

Management of Drug Related Hospital Admissions

Sundus Basharat, Shaheen Asmat, Dr.Marriam Zaka

Department of Pharmacy, Lahore College For Women University

Abstract- Drug related problems are frequent and may result in reduced quality of life and even morbidity and mortality. Many studies have shown that Clinical Pharmacist can effectively identify and prevent clinically significant drug-related problems and that Physician acknowledge and act on the clinical pharmacist's suggestions for intervention to the drug related problems. A pro-active rather than the reactive approach on the part of that Pharmacist seems prudent for obtaining most benefit. This includes participation of Pharmacist's in the multidisciplinary team discussion at the stage of ordering and prescribing where all types of drug related problem, including also potential problems, should be discussed. In addition, counselling by Pharmacist about medication on discharge and follow up after discharge resulted in better outcome. Furthermore, clinical Pharmacists can positively influence other outcomes such as improvement of levels of markers for the drug use (e.g. optimization of lipid levels, anti-coagulation levels and blood pressure). Some studies have reported positive effects on hard clinical outcomes, such as reduced length of stay, fewer re-admissions and fewer disease events (e.g. Heart failure events and thromboembolism). However, more studies should be undertaken with a larger patient populations including patients from multiple sites. More knowledge about patient specific factors that predict improved care is also needed. In conclusion, there is increasing evidence that participation and interventions of clinical Pharmacist in Healthcare positively influence clinical practice.

I. INTRODUCTION

A drug related problem (DRP) is defined as an event or circumstance that involves a patient's drug treatment that actually, or potentially, interferes with the achievement of an optimal outcome. Problems associated with the drug use have a wide set of factors that can be considered as DRP viz. adverse drug reactions, drug interactions, untreated indication, inappropriate drug selection, sub-therapeutic dosage, supra-therapeutic dosage, non-compliance and drug use without indication. DRP admissions have been significantly increased over the past few decades. According to various studies on drug related hospital admissions, it was estimated that around 5–10% of hospital admissions were due to drug related problems, in which 50% of them are avoidable. DRP admissions need high attention as DRP related admissions on an average accounted for 8.36%. Increased use of medicines, existence of multiple inters current disease states and polypharmacy are some of the risk factors for DRPs.

Geriatric population showed a high incidence of DRP admissions. Pharmacological and pathological changes leading to alteration in pharmacodynamics and pharmacokinetic parameters

of drug absorption, distribution, metabolism and excretion in elderly patients are believed to be the reasons why geriatric population is the most affected group among DRPs. Antiplatelet, anticoagulants, antineoplastic, immunosuppressive, diuretics, antidiabetics and antibiotics showed a high profile of drug related problems. Majority of DRP admitted patients presented with chief complaints of weakness due to dehydration, electrolyte imbalance; bleeding, GI disturbances, anemia, hypoglycemia, secondary infections etc.(1)

It has been reported that drug related problems associated with medications' use have contributed to a major portion of the health expenses in most of the countries. In a study conducted by Smith et al., the frequency of drug 'reaction' in hospitalized patients had been studied, and they had shown that more the number of drugs, higher is the incidence of DRPs. These authors attributed the increase in morbidity due to polypharmacy, mainly when the patients are on 10 or more drugs. Twenty-four percentage of DRPs were found out to be due to drug interactions.(2)

Drug related illness were classified as adverse drug reactions overdose, abuse, non-compliance, drug interactions or toxicity. Patient data included demographic characteristics, medication history, serum drug conc, length of hospital stay and hospital admission charges. The drug classes most commonly involved were drug of abuse (23.2%), anti-convulsing (17.1%), anti-biotics (12.6%), respiratory drugs (8.9%), and pain medications (8.9%). The most common category of drug related illness was overdose or abuse (35%) followed by non-compliance (28%), ADR (28%), toxicity (8%) and drug interaction (1%). Drug related illnesses accounted for (2.9%) of hospital admissions and visits for patients in the emergency department. The most commonly identified drug related illnesses were overdose or abuse, non-compliance, and ADR's (3)

Most drugs causes liver injury infrequently, these reactions are called as idiosyncratic reactions occurring in 1 in every 1000 patients to 1 in every 10000 patients with a pattern that is consistent for each drug and for each class. The drug reaction varies from 5 to 90 days from the injection of the drug and is fatal if the drug is continued after the reaction has been accrued. In contrast the drug such as isoniazid the mild injury may disappear after the drug is continued. However in case of the acetaminophen thr hepatocyte injury depends upon the dose of the drug so dose is a major determinant factor in case of acetaminophen hepatocyte toxicity.(4)

Drug-related problems (DRPs), including treatment failures and adverse drug events (ADEs), are a pervasive patient safety issue. They are particularly common after hospitalization, when multiple changes to patients' medication regimens may be accompanied by inadequate patient education, follow-up, and continuity of care. These factors commonly result in inappropriate medication prescribing, discrepancies between

prescribed and actual regimens, poor adherence, and inadequate surveillance for adverse effects. These problems may cause preventable ADEs and increased health care utilization. An estimated 12% to 17% of general medicine patients experience ADEs after hospital discharge, more than half of them judged preventable or ameliorable (i.e., duration or severity could have been decreased); 6% to 12% of ADEs result in emergency department (ED) visits and 5% in hospital readmissions. (5)

Hospital pharmacists have the expertise to address DRPs during and after hospitalization. They can counsel patients at discharge, detect and resolve medication discrepancies, and screen for nonadherence and ADEs after discharge. Data suggest that counseling patients before discharge reduces medication discrepancies and improves adherence. Pharmacist follow-up after discharge has mixed effects on ED visits, hospital readmissions, and costs, and effects of pharmacist interventions on ADEs after discharge are unknown. The objectives of this study were to identify DRPs during and after medical hospitalization and to evaluate the effects of counseling and follow-up by pharmacists on the rate of preventable ADEs, health care utilization, medication nonadherence, and medication discrepancies 30 days after discharge from an acute care hospital. We hypothesized that pharmacist interventions would reduce the rate of preventable ADEs. (6)

Aims and objectives:

- The objective of the study was to derive results from various studies conducted on drug related hospital admissions.
- Overall view about the incidence, frequency, cost of treatment, major causative drugs.
- Problem for drug related hospital admissions, and preventable drug related admissions and summarize the factors responsible for the occurrence of DRP

II. LITERATURE REVIEW

Over the past 40 years, advances in drug therapies have both improved patient care and led to an apparent increase in the incidence of drug related problems being reported. Before 1960s, there were fewer drugs available and drug related problems were not systematically assessed. Literature from this time focused on adverse drug reactions. Problems relating to complications of drug therapy resulting in significant illness and hospital admission were first highlighted in 1969. This early work was followed by reports from other groups including the Boston Collaborative Drug Surveillance program. These initial studies put the frequency of such hospital admissions as 1.8–6.2% . (8)

The proportion of elderly emergency admissions that were drug related hospital admissions (DRHA) varied between 15% and 22% in Australian studies. This is considerably higher than in studies that also included younger patients. In Australia an incidence of between 2.4% and 3.6% was found and in the United States an incidence of between 3.1% and 6.2% was found. European studies performed in medical departments admissions due to certain ADRs according to WHO (World Health Organization) criteria encounter 3.2% in France and 6.2%

in Germany of all admitted patients, while in a prospective computerized event monitoring study in internal medicine departments in Swiss general and teaching hospitals admissions were due to ADRs encounter 3.3%. (9)

In a UK study of ADR related admissions in all hospitals using the computer-assisted International Classification of Diseases (ICD) coding system ADR related admissions represented 0.5% of total hospital admissions. A study in India carried out in a tertiary referral center in South India showed that admissions due to ADRs accounted for 0.7% of total admissions and deaths due to ADRs accounted for 1.8% of total ADRs. (10)

When medications are prescribed for patients for the treatment of disease, the full intent of all parties involved should be the achievement of an optimal therapeutic outcome. Optimal therapeutic outcome has been defined as an absence of drug-related problems (DRP). A DRP is defined as an event or circumstance that involves a patient's drug treatment that actually, or potentially, interferes with the achievement of an optimal outcome. (11)

Unresolved or unrecognized DRPs may manifest as drug-related morbidity, which has been described as the phenomenon of therapeutic malfunction or miscarriage the failure of a therapeutic agent to produce the intended outcome. If left untreated, drug-related morbidity may ultimately lead to drug-related mortality. There is a considerable body of literature that suggests that a large proportion of drug-related morbidity is preventable. The cost of drug-related morbidity and mortality in the ambulatory setting is considerable and should be considered in health policy decisions with regard to pharmaceutical benefits. On the basis of data obtained in the early 1990s, estimated that, on average, \$76.6 billion is spent annually in the ambulatory setting in the United States to resolve DRPs, with drug-related hospitalizations being the largest component of this cost. Policies and services should be developed to reduce and prevent drug-related morbidity and mortality. Purpose of the study was to investigate type, nature and incidence of drug related admissions in a hospital in Pakistan. (12)

Medications that act on the central nervous system (35.5%) were most often related to a trauma. In our study over dose toxicity is the common reason for emergency admissions due to CNS drugs. In a similar study that was reported CNS drugs contributed for 5.1% of cases. In another study, CNS drugs most commonly involved were drugs of abuse (23.2%) and anticonvulsants (17.1%) CVS drugs were the second contributing category drugs for drug related hospitalizations. The major drugs of this category were presented in . Among these drugs thiazide diuretics were identified as contributors of hyponatremia were as antiarrhythmic contributed to toxicities. Almost similar result was found in another study where CVS drugs contributed to 18.3% of the emergency visits. Darnell et al. found that 5.7% of emergency admissions to hospital over a period of 1 month were drug-related, with 83 drugs being implicated. Over 30% of these medications included antihypertensive, diuretics, anticoagulants and other cardiovascular drugs (13)

12.3% of drug related hospitalizations cases were due to NSAIDs. A UK study estimated that 1.9% of NSAID users were admitted to hospital each year with upper gastrointestinal emergencies. There are clear differences in risk with different

NSAIDs, and some clearly are associated with higher risks of upper gastrointestinal bleeding than others. In this study, we have found that Aspirin is the main reason for hospital admission in 69% of cases among NSAID users. While the Italian study demonstrated a particularly high risk with ketorolac (. A new study reveals that NSAIDs such as Ibuprofen increases the risk of a hospital admission for the condition by 30 % (14)

Antibiotics were also found to have a significant contribution to the category of drug related admissions (11.3%). Drugs included were sulfasalazine, amino glycosides, antileptotics, ant tubercular and tetracyclines. Aminoglycoside induced toxicities were mostly ototoxicity's mainly caused by streptomycin's. Antiepileptics-dapsone induced methaemoglobinaemia and ATT-rifampicin induced hepatitis, drug reactions were also reported. Almost similar results were revealed by a retrospective review of drug related visits to hospital emergency departments over a period of one year in US. This antibiotic contributes for 15.4% of the cases anticoagulants were responsible for 9.9% of cases of drug related hospital admissions. These were due to acute gum bleedings, upper gastrointestinal bleedings and allergic reactions caused by these drugs. Various studies had shown antithrombotic had highest incidence of hospitalization. In a Netherland study, medication associated with potentially preventable hospital admissions were those that affect blood coagulation, such as antiplatelet drugs (8.7%), oral anticoagulants (6.3%), NSAIDs (5.1%), and a combination of these medicines (10.5%) Other classes of drugs such as cytotoxic drugs, hypolipidemic, antihistamines, and oral hypoglycemic agents were remarkably causing drug related hospitalizations. Steroid induced cases were Cushing syndrome, myopathies and hypoglycemia caused by drugs like prednisone and betamethasone (15).

In the Pakistan study of drug related hospital admissions were classified as adverse drug reactions, overdose of abuse, noncompliance, drug interaction, or toxicity .Patient data included demographic characteristics, medication history, serum drug concentration, length of hospital stay, and hospital admission charges. Of 10,184 patients who visited the emergency department, 293 (2.9%) had drug related illness, 71 (24%) of these patient were admitted. The drug class most commonly involved were drugs of abuse (23.2%), anti-convulsions (17.1%), antibiotics (12.6%), respiratory drugs (8.9%), and pain medication (8.9%). The most common category of drug related illness was overdose or abuse (35%) followed by noncompliance (28%), ADR (28%), toxicity (8%), and drug interaction (1%). Drug related illness accounted for 2.9% of hospital admissions. The most commonly identified drug related illness were overdose or abuse, noncompliance, and ADR the drug classes most commonly implicated were drug of abuse, anticonvulsants and antibiotics. Drug-related hospital admissions (DRVs) are a significant contributor to morbidity, mortality and health care costs worldwide. While most documentation of the problem has focused on DRVs attributed to adverse drug reactions (ADRs), few researchers have explored other drug-related problem (DRP) etiologies categorized within the pharmaceutical care nosology, including inappropriate medication selection or dosing; untreated symptoms or disease; drug interactions; and patient non-adherence. Features of patient populations at-risk for DRVs have been consistently described

(the elderly, those with impaired cognition, dependent living situations, renal insufficiency, multiple comorbidities or polypharmacy) as have the most common offending therapies (antiplatelet, anticoagulants, non-steroidal anti-inflammatory drugs (NSAIDs), diuretics, angiotensin converting enzyme (ACE) inhibitors, opioids, and diabetes treatments. (16)

Several broad recommendations for the reduction of preventable DRVs have been proposed such as improving communication between acute and ambulatory health care providers when patients transition between care settings; conducting regular review of prescription medications to avoid therapeutic duplication and to discontinue unnecessary drugs; advising patients to frequent one community pharmacy and to discuss self-selection of over-the-counter (OTC) and herbal therapy with a pharmacist or physician. Enhanced patient monitoring is also frequently suggested. Baseline and follow-up assessment of renal function in populations at-risk is most often cited, but improving the monitoring of other specific laboratory values according to the prescribed therapy (e.g. INR for anticoagulated patients, potassium for diuretic-treated patients) is also advocated. Unfortunately, low adherence to enhanced laboratory monitoring has been demonstrated even when straightforward protocols are devised. Early detection of DRPs does not always require blood testing; certain unfavorable medication responses manifesting clinically may be recognized by straightforward patient assessment. Simple vital sign evaluation is efficient and non-invasive and therefore has potential for greater drug monitoring adherence. Altered body physiology leading to harmful conditions and attributed to medication may be generally grouped within the broader context of assignment of ADR-associated DRVs, but their differentiation is important as distinct preventative measures may be considered. (17)

III. STUDY DESIGN

TYPE OF STUDY: It was a retrospective as well as prospective study. Data collection form was designed which contained many questions regarding Role of Pharmacist in the management of Drug related hospital admissions.

Sample size: 25 no of cases.

Place Of Study: various public and private sector hospitals in Lahore.

Study Duration: 1 month.

Inclusion Criteria: Man, Women.

Methodology: The topic Role of Pharmacist in the management of Drug related hospital admissions was assigned. The project was completed in selected Sample size was 100, Data collection form was prepared, which comprised of questions regarding Role of Pharmacist in the management of Drug related hospital admissions. Data collection forms were filled by face to face interaction with consultation of health care providers. Results were calculated and presented in the form of tables and graphs.

IV. RESULTS AND DISCUSSION

Drug related problem is a categorization of drug problems in the field of Pharmaceutical care that happen between Physicians, Pharmacist and Patients. These problems are identified prevented and resolved primarily by Pharmacist but it can be taken care of by any Healthcare provider that provides Pharmaceutical care. Majority of DRP studies conducted in developed countries. Most of these were retrospective, multicenter studies conducted in general population. A study was held at "MANAGEMENT OF DRUG RELATED HOSPITAL ADMISSIONS" at different hospitals of Lahore to get information about the Drug related hospital admissions was obtained by filling a data collection form by Healthcare providers. According to the study we cover the survey with 40% Doctors 40% Pharmacist and 20% Paramedic staff. 80% professionals advice patients appropriately while 20% not. 80% of DRP's belongs to NSAIDS 8% to antidepressants 8% to sedative/hypnotics and 4% to another. 32% DRP's are dose related 40% drug related 20% dose frequency related and only 2% related to route of adm.. 80% agree that Polypharmacy is cause of DRP's while 20% disagree. 80% agree that contraindicated medicines in particular patients cause DRP's while 20% disagree. 72% agree that patient was receiving incorrect drug while 28% disagree. 100% agree that DRP's related to the way the patient uses the medicine. 100% agree that DRP's are result of drug-drug, drug-food and drug-lab test interactions. 84% agree that pt is taking drug for no medically valid indication while 16% not. 80% agree that DRP's due to not selecting most effective drug for the indication while 20% disagree. 40% of pt.'s forget to take drug or 40% of pt.'s afraid of drug, 12% unwilling to change drug while only 8% DRP's are not related to pt. psychology. Drug related hospital admission are rare.. Pharmacist involvement in identification and resolution of DRP's is average. System for the documentation or prevention of DRP's is present. The common problem Physician face is the risk of patients building a tolerance to the drug taken (such as morphine to control pain) which leads to the patient's body requiring higher doses for the drug to be effective, which can lead to drug overdoses. Additionally, many side effects of drugs inhibit the body from absorbing necessary nutrient which can lead to the additional problem for the patient. None of this is the least surprising and has been well known within the literature on adult education for many years.

V. CONCLUSION

The primary objective of the studies was to estimate DRP frequency, incidence, risk factors, and the trends of DRP's admissions. NSAID's, CVS drugs, and CNS drugs were identify to precipitate most of the DRP's. Polypharmacy, non-compliance, prescription error and dose related factors were underlying reasons for developing DRP's. Upto 50% DRP's related to hospital admissions were preventable. Hospital could bring down therapy cost incurred to treat DRP admission to a greater extent. This gives an idea on how much extent a Clinical Pharmacist could play a vital role in preventing the DRP's. This study highlights the need for a greater awareness for drug related admissions. The solution to this problem is enhanced

collaborative efforts among patient's physicians, pharmacist and caregivers within the community and the hospital. Recognition of patient, prescriber, drug and disease factors as well as appropriate therapeutic modification, should be pursued. This can be enhanced by a research focus on current studies that identify preventable events accurately to explore how they happen and how to prevent them.

VI. RECOMMENDATIONS

- Communicate with healthcare providers about medication.
- Designate a medication manager,
- Keep a medication list.
- Consult with the Doctor or Pharmacist before taking over the counter medication or Herbal supplements
- Use common sense when using medication.
- Obtain refills in a timely manner.

REFERENCES

- [1] Graziano Onder, Claudio Pedine, Journal of American Geriatric society, 2002 Dec, vol 50(12):1962-1968. Retrieved on 9-3-2016
- [2] Dr. Kent M. Nelson, Dr. Robert L. Talbert. the Journal of human Pharmacotherapy and Drug therapy, 1996 Aug, vol 16(4): 701-707 retrieved on 9-3-2016
- [3] BS Prince, CM Goetz. American Journal of Health system, 1992 July, vol 49(7):1696-1700. Retrieved on 9-3-2016
- [4] William M. Lee, New England Journal of medicine, 2003 July, vol 349:474-485. Retrieved on 9-3-2016
- [5] Jaffery L. Schnipper, Jennifer L. Kirwin. Role of Pharmacist in preventing ADR after Hospitalization, 2006 March, vol 166(5). Retrieved on 9-3-2016
- [6] [6] Munir Pirmohamed, Sally James, Shaun Meakin. ADR as cause of Admission to hospital, 2004 July, vol 329(7456):15-19. Retrieved on 9-3-2016
- [7] Einarson. drug related hospital admissions. 1993, 27(7):832-840
- [8] Ernst, Grizzle. Drug related morbidity and mortality: updating the cost of illness mood. 2007, 41(2):156-157
- [9] Easton. Frequency and characteristics of hospital admissions with drug related problems in pediatrics. 2004, 57(5):611-615
- [10] Helpers, Strand LM, opportunities and responsibilities in pharmaceutical care, 1990, 47:533-543
- [11] Ernst, Grizzle. Drug related morbidity and mortality: updating the cost of illness mood. 2007, 41(2):156-157
- [12] Chan, Adverse drug events as cause of hospital admissions in elderly, 2001, 31:199-205
- [13] Blower, emergency admissions for upper gastrointestinal disease and their relations to NSAID use. 1997, 11:283-291
- [14] Samoy LJ, Zed PJ. drug related hospitalization in tertiary care internal medicine service. 2006, 26:1578-1586
- [15] Singh H, Kumar BN, incidence and nature of drug related hospital admission, 2011, 2:17-20
- [16] Zed PJ, Abu-laban RB, incidence severity and preventability of medication related visit to the emergency department. 2008. 178:1563-1569

AUTHORS

First Author: Sundus Basharat, 5th Prof Pharm-D, Lahore College for Women University, sundusbasharatlcwu@yahoo.com.

Second Author: Shaheen Asmat, 5th Prof Pharm-D, Lahore
College for Women University, Shaheenlcwu@yahoo.com.

Third Author: Dr. Marriam Zaka, MPhil in clinical pharmacy,
Lahore College for Women University,