Original Article

Drug utilization study in patients attending emergency department at a tertiary care hospital in Punjab: A prospective observational study

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ABSTRACT

Drug utilization study is to make possible the intelligent use of medicines in populations. Trend of drug usage is studied to determine the incidence and prevalence of usage of drugs, to analyze whether the recommended guidelines for prescription are being followed or not. This is a prospective observational study of ($N = 260$) patients who were admitted in the Emergency Department of Guru Gobind Singh Medical College and Hospital, Faridkot and Garg Hospital, Moga, Punjab. A total of 260 prescriptions were analyzed and sum of drugs prescribed was 1449. The mean of drugs prescribed per prescription (World Health Organization indicator of standard prescription) was 5.70 ± 0.212. Of sum of drugs encountered, i.e., 1449, 71.35% (1034) of the drugs were administered through injectable form. The most common disease or condition which was responsible for emergency admission was metabolic disorder ($N = 47$) followed by cardiovascular disease ($N = 44$). It was also estimated that polypharmacy was commonly prevalent in most of the prescription analyzed. Of 260 patients, 63.5% ($N = 165$) of patients were on polypharmacy. Our study concluded that polypharmacy was more often practiced; hence, there is a need to restrict polypharmacy as it is a matter of concern to decrease incidence of drug interactions and adverse drug reactions too. The antibiotics were the most commonly prescribed drugs; hence, there should be rational use of antibiotics. Even overuse of proton-pump inhibitors and overdosing antibiotics are areas of concern.

Keywords: Drugs, drug utilization evaluation, emergency department, polypharmacy

INTRODUCTION

Drug utilization study, as described by the World Health Organization (WHO), is a structured process which is used to assess the quality of drug therapy by engaging in the evaluation of data on drug prescribing, dispensing and patient use in a given health-care environment, against predetermined, agreed on criteria and standards, with special emphasis on the resulting medical, communal, and financial consequences.[1]

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Proper drug evaluation study has a great emphasis to global minimization in morbidity and mortality with its associated medical, communal, and financial benefits.[2]

It is more prevalent in developing countries where health allowance is less and 30–40% of the total health allowance is spent on medicines.[3]

The WHO has formulated a set of core drug use indicators, which measure the performance of prescribers, patients experience at health facilities and whether the health personnel can function effectively. The assessment of drug use indicators according to the WHO guidelines on how to investigate drug use in health facilities is prescribing indicators, patient care indicators, facility indicators, and complementary indicators.[4]

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METHODOLOGY

This prospective observational study was carried out in the emergency department at a tertiary care hospital in Punjab region for 6 months (November 2017–May 2018). The sample size was calculated through StatCalc Epi info. The sample size taken was 320 patients, but only 260 were enrolled in the study who meets the inclusion and exclusion criteria of the study.

Inclusion criteria

All patients irrespective of age, diagnosis admitted in the emergency department were included in the study.

Exclusion criteria

Patients who were critical in clinician's opinion were excluded from the study. The patients enrolled for the evaluation was grouped based on their age group and category of disease.

The data were interpreted using SPSS ver. 16. Approval was given by the Institutional Ethics Committee of ISF College of Pharmacy, Moga. A descriptive study was evaluated to explain basic features of data in the study and to summarize about the sample and the measures in a simple way.

Objective

The objective of this study was to evaluate the WHO indicators, i.e., average number of drugs prescribed per prescriptions, number of injections prescribed, number of antibiotics prescribed, and number of drugs encountered from essential drug list (EDL).

RESULTS

In our study, information obtained from total 260 prescriptions of patients admitted in the emergency department was collated and interpreted. During the study among 260 patients attending the emergency room, it was revealed that 61.9% (161) patients were found male, whereas 38.1% (99) patients were female. The mean age group patients admitted were 52.57 ± 16.006 years. It was seen that among the different age groups of the patients admitted, majority 105 (40.4%) of patients presenting to emergency medicine department were 21–30 years of age followed by 102 (39.2%) patients with 31–40 years of age group. The most common disease or condition which was responsible for emergency admission was metabolic disorder (N = 47) followed by cardiovascular disease (N = 44) [Table 1].

Among total 260 prescriptions analyzed, the total number of drug of prescribed was 1449. Of total number of drugs prescribed, i.e., 1449, 71.35% (1034) of the drugs were administered through injectable form. Injectable was followed by oral administration contributing 28.64% (415) of total drugs encountered. Of total 1449 drugs prescribed, 18.70% (271) of the drugs were antibiotics while 45.34% (657) drugs were from EDL [Table 1].

Table 1: Disease type, WHO indicators, therapy type, and commonly prescribed drugs

Parameters	Frequency
Type of disease	
Metabolic disorder	47
Cardiovascular disorder	44
CNS disorder	38
GIT disorder	31
WHO indicators used in the study	
Number of drugs encountered during the study	1449
Number of antibiotics prescribed	271
Number of injections prescribed	1,034
Number of drugs from EDL	657
Types of therapy given during the study	
Monotherapy	17
Dual therapy	28
Triple therapy	50
Polytherapy	165
Most commonly prescribed drugs	
Antibiotics	164
Diuretics	114
Proton-pump inhibitors	104
Analgesics	102

CNS: Central nervous system disorder, GIT: Gastrointestinal tract disorder, EDL: Essential drug list, WHO: World Health Organization

A total of 63.5% (N = 165) of patients were on polypharmacy. The distribution of the drugs among patients included in this study was as follows: 20.4% (53) patients received 8 drugs, 7.3% (19) patients received 9 drugs, 4.2% (11) patients received 10 drugs, 1.2% (3) patients received 11 drugs, 0.8% (2) patients received 12 drugs, 0.4% (1) patients received 13 drugs, and 5.0% (13) patients were there who received 14 drugs. There was no such patient who does not receive any drug [Table 1].

In our study, antibiotics (N = 164), diuretics (N = 114), proton-pump inhibitors (PPIs) (N = 104), and analgesics (N = 102) were the more often encountered drugs among 260 total prescription evaluated [Table 1].

DISCUSSION

As we know that study on drug use in emergency medicine is important not only for the emergency physicians but also for the general practitioners, who are often the first responders to emergencies in the middle- and low-income countries.[5] In the present study, the drug use pattern of drugs used in the emergency medicine department for initial treatment was studied in the emergency medicine department of the hospital. A prescription-based survey (drug utilization study) is considered among the most effective methods to analyze the prescribing pattern of drugs and prescribing behavior of physicians. Monitoring the trends in drug utilization in emergency medicine can provide insight into major health-care problems.

Our study evaluated that the mean number of drugs encountered per prescription (WHO indicator of standard prescription) was 5.70 ± 0.212. In another Indian study, the mean number of drugs encountered

Table 2: Comparison between different studies

Name	Our study	Cheekavolu *et al.*[6]	Barot *et al.*[7]	Sharonjeet Kaur *et al.*[8]
Number of drugs encountered per prescription	5.70±0.212	4.2±1.2	9.99±2.55	4.9

per prescription was 4.9 ± 1.2, which supports our study results.[6] In another Indian study of prescribing in the emergency room, the mean number of drugs encountered was 9.99 ± 2.55/prescription which was contrast to our study results [Table 2].[7]

This study revealed that the mean of drugs encountered from EDL was 2.53 ± 0.94, whereas the WHO recommends an average number of drugs per prescription to be 2.0. It is necessary to keep mean number of drugs as low as possible to minimize the adverse effects, potential drug-drug interaction.[9]

Antibiotics, diuretics, PPIs, and analgesics were the most routinely prescribed drugs among 260 total prescription evaluated. Antibiotics were prescribed more to prevent any further infection. While PPIs were prescribed, because they are safe and efficacious for elevating intragastric pH in critically ill-patients for prevention of bleeding from stress-related mucosal damage. However, a study mentioned H2-receptor antagonists as appropriate initial agents, although PPIs have become first-line therapy in an increasing percentage of critical care patients, despite limited data regarding their use in this population maximum patients were inappropriately prescribed pantoprazole without any approved indication, which was also reported by the earlier study.[10]

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CONCLUSION

Our study concluded that polypharmacy was most commonly prevalent; therefore, there is requirement to prohibit polypharmacy because it is a matter of concern to decrease incidence of drug interactions and adverse drug reactions too. The antibiotics were the more often prescribed drugs; hence, there should be rational use of antibiotics. Even overuse of proton-pump inhibitors and overdosing antibiotics are areas of concern. Even there was difference in prescribing pattern of drugs during emergency from the standard recommended by the WHO. It also concludes that there is a significant role of clinical pharmacist in managing rational use of antibiotics and other drug therapies and also in improving quality of life. Further studies are required to confirm outcomes in large population.

Limitations of our study

Relatively less number of patients was studied, and they were not followed after their discharge from the ward. The study can be expanded in future including other departments to evaluate drug utilization in vulnerable groups such as children and pregnant women.

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