention are also called pharmacist initiated intervention and is defined as unsolicited advice to physician if, it was thought that a change in drug, dose, frequency, route or any aspect of drug therapy was considered advisable.
3. Passive intervention involves provision of drug information to health care professionals on various aspects of drug ranging from dose, route of administration to adverse event and drug interactions. Several studies conducted in developed countries shows

the high evidence of drug related errors among hospitalized patients. The studies related to prevalence of drug related problems is lacking in India however some of the studies conducted in Indian hospital show much evidences of drug related problems and also reflects positive impact of pharmacist intervention on reducing drug related errors and overall patients care.^[10]

This study was conducted to determine the incidence of DRPs and to recommend pharmacist interventions to resolve the actual DRPs.

Epidemiology:

It has been estimated by the World Health Organization (WHO), that more than 50% of all the medications are prescribed, dispensed, or sold inappropriately.^[1] Medication error rates found in observational studies are reported to vary between 1.7% and 59%, in which prescription error are reported to be 0.3 - 2.6%.

MATERIALS AND METHODS

The study followed a prospective clinical intervention method which was carried out at PVS Hospital (P) Ltd a 350 bedded multispecialty tertiary care hospital in Calicut, Kerala over a period of six months (December 2015 to May 2016). The study involved collection of data of inpatients of either gender of various age group undergoing treatment in the hospital. Patients undergoing treatment less than one day in the hospital and outpatients were excluded.

The medication details of all the patients admitted in the ward were collected and documented in suitably designed patient profile forms. During review of patient medication details and ward round participation, DRPs were identified and brought in to the notice of concerned physician to take remedial action and the primary reason for initiating the intervention was recorded. In addition appropriate suggestions or managements were provided

to the physicians at the earliest. The DRPs were categorized as dose error, inappropriate drug prescribing, drug- drug interaction, and adverse drug reaction. The acceptance of the physicians for suggestive interventions were recorded as either accepted or not accepted.

The study was approved by the Institutional Ethics Committee, P.V.S. Hospital (P) Ltd, Calicut. Data's obtained was assessed statistically using Chi square test for the necessary data taken using SPSS Software 4 windows version 2.0.

RESULTS AND DISCUSSION

A total of 73 interventions were made and documented during the study.

1. Demographic Characteristics

Among the 73 patients it was found that 42.5% of the drug related problems were seen in the age group above 60 years followed by 31.5% of the drug related problems in age group within 30 years of age, and 26% of DRPs in age group between 31-60 years. 56% of the patients in the 73 reactive intervention had polypharmacy, whereas 44% of the patients received less than 3 drugs. The occurrence for drug related problems (DRPs) in relation to age and polypharmacy were calculated using chi-square test in which the incidence of drug related problems were found to be high (42.5%) among the patients of age group above 60 years followed by age group within 30 years (31.5%) and age group between 31-60 years (26%). A statistical significant difference was found in comparing the DRPs among the different age groups (p value < 0.05). Furthermore, an average of 4.2 drugs were received per admitted patient. Majority of patients have received more than 3 drugs during their admission thus increasing the likelihood of developing the drug related problems. A high statistical significant difference was observed while comparing the DRPs based on the number of drugs (p value < 0.01).

Table-1 Demographic characteristics and findings

Characteristics	Findings	Numbers and Percentage	
1.Demographics	Gender	Male	27 (37%)
		Female	46 (63%)
	Age	<30	23 (31.5%)
		31-60	19 (26.0%)
		>60	31 (42.5%)
	Number of drugs received per patient	<3	32 (44%)
>3		41 (56%)	
2.Types of drug related problems	Adverse drug reaction		51 (69.9%)
	Drug-drug interaction		10 (13.7%)
	Medication error		9 (12.3%)
	Untreated indication		1 (1.4%)
	Addition of an unwanted drug		1 (1.4%)
	Others		1 (1.4%)
3.Severity	Minor		13 (21.3%)
	Moderate		40 (65.5%)
	Major		8 (13.1%)

Types of drug related problem observed

The most common DRP was drug adverse drug reaction which accounted for 69.9% of the total DRPs, which was followed by drug- drug interaction 13.7%, medication error 12.3%, untreated indication 1.4%, addition of drug 1.4% and 1.4% were accounted for other type of drug related problem, which includes errors during patient demographic details entry.

Severity level of drug related problems

The severity levels of drug related problems were analyzed based on three criteria: minor, moderate and major. Minor: Problems requiring small adjustments and optimization to therapy, which are not expected to significantly alter hospital stay, resource utilization or clinical outcome. Moderate: Problems requiring adjustments, which are expected to enhance effectiveness of drug therapy producing minor reductions in patient morbidity. Major: Problems requiring intervention,

expected to prevent or address very serious drug related problems, with a minimum estimated effect on reducing hospital stay by no ≤ 24 hrs. Out of 73 reactive interventions, 21.3% were minor, 65.5% were moderate and 13.1% were major.

1. Reactive intervention

The most frequent recommendation provided by the clinical pharmacist was drug discontinuation (46.5%) followed by drug discontinuation with drug change or symptomatic management (17.8%), change of drug dose (5.4%), and change of dose frequency or schedule (16.4%) and the other type for intervention recommendation (12.3%), which include recommendation made on patient laboratory investigation reports, clinical monitoring parameters, patient advice and prescription entry errors. Various suggestions provided by the intervening clinical pharmacist are summarized in table-2

Table-2: Reactive intervention

Intervention Recommendation	Numbers	Percentage %
Drug discontinuation	34	46.5
Drug discontinuation with drug change/ Symptomatic management	13	17.8
Dose change	4	5.4
Change of dose frequency/ schedule	12	16.4
Drug addition	1	1.3
Others	9	12.3

2. Acceptance of clinical pharmacist's interventions

The acceptance rate of clinical pharmacist recommendation and change in drug therapy was found to be high (80.8%). However, in 19.2% of recommendation the suggestions provided by the clinical pharmacist was not accepted and the therapy was not changed. This perhaps would be because the suggestion provided was thought to be insignificant in contrast to patient's current major clinical condition by the physicians or hesitated to change the prescription immediately without close monitoring of patients.

DISCUSSION

The present study has found more numbers of drug related problems in female patients than in the male patients. These observations were similar to the study conducted by Ramya Movva *et al.*,^[9]

The incidence of drug related problem were found high among the patient were receiving multiple drug therapy or polypharmacy. These findings were similar to the results of the studies conducted by Sathish Kumar BP *et al.*,^[19] and Pamidi Pradeep *et al.*,^[18]

The most common drug related problems was adverse drug reaction which accounted for 69.9% (n= 51) of the total drug DRPs followed by drug- drug interaction 13.7% (n= 10), medication error 12.3% (n=9), untreated indication 1.4% (n=1) and addition of drug 1.4% (n=1) and others included error in patient demography entry 1.4% (n=1). These findings were similar to the result of

the study conducted by Akram Ahamad *et al.*,^[6] Severity level for the drug related problem found that 21.3% of the interventions were address to the minor significant problems. Moderately significant interventions were observed in 65.5% and 21.3% of them were having the impact on major drug related problems. These findings were similar to the study conducted by Sathish Kumar BP *et al.*,^[11]

The present study has found that the most frequent intervention provided by the intervening pharmacist was drug discontinuation followed by drug discontinuation with drug change or symptomatic management. These findings were similar to the result of the studies conducted by Y. Achyuth Kumar *et al.*,^[19]

Acceptance rate for the clinical intervention recommendation by physician in suggestion acceptance and changes in drug therapy were found to be higher. These findings were similar to the result of the studies conducted by Mounica Bollu *et al.*,^[8] Pamidi Pradeep *et al.*,^[18] and Sathish Kumar B. P. *et al.*,^[11]

CONCLUSION

The study showed that the prescriptions reviewed had some drug therapy problems and the pharmacist interventions have promoted positive changes needed in the prescriptions. The study stress on the importance of clinical pharmacist in health care sector and impeccable role in patients care. The interventions significantly improved the appropriateness of prescribing for patients.

As there was a greater acceptance of the pharmaceutical care interventions a joint effort between clinical pharmacists and other health care professionals will provide a safer system of patient care and better utilization of resources, Thus clinical pharmacists not only have greater potential in preventing and/or minimizing the drug related problems, but also have potential to reduce the unnecessary healthcare expenditures arising from the same.

ACKNOWLEDGEMENT

The authors are thankful to Anjana P Soman, Sandheep M and Nasma P for their sincere contribution to clinical pharmacy interventions.

CONFLICTS OF INTEREST

The authors of this study declare that there are no conflicts of interest regarding the publication of this article.

ABBREVIATION

DRPs-Drug related problems, JCAHO-Joint Commission on Accreditation of Healthcare Organizations.

REFERENCES

1. Reis WCT, Scopel CT, Correr CJ, Andrzejewski VMS. Analysis of clinical pharmacist interventions in a tertiary teaching hospital in Brazil. *Einstein (Sao Paulo)*, 2013; 11(2): 190–6.
2. le Grand A, Hogerzeil HV, Haaijer-Ruskamp FM. Intervention research in rational use of drugs: a review. *Health Policy Plan*, 1999; 14(2): 89–102.
3. Brushwood DB. From confrontation to collaboration: Collegial accountability and the expanding role of pharmacists in the management of chronic pain. *J Law Med Ethics*, 2001; 28(4_suppl): 69–93.
4. Carmichael JM, Cichowlas JA. The changing role of pharmacy practice - A clinical perspective. *Ann Health Law*, 2001; 10(1): 179.
5. Muhammed Umair K, Akram A. The Impact of Clinical Pharmacist Interventions on Drug Related Problems in a Teaching Based Hospital. *Int J Pharm Clin Research*, 2014; 6(3): 276-80.
6. Ramya A, Shama S, Sumavarsha M, Pradeep P, Rac NR. Medication Errors: Role of Clinical Pharmacist in a Tertiary Care Hospital. *Eur J Biomed Pharm Sci*, 2015; 2(5): 1556-62.
7. Bollu M, Koushik NK, Nagalohith M, Guduru VS, Venkataramarao. N. Inpatient Drug Related Problems and Pharmacist Intervention at a Tertiary Care Teaching Hospital in South India- A Retrospective Study. *Eur J Biomed Pharm Sci*, 2015; 2(3): 688-705.
8. Movva R, Jampani A, Nathani J, Pinnamaneni SH, Challa SR. A prospective study of incidence of medication related problems in general medicine ward of tertiary care hospital. *J Adv Pharm Technol Res*, 2015; 6(4): 190-4.
9. Annemie S, Hugo R, Peter De P. George VS. Katrina P. Mirko P. Evaluation clinical pharmacist recommendations in the geriatric ward of a Belgian hospital. *Clin Interv Aging*, 2013; 8: 703-9.
10. Prasanna D, Sathish Kumar B P, Rajesh V, Prashant Chandra F. Assessment of Clinical Pharmacist Intervention in Tertiary Care Teaching Hospital of Southern India. *Asian J Pharm Clin Res*, 2013; 6(2): 258-61.
11. Kuo GM, Touchette DR, Marinac S. Drug Errors and Related Interventions Reported by US Clinical Pharmacist: The American College of Clinical Pharmacy Practice-Based Research Network Medication Error Detection. Amelioration and Prevention Study. *Pharmacotherapy*, 2013; 33(3): 253-65.
12. George RM, James E, Vijayalakshmi S. Clinical pharmacist's interventions on drug related problems in a tertiary care hospital. *Int J Pharm Pharm Sci*, 2015; 7(6): 401–4.
13. Sara M, Lydia H. Asa B. Medication reviews in primary care in Sweden: importance of clinical pharmacists' recommendations on drug related problems. *Int J Clin Pharm*, 2015; 38(1): 41-5.
14. Lind KB, Soerensen CA, Salamon SA, Jensen TM, Kirkegaard H, Lisby M. Impact of clinical pharmacist intervention on length of stay in an acute admission unit: a cluster randomised study. *Eur J Hosp Pharm Sci Pract*, 2016; 23(3): 171–6.
15. Cooney D, Moon H, Liu Y, Miller RT, Perzynski A, Watts B. et al. A pharmacist based intervention to improve the care of patients with CKD: a pragmatic, randomized, controlled trial. *BMC Nephrol*, 2015; 16(1): 56-65.
16. Butt M, Ali AM, Bakry MM, Mustafa N. Impact of a pharmacist led diabetes mellitus intervention on HbA1c, medication adherence and quality of life: A randomised controlled study. *Saudi Pharm J*, 2016; 24(1): 40-8.
17. Pradeep P, Kumar MP, Kumar MV, Sandeep K, Chandra P. Health Technology Assessment to Improve Patient Care through Pharmaceutical Care: Clinical Pharmacist's Perspective. *Int J Pharm Biomed Res*, 2015; 2(5): 2-10.
18. Kumar A, Kumar R. Pharmacists interventions and pharmaceutical care in an Indian teaching hospital: A prospective study. *Int J Adv Res Pharm*, 2012; 2(3): 386-96.