



Study of medication errors and compliances for inclusion of new drugs in hospital formulary

Ruchika Garg^{1,*}, Atul Kabra¹, Ashish Chauhan²

¹Department of Pharmacy, Mmanav Bharti University, Solan (H.P.); ²B.R.A. National Institute of Technology, Jalandhar, Punjab, India

Manuscript received 8th June, 2013, revised 15th December, 2013 & accepted 9th January, 2014

Abstract

Background and Objective : Hospital formulary is an information resource that provides medicines and regimen monograph reflecting a range of drugs approved for prescribing within the hospital. An ongoing process where physicians, pharmacists and other healthcare professionals establish policies and select products are medically appropriate and cost effective in interest of given patient population. PTC is responsible for formation and maintenance of drug formulary system. PTC is equivalent body which functions in developing and maintaining the formulary and establishing and implementing policies on use of drug products.

Methodology: A combined effort is made by physicians, managerial and administration staff and nursing staff to improve patient safety by minimizing medication error rate in hospital. **Results:** The results of this study are important not only for the welfare of the patients but also for the economics of healthcare systems and future role of pharmacy personnel in hospitals.

Keywords: Hospital formulary, Pharmacy Therapeutic Committee, Medication Errors

©2014 BioMedAsia All right reserved

1. Introduction

According to National Coordinating Council for errors in medication reporting and prevention (NCC MERP) medication error is "any preventable event that cause or leads to inappropriate medication use or patient or patient harm while the medication is in control of healthcare professionals, patients or consumer¹. Medication errors are classified as near misses errors such as prescription, transcription, documentation and actual errors like administration errors². Hospital formulary is an information resource that provides medicines and regimen monograph reflecting a range of drugs approved for prescribing within the hospital. The drug formulary system is designed and implemented to ensure patient receive high quality patient care and gets cost effective and rational drug therapy³.

Drug Formulary System is an ongoing process where physicians, pharmacists and other healthcare professionals establish policies and select products are medically appropriate and cost effective in interest of given patient population. Pharmacy and Therapeutic Committee (PTC) is responsible for formation and maintenance of drug formulary system⁴. PTC is equivalent body which functions in developing and maintaining the formulary and establishing and implementing policies on use of drug products⁵. The member of PTC includes medical superintendent (chairman), deputy medical superintendent, pharmacist, head of nursing, purchasing, anesthesia and other heads of different departments.

Role of Pharmacy and Therapeutic Committee

1. Appraises, evaluates and select drugs for the formulary.

2. To provide education and inform health care professionals about drug products, usage.

3. Overseas quality improvement programs that employ drug use evaluation.

4. Develops protocol and procedures for use of and access to non formulary drug products⁶.

Functions

1. Filling of new drug request form by doctors
2. Purchase and storage of new drugs.
3. Filling of New Drug Monitoring forms by nurses. Approval of drugs by Pharmacy and Therapeutic Committee (PTC)⁷.

Types of Errors

1. Prescription errors-

These errors arise due to fault in the prescription charts made by physician.

Examples: Illegible handwriting, Confusion with the drug name, Inappropriate use of decimal points (a zero should always precede a decimal point e.g. 0.1 instead of .1 similarly trailing zero must not be there e.g. 1 instead of 1.0, it may lead to confusion, Use of verbal orders, Use of abbreviations e.g. CPZ has intended meaning of prochlorperazine possible misrepresentation may be chlorpromazine⁸.

2. Transcription Error

A transcription sheet is identical copy of physician's order into electronic sheet for assistance to pharmacists and any faults in preparation of transcription sheet are transcription errors. Types of transcription errors:

1. Omission errors: When a drug is prescribed but not

*Corresponding author

Full Address :

Department of Pharmacy,

Mmanav Bharti University, Solan (H.P.), India

E-mail: ruchika.p88@gmail.com

mentioned.

2. Wrong interval: When prescribed dose were not reached to patient at right time.
3. Alternative drug: Medications are replaced by pharmacy without physician's approval.
4. Wrong dose: 0.25mg instead of 0.125 mg in prescription sheet.
5. Wrong route: Ofloxacin I.V is written on sheet instead of Oloxacin tablet.
6. Wrong patient details: It includes name, age, sex, registration no not written or wrongly written on prescription sheet.

3. Administrative Errors

It is any deviation from physician's medication order as written on the patient's chart or any incorrect or wrongful administration of a medication such as mistake in dosage or route of administration, use of outdated drugs, failure to observe the correct time for administration of the drugs.

Reasons for administration errors:

1. Individual staff characteristics: Lack of knowledge in the patients, Lack of knowledge of the patient's diagnosis
2. Policy and procedure related issues: Failure to follow, policies and procedures, Not checking medications against transcription sheet, Lack of standard protocols for the treatment for administration of high risk, Medication.
3. System issues: Excess workload, rotational shifts, nurse to patient ratio, distractions and interruptions.

2. Materials and methods

Research methods means the steps involved in conducting a research. Research methodology in a way is a written game plan for conducting research⁹. The study falls in the category of Retrospective and Descriptive analysis, in this research researcher had to use facts and information already available in different forms(discharged files from MRD)¹⁰. Secondary source of data were used. The data was collected from the discharged files of the patients at the Medical Record

Department (MRD)¹¹. The study protocol was reviewed and approved by Institutional Review Board and Committee on Human Research¹². The survey was approved by the hospital's Clinical Audit and Quality Department .A self made Medication usage audit form was prepared and data was collected for new drugs for a period of five months, November-2011 to April 2012 includes 140 files.

3. Results and Discussion

The total cases of medication error was used in this study was 80. Errors was calculated on the basis of prescription writing, transcription, administration and documentation. It was found highest error in 30% in prescription type (Table I). Table II follows the findings and suggestions.

Table I. Number and percentage of cases in different type of errors (Total cases of medication errors = 80)

Type of errors	No of cases	% of cases
Prescription	42	30
Transcription	10	7.14
Administration	16	11.42
Documentation	12	8.57

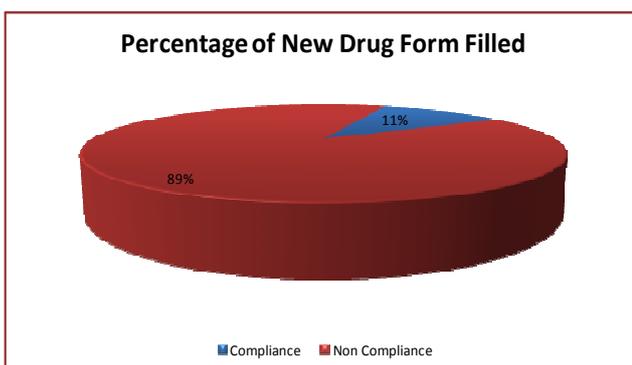


Figure I Percentage compliance with the hospital policy for new drug in case of filling new drug forms

Table II. Finding and suggestions

Sl. No.	Finding	Suggestion
1	It was found that new drug form filled by sisters were only 11% of total cases ideally every sister should fill new drug form at the time of administration of new drugs	A strict control over sisters is required. Pharmacist should send form along with medicines to the sisters
2	Based upon ABC analysis A &B class of drugs contain 1 drug and C class contains 16 drugs Based upon HML analysis H class contain 1 drug, M contain 2 drugs, L contains 33 drugs	Eptifibatide, Doripenem, Sildenafil, Clonazepam, Doxopylline, Clopidogrel, Ranolazine, Calcium Acetate should be included in Hospital formulary.
3	Medications errors were found to be more than what it should be, ideally in practical there is no room for any error in hospital settings but these errors should be avoided as maximum as possible . Prescription errors- 23.35% Transcription errors – 5.1% Administration errors- 8.7% Documentation errors -6.25%	Prescription order must have a brief notation of the purpose. There should be a double check system of medication which can prevent administration errors. There should be more education given to patients ^{13,14,15}

Conclusion

The formulary system of Aggarwal Hospital Patiala is well structured which effectively monitors the various aspects before inclusion of new drugs in formulary.

A combined effort is made by physicians, managerial and administration staff and nursing staff to improve patient safety by minimizing medication error rate in hospital.

Inj. Eptifibatide and Inj. Doripenem should be controlled by top management.

The results of this study are important not only for the welfare of the patients but also for the economics of healthcare systems and future role of pharmacy personnel in hospitals.

Conflict of Interest

Authors declare no conflict of interest.

References

1. National Coordinating Council for Medication Error Reporting and prevention. What is a medication error? http://www.nccmerp.org/council/council_996-09-04.html (accessed on 29/05/2010).
2. Caspi A, Rozenfeld V, Kleymen J Prevention of Medication Errors in Hospital Setting: *The Role of Pharmacy Students* **30** (2005) 183.
3. Chen YF, Neil KE, Avery AJ, Dewey ME, Johnson C Prescribing errors and other problems reported by community pharmacists. *Therapeutics and Clinical Risk Management* **1** (2005) 333-342.
4. CNRBC practice. Nursing documentation.
5. Coasta LA, Valli C, Alvarenga AP Medication and Dispensing errors at a public pediatric hospital, *Rev Latino-am Enfermagem* **16** (2008) 812-7
6. Cranej, Crane FG, Preventing Medication Errors in Hospitals Through a Systems Approach and Technological Innovation: A Prescription for 2010, Held Ref Publication **84** (2006).
7. Demehin AI, Babalola OO, Erhun WO, Pharmacists and Nurses Perception of Medication Errors in a Nigerian University Teaching Hospital *International Journal of Health Research* **1, 2** (2008) 51-61
8. Fahimi F, Nazari MA, Abrishami R et al, Transcription errors observed in a Teaching Hospitals. *Archives of Iranian Medicines* **12** (2009) 173-175
9. Farbstein K Case study in Medication safety improvement *JCOM* **9** (2002) 501
10. Gupta CR, Gupta KK, Jain BR and Garg RK, ABC and VED Analysis in Medical Stores Inventory Control. *MJAFI* **63** (2007) 325-327
11. James KL, Barlow D, McCartney R, Hiom S, Roberts D, Whittlesea C Incidence, Type and Causes of dispensing errors: a review of the literature *International Journal of Pharmacy Practice* **17** (2009) 9-30
12. Khowaja K, Nizar R, Merchant RJ, Dias J, Gavino IB & Malik A A systematic approach of tracking and reporting medications errors at a University hospitals, Karachi, Pakistan. *Therapeutic and Clinical Risk Management* **4** (2008) 673-679
13. Miaso AI, Oliveira RC, Silva AEB et al, Prescription errors in Brazilian hospitals: a multi- centre exploratory survey, *Cad Saude Publica Rio de Janeiro* **25** (2009) 313-320
14. Prayitno A The agreement between hospital formulary and medicine prescribed, 2008, Hyatt Regency Surabaya Hotel-Indonesia.
15. Royal Pharmaceutical Society. Decriminalisation of Dispensing Errors.