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Impact of Counseling and Intervention in Preventing the Drug-Related Problems after Hospitalization and Post-Discharge by Clinical Pharmacist

Gayathri Konduri [a#*], Harshini Kancherla [a#], Keerthana Atla [a#], Akhila Bollam [a#] and Neelam Injeti [a†]

[a] Department of PharmD, CMR College of Pharmacy, Hyderabad, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

Background and Objectives: A Drug-Related Problem is an event or circumstance involving drug therapy that actually or potentially interferes with desired health outcome. Drug-related problems can occur at any stage of therapy which might be during prescribing, dispensing, administration. DRP's account for most of the therapeutic failures. The prevention of DRP is the main responsibility of a pharmacist. According to Pharmaceutical care network Europe, system the DRP'S are classified according to problem, the underlying cause, intervention to be made, acceptance of intervention and outcome. The primary objective of this study was to assess the impact of interventions and counselling on a preventable drug-related problem by a clinical pharmacist.
Methodology: A prospective observational study was conducted in a tertiary care teaching hospital for 6 months i.e., December-2020 to may-2021
Results and Discussion: A total of 96 DRPs were identified and resolved in which 68 out of 96 DRPs indicate therapeutic failure, 27 out of 96 DRPs were due to drug dose too high and 54 DRPs were resolved by intervention i.e., changing dosage regimen. DRPs were classified based on the type of error in which 27 out of 96 DRPs are due to over prescription of drugs. 30 patients were

[#]PharmD 6th Year,
[†]Assistant Professor,
**Corresponding author: E-mail: gayathrikonduri98@gmail.com;*

counseled during discharge about possible DRPs in which 5 out of 30 patients were counseled for cardiovascular disease and after follow up it was found that only 1 patient was readmitted.
Conclusion: Clinical pharmacist plays a key role in detecting, monitoring, evaluating, resolving and preventing drug-related problems. The Clinical pharmacist has a very positive impact on patients through counselling and follow-up. Therefore, better patient care can be provided.

Keywords: Drug-related problem; PCNE; counseling; clinical pharmacist.

ABBREVIATIONS

DRP : Drug-related problem
ADR : Adverse drug reaction
WHO : UMC- World Health Organization-Uppsala Monitoring Centre
ADE : Adverse Drug Event
PCNE : Pharmaceutical Care Network Europe

1. INTRODUCTION

A Drug-Related Problem is an event or circumstance involving drug therapy that actually or potentially interferes with desired health outcome. Drug-related problems can occur at any stage of therapy which might be during prescribing, dispensing, administration. DRPs account for most of the therapeutic failures. The clinical pharmacist plays an important role in the detection, evaluation, prevention of DRPs. A proper drug-related problem has (a) detail on the patient's condition or problem (b) the drug therapy in question and (c) the relationship between the treatment and the patient's condition. According to the PCNE system, drug-related problems are classified according to the problem, the underlying causes, intervention to be made, acceptance of intervention, outcome [1].

Drug-related problems are classified into 7 types:

Unnecessary drug therapy, need additional drug therapy, ineffective drug therapy, dosage too low, dosage too high, adverse drug reaction [ADR] and non-compliance [2]. Medication error is any preventable event that may cause or lead to inappropriate drug use or patient harm while the drug is in the control of health care professionals, patients, or consumers [3]. Medication errors account for the majority of drug- related problems. Medication errors include prescribing errors, transcribing errors, dispensing errors, administration errors. Adverse drug reaction is defined as a response to a drug that is harmful and unintended and which occurs at doses normally used in man for prophylaxis, diagnosis or therapy of the disease or the modification of physiologic function [4]. An expected 12-17% of general medication patients experience adverse drug events after discharge and most of them are preventable. 6-12% of ADE occur at an emergency visit and 5% in readmission [5]. ADR is classified as preventable and non-preventable. Most ADRs are preventable and most commonly occur at prescribing stage [6]. Patient counselling can be defined as giving prescription data orally or in composed structure to the patients or their health care provider or giving appropriate headings of utilization, advice about side effects, storage, diet and way of life alterations. Effective counselling should include all of the boundaries for the patient to receive his or her disease condition medications and lifestyle change requirements [7]. Follow up is a process of making contact with a patient later to check patient progress. Follow up can assist with recognizing misconceptions answering questions making further evaluation and changing treatment. Follow up includes the collection of data from the patient after discharge and helps in better patient care and outcomes as it helps in knowing the patient's day to day health status.

The primary objectives of this study were to evaluate the role of clinical pharmacists in detecting, evaluating, resolving and preventing drug-related problems, to categorize drug-related problems according to the PCNE system, to classify drug-related problems based on the type of errors, to assess the number of drug-related problems pertaining the individual drugs, to categories drug-related problems into preventable and non-preventable, to counsel patients regarding possible drug-related problems, to assess the impact of patient counselling on preventable drug-related problems through follow-up.

2. METHODOLOGY

This is a prospective, observational and interventional study that was conducted in a tertiary care hospital for 6 months. A structural

data collection form was designed for data collection. Review of case sheets by clinical pharmacists during a daily visit to the general medicine ward assisted.

In the detection of DRPs which were resolved on further communication with the physician. Monitoring of the patients for DRPs was done regularly. Patient counselling was given by clinical pharmacists regarding the patient's disease condition, possible DRPs during discharge by doing a case study and checking the medications prescribed during admission and discharge. Patient information was collected for further follow-up. Follow up of the patients was done by clinical pharmacists after 1 week followed by 1 month. If any new symptoms were identified, they were resolved after consulting with the physician. Documentation, interpretation of data and classification of DRPs was done according to the PCNE system.

3. RESULTS AND DISCUSSION

A total of 96 drug-related problems were analyzed during the study period of 6 months. In the present study, 68 out of 96 DRPs indicate problem 1.1 i.e., therapeutic failure, 27 out of 96 DRPs were due to cause 3.2 i.e., drug dose too high, 54 out of 96 DRPs were resolved by intervention 3.2 i.e., dosage change which can be intervention 3.2 i.e., dosage change which can be inferred from Table 1, over-prescription was found to be the major DRP which can be inferred from Table 2, it was found that 83 of 96 DRPs are preventable which was represented in Table 4. The present study also focused on counselling the patients regarding possible DRPs and 30 patients were counselled which was represented in Table 4.

The present study was undertaken to assess the impact of counselling and intervention in drug-related problems after hospitalization and post-discharge by a clinical pharmacist. The study was conducted in a tertiary care teaching hospital and the sample size was analyzed as per our inclusion and exclusion criteria. In our study, 96 drug-related problems were identified and resolved. DRPs were classified according to the PCNE system indicates that problem 1.1: 70.8% i.e. No effect of drug treatment, cause 3.2: 28.1% i.e., drug dose too high, intervention 3.2: 36% i.e., Dosage changed which was correlating to the study done by Berhane YH, Derebew FB with concluding that clinical pharmacist intervention helps to minimize drug-related problems [8]. Also, we have counseled 30 patients regarding their disease condition and possible drug-related problem. 16.5% of patients were counseled for cardiovascular disease which was similar to the study done by Unnati P; Anushreya A.S states that counselling for chronic disease can improve a patient's quality of life. It is observed that counselling in chronic disease conditions would help in improving the patient's health [9]. The present study indicates Pantoprazole (10.4%) drug accounts for most DRPs which is contradictory to the study conducted by Mojtaba SK, Negin M, Dena F which states that drug interactions with warfarin and aspirin account for the majority of DRP's [10]. In our study, over-prescription of drugs, 28.1% is most commonly seen in drug-related problems which were supported by the study done by Irsa J, Fatima A, Anam J stating that pharmacist intervention can reduce most of DRP'S which are existing in our health care system [11].

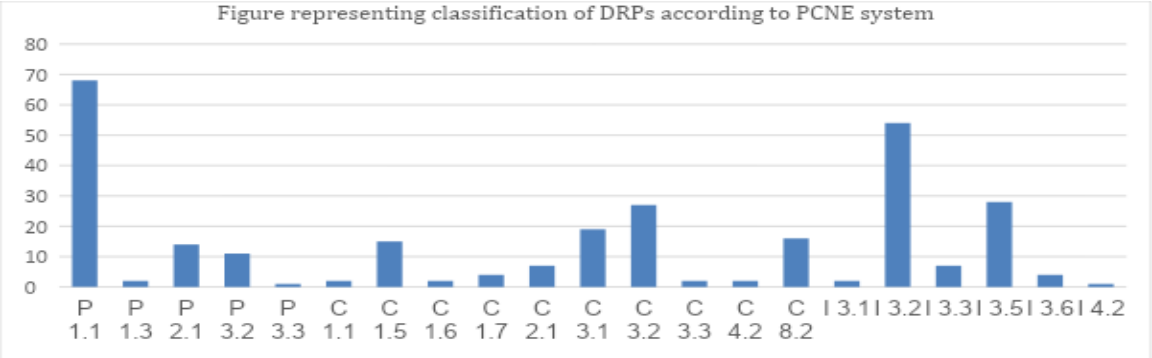

Fig. 1. Classification OF DRPs according to PCNE system

Table 1. Classification of DRPs according to the PCNE system

S. no	Code	Count	Percentage	Type of cause
Problem	P 1.1	68	70.8%	No effect of drug treatment/ therapy failure
	P 1.3	2	2.08%	Untreated symptom or indication
	P 2.1	14	14.5%	Adverse drug event
	P 3.2	11	11.4%	Unnecessary drug treatment
	P 3.3	1	1.04%	Unclear problem/ complaint
	Total	n=96		
Cause	C 1.1	2	2.08%	Inappropriate drug according to guidelines
	C 1.5	15	15.6%	Inappropriate duplication of therapeutic drug
	C 1.6	2	2.08%	No drug treatment despite of existing drug
	C 1.7	4	4.16%	Too many drugs prescribed for an indication
	C 2.1	7	7.29%	Inappropriate drug form
	C 3.1	19	19.7%	Drug dose too low
	C 3.2	27	28.1%	Drug dose too high
	C 3.3	2	2.08%	Dosage regimen not frequent enough
	C 4.2	2	2.08%	Duration of treatment too long
	C 8.2	16	16.61%	Other cause
	Total	n=96		
Intervention 1	I 1.4	96	100%	Intervention discussed with prescriber
Intervention 2	I 3.1	2	2.08%	Drug changed
	I 3.2	54	56.25%	Dosage changed
	I 3.3	7	7.29%	Formulation changed
	I 3.5	28	29.1%	Drug stopped
	I 3.6	4	4.16%	New drug started
	I 4.2	1	1.04%	Side effect reported to authorities
	Total	n=96		
Acceptance	A 1.1	96	100%	Intervention accepted and fully implemented
Status	O 1.1	96	100%	Problem totally solved

Table 2. Classification OF DRPs based on the type of errors

S. no	Name of DRPs	Count	Percentage
1	Overprescribed	27	28.1%
2	Under prescribed	21	21.8%
3	Adverse drug reaction	13	13.5%
4	Duplication error	12	12.5%
5	Ineffective prescribing	08	8.33%
6	Dosage form error	08	8.33%
7	Frequency error	07	7.2%

Table 3. No of DRPs on individual drugs

S no	Drug	No: of DRP	Percentage
1	Pantoprazole	10	10.4%
2	Meropenem	07	7.2%
3	Monocef	06	6.2%
4	Ranitidine	05	5.2%
5	Augmentin	05	5.2%
6	Phenytoin	04	4.1%
7	Zofer	04	4.1%
8	Aspirin	03	3.12%
9	Paracetamol	03	3.12%
10	Folvite	03	3.12%

S no	Drug	No: of DRP	Percentage
11	Furosemide	03	3.12%
12	Prednisolone	03	3.12%
13	Mannitol	03	3.12%
14	Vitamin C	03	3.12%
15	Rifaximin	02	2.08%
16	Tramadol	02	2.08%
17	Acitrom	02	2.08%
18	Ciprofloxacin	02	2.08%
19	Piperacilin+ Tazobactum	02	2.08%
20	Enalapril	02	2.08%
21	Cefixime	02	2.08%
22	Ursodeoxycholic Acid	02	2.08%
23	Naproxen	01	1.04%
24	Warfarin	01	1.04%
25	Atorvastatin	01	1.04%
26	Escitalopram	01	1.04%
27	Remdesivir	01	1.04%
28	Insulin	01	1.04%
29	Metrogyl	01	1.04%
30	Dexamethasone	01	1.04%
31	LMW Heparin	01	1.04%
32	Levofloxacin	01	1.04%
33	Syrup A TO Z	01	1.04%
34	Vertin	01	1.04%
35	Amlodipine	01	1.04%
36	Levipil	01	1.04%
37	Furosemide Spironolactone	01	1.04%
38	Streptomycin	01	1.04%
39	Azithromycin	01	1.04%
40	Iron Folic Acid	01	1.04%
41	Multivitamin	01	1.04%
42	Vancomycin	01	1.04%
43	Dobutamine	01	1.04%
44	Zidovudine	01	1.04%
45	Immunoglobulin	01	1.04%
	Total	n=96	

Table 4. Categorization of DRPs into preventable and non-preventable

Type	No of DRPS	Percentage
Preventable	83	86.45%
Non-preventable	13	13.54%
Total	n=96	

Table 5. No of patients counselled based on their disease

Name of the disease	Count	Percentage
Cardiovascular diseases	5	16.6%
Stroke	4	13.3%
Anaemia	4	13.3%
Hepatic diseases	4	13.3%
Pneumothorax	2	6.6%
Deep vein thrombosis	2	6.6%

Name of the disease	Count	Percentage
Pancreatitis	2	6.6%
Covid	2	6.6%
Young hypertension	2	6.6%
Denovo diabetes mellitus with diabetic keto-acidosis	1	3.3%
Meningoencephalitis	1	3.3%
Organophosphate poisoning	1	3.3%
Total	n=30	

After follow up, only one patient out of 30 patients who were counselled was readmitted to the hospital. This is due to the initiation of anti-tubercular drugs in that patient

4. CONCLUSION

Pharmacists play a key role in detecting, monitoring, evaluating, resolving, and preventing drug- related problems. Drug-related problems are mostly due to medication errors and may lead to adverse drug reactions. In our current study, we have observed that most of the DRP's are due to prescription errors and are preventable when monitored properly by a clinical pharmacist. The clinical pharmacist also plays a very vital role in counselling the patients for better health outcomes. The patient's health condition can be monitored and the quality of life can be improved through Follow-up. Thus, we conclude that clinical pharmacist has a very positive impact on patients through counselling and follow-up. Therefore, better patient care can be provided.

CONSENT

It is not applicable.

ETHICAL APPROVAL

Ethical approval was obtained and preserved by all the authors.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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