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Research Article

"ANALYSIS OF ADVERSE DRUG REACTION RELATED HOSPITAL ADMISSIONS AND COMMON CHALLENGES ENCOUNTERED IN ADR REPORTING IN A TERTIARY CARE TEACHING HOSPITAL"

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ABSTRACT

Objective: The specific objective of this study is to see the clinical spectrum of Adverse Drug Reaction related hospital admissions in a tertiary care hospital and to identify common challenges encountered in ADR collection process. Methods: We did a cross sectional analytical study for a period of one year (Aug.2011-Sept.2012). After Institutional Ethical Committee approval, hospitalization due to adverse drug reactions from various departments in our tertiary care hospital was analyzed. Descriptive analysis of the ADR data collected is done by Microsoft Excel software and expressed as percentage comparison. Results: The number of hospital admissions due to ADR was 33. Of these 45.5%were male and 54.5%were female. Maximum number of patients (66.7%) was reported with dermatological manifestations. Nearly 30.3% of patients have taken these medicines as over the counter. Among the causative drugs, 57.5% of ADR were due to Antibiotics, in which majority (42%) is due to Quinolones, followed by NSAIDs (30.3%), Antiepileptic (6.1%), Antipsychotics (3.1%) and hormonal drug (3.1%). About two third of the patients (69.7%) admitted with ADR were hospitalized for more than 5 days. According to the WHO Causality assessment scale, 12.1% of the ADRs were certain, 75.8% probable and 12.1% were possible. Severity assessment by Modified Hartwig and Siegel scale revealed 66.7% ADRs to be moderate, 27.3% were severe and life threatening, 6.1% were mild. Conclusion: A wide clinical spectrum of ADRs from maculopapular rash to serious SJS and TEN was observed in our study. For effective patient care, there is an urgent need to develop better preventive strategies and reporting of ADR by every health care provider to be made mandatory.

Keywords: Adverse drug reactions, Pharmacovigilance, Patient Safety

INTRODUCTION

Adverse Drug Reaction (ADR) is a global problem and a major concern in patient safety and clinical practice. Today patients are treated with multiple drugs where ADRs are inevitable. The potential consequences of ADR are it affects patient's quality of life, it imposes significant economic burden to the patients and make them to lose confidence in their treating patients. If we believe that the first principle in treating patients is '*primum non nocere*' i.e., 'above all do no harm' we should be aware of the possibility of ADRs.

Adverse drug reactions have been creating headlines over the last fifty years since the Thalidomide tragedy. It is almost axiomatic that all drugs carry the potential to produce undesirable effects, in addition to the desired ones. This is often paraphrased by saying that all drugs are poisons, the dose alone making the difference. In various studies, adverse drug reactions have been implicated as a leading cause of considerable morbidity and mortality [1] ADRs can arise from many sources, even if a drug is correctly selected and dosed. To the patient an unnecessary hospital admission caused by adverse drug reactions (ADRs) is an unnecessary loss of health as well as an unnecessary loss of quality of life [2, 3] The widely accepted definition of an ADR is 'a response to a drug that is noxious and unintended and occurs at doses normally used in man for prophylaxis, diagnosis or therapy of disease, or for modification or physiological function' [4, 5]. Drug related hospital admission - Admission caused by any undesirable clinical manifestation that is consequent to and caused by the administration of a particular drug. The clinical manifestation may be a clinical sign, symptom, or abnormal laboratory test or it may be a cluster of abnormal signs, symptoms, or tests [6].

Incidence of ADRs: ADRs found to be the fourth to sixth leading cause of death in United States and serious ADRs accounted for 6.7% of hospitalized admissions [3].A study from 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 [7]. Pharmacovigilance plays an important role in judicial use of medicines [8].It is estimated that only 5% of ADRs are reported [9, 19]. For effective patient care, there is an urgent need to develop better preventive strategies and reporting of ADR by every health care provider to be made mandatory.

Although numerous studies have done to evaluate the pattern and preventability of adverse drug reactions, only limited studies are available regarding drug related injury in South India. Therefore we aimed to see the clinical spectrum of ADR related hospital admissions in a tertiary care hospital, to establish a causal link between the drug and reaction, and to identify common challenges encountered in ADR collection process and methods to promote ADR reporting.

MATERIALS & METHODS

This was a cross sectional analytical study for a period of one year (Aug.2011-Sept.2012). After Institutional Ethical Committee approval, hospitalization due to adverse drug reactions from various departments in our tertiary care hospital was analyzed. ADR cases were diagnosed by physicians and confirmed by a clinical pharmacologist. A registry of reported ADRs was maintained & analyzed for causality using WHO Causality Assessment Scale& severity using Modified Hartwig and Siegel scale. The reports were sent to National centre Ghaziabad in the WHO-UMC Programme for International Drug Monitoring through VigiFlow. It is a web-based Individual Case Safety Report (ICSR) management system, specially designed for use by Regional Pharmacovigilance centers.

RESULTS

Descriptive analysis of the ADR data collected is done by Microsoft Excel software and expressed as percentage comparison. The

number of hospital admissions due to Adverse Drug Reaction was 33 (0.12%). Of these 15(45.5%) were male and 18(54.5%) were female. Elderly age group comprised of 7 patients (21.2%). Nearly 10 (30.3%) patients have taken these medicines as over the counter. According to the WHO Causality assessment scale, 12.1% of the ADRs were certain, 75.8% probable and 12.1% were possible as shown in figure 1.

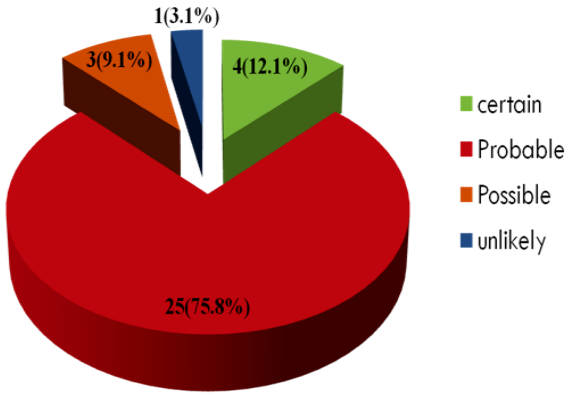

Figure 1: Causality Assessment (WHO Scale)

14 patients (42.4%) were found to have Type-A, Augmented ADR and 19 patients (57.57%) due to Type B, Bizarre ADR. Figure 2 shows Severity assessment by Modified Hartwig and Siegel scale. About 66.7% ADRs to be moderate, 27.3% were severe and life threatening, 6.1% were mild.

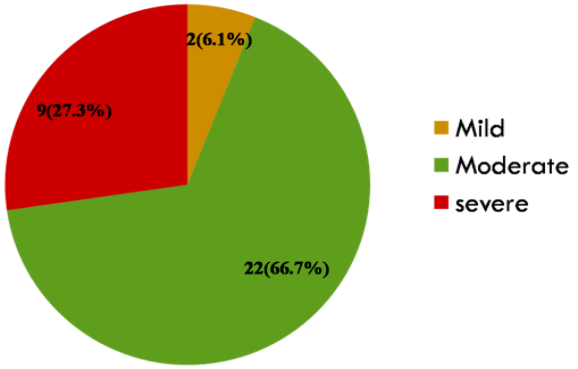

Figure 2: Severity assessment (Modified Hartwig &Siegel scale)

Table 1: Analysis of severe reactions & causative drugs

Type of Reaction	Causative Drug	Number
Angioedema	Ofloxacin	2
	Phenytoin	1
Steven Johnson's syndrome	Amikacin	1
	Cefixime+ofloxacin	1
	Aceclofenac	1
SJS + TEN overlap	Paracetamol	1
Toxic Epidermal Necrolysis	Aceclofenac	1
Severe Exfoliative dermatitis	Paracetamol	1
Total		*9*

Table 1 shows the analysis of causative drugs causing severe reactions. Among the causative drugs involved in severe reactions, severe exfoliative dermatitis and toxic epidermal necrolysis (TEN) Steven Johnson's syndrome (SJS) was caused by Paracetamol. TEN and SJS was reported due to Aceclofenac. Among the antibiotics Ofloxacin caused angioedema (2 cases) and Cefixime Ofloxacin combination caused SJS (1 case) and one case of SJS was reported with use of Amikacin.

Table 2: Class of drugs involved

Drug Class	No. of Events	Percentage
Antimicrobials	*17*	*57.5%*
Quinolones	8	24.2%
Penicillins	3	9.1%
Cephalosporins	2	6.1%
Rifampin	2	6.1%
Antifungal	2	6.1%
NSAIDs	*10*	*30.3%*
Antiepileptics	2	6.1%
Antipsychotic	1	3.1%
Hormonal drug	1	3.1%
Total	*33*	*100*

Table 2 shows different class of drugs that caused ADR. Among the causative drugs, 57.5% of ADR were due to Antibiotics, in which majority (24.2%) is due to Quinolones, followed by NSAIDs (30.3%), Antiepileptic (6.1%), Antipsychotics (3.1%) and hormonal drug (3.1%).

About two third of the patients (63.6%) admitted with ADR were hospitalized for more than 5 days and 15.2% of patients were admitted for more than 20 days as shown in figure 3.

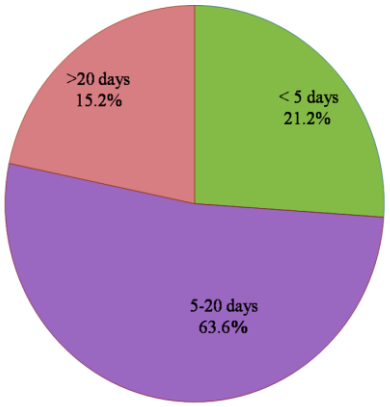

Figure 3: Analysis of hospitalized days

Table3 shows clinical spectrum of adverse drug reactions. Maximum number of patients 25 (75.75%) was reported with cutaneous manifestations.

Table 3: Clinical Spectrum of ADRs & drugs involved

Type of Reaction	Drugs	Number
Maculopapular eruption	Rifampin, Aceclofenac, Paracetamol, Ampicillin, Levofloxacin, Amoxicillin	10
Urticarial lesion	Paracetamol, Ampicillin, Ofloxacin, Cefixime	4
Fixed drug eruption	Carbamazapine, Ofloxacin, Griseofulvin	3
Exfoliative dermatitis	Paracetamol, Ofloxacin, Permethrin	3
Steven Johnson's syndrome	Cefixime, Ofloxacin, Amikacin, Paracetamol	4
Toxic Epidermal Necrolysis	Aceclofenac	1
Angioedema	Ofloxacin, Phenytoin	3
Drug induced Gastritis	Amoxycillin, Diclofenac, Paracetamol	4
Neurological	Haloperidol	1
Total		*33*

There were 10 cases of Maculopapular eruption (30.3%), Urticaria 4 cases (12.1%), Stevens Johnson syndrome 4cases(12.1%), Drug induced Gastritis 4 cases (12.1%), Fixed Drug Eruption 3 cases(9.1%), Exfoliative Dermatitis 3 cases (9.1%), 1 patient with Angioedema(9.1%), 1 patient with Toxic Epidermal Necrolysis (3%) and 1 patient with Neurological side effects (3%).

DISCUSSION

In our study 33 admissions were due to ADR. Our findings are similar to other reports generated in other study [10].However ADR related hospitalization is lower in comparison with studies done in Western population. Determining the actual cause of ADR is most complex aspect of therapeutics. There is always difficulty to bridge the gap between 'clinical hunch' and 'scientific rigor' [11]. Under-reporting by doctors is well known, and in India also, the spontaneous reporting system has produced lower rates of reporting [12].The demographic details of our study showed female gender predominance over males, which was similar to that of other studies reported in the literature [7]

The most common systems associated with ADRs in our study were skin. This finding is consistent with many studies which have reported a higher percentage of dermatological manifestations than other system manifestation [13]. In our study, antibiotics and analgesics were the most commonly involved drug classes in ADRs. This finding is consistent with the previous studies [10, 14, 15].The most common drugs involved in ADR were Ofloxacin, Amoxicillin, Ciprofloxacin, Aceclofenac, Diclofenac and Paracetamol.

Our Study showed that about 30.3% of the patients reported with ADR took the drugs as over the counter medications, which shows effective interventions should be made awareness of ADR to be inculcated to the patients, to avoid drug related hospital admissions. About 69.7% of the patients in our study were hospitalized for more than one week, which shows the economic burden and sufferings of the patients due to drug related adverse events [16]. It is likely that many of them particularly the avoidable and potentially avoidable ones may be minimized by patient and physician education and better prescribing practices and thus lead to considerable cost savings.

However the study has certain limitations. Data has been collected from a tertiary care hospital, where on average, more serious patients are seen. We considered hospitalization due to ADR and not included adverse events occurred during hospital stay of the patients.

Pharmacovigilance is an arm of patient care. It aims at making the best use of medicines for the treatment or prevention of disease [17, 18, 19]. In our study Under Reporting was a major constraint in identifying the adverse drug event related admissions, followed by Lack of Awareness among the health care workers about the ADRs. Creating Awareness about importance of ADR reporting for health care providers are essential to minimize drug related morbidity.

CONCLUSION

ADRs have proved a significant problem in healthcare. A wide clinical spectrum of ADRs from maculopapular rash to serious SJS and TEN was observed in our study and the majority of the causative drugs are antibiotics. Nearly one third of the patients were admitted with severe reactions in our study. Awareness programmes about the importance of ADR reporting for health care providers are essential to minimize drug related morbidity. The active initiation of Pharmacovigilance programme in all possible health care sectors will add further value in the protection of patient safety.

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