



Assessment of Adverse Drug Reactions reported to the regional Adverse Drug Reaction Monitoring Centre at a tertiary care teaching hospital in Bhopal.

KEYWORDS

ADRs, Pharmacovigilance, Causality.

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ABSTRACT This study was designed to assess the Adverse drug reactions (ADRs) reported to tertiary care teaching hospital. A total of 174 ADRs, reported during 1 year period among which Dermatology department reported maximum 131 (75%). Most common ADRs reported were acneiform eruptions [n=61, 35.05%]. Among the total ADRs, topical steroids [n=60, (34.48%)] were responsible for most of the reactions followed by antimicrobial drugs and NSAIDs [n=20, (20.69%)] each. The causality of maximum ADRs were probable 148 (85.05%) with the suspected reaction. This study strongly suggests that there is a greater need for streamlining of hospital based ADR reporting and monitoring system to create awareness so that majority of ADRs can be prevented.

Introduction

Recent studies suggest Adverse drug reactions (ADRs) to be the fourth major cause of death in the USA. [1, 2] Significant morbidity and mortality is associated with ADRs and also have a major impact on public health by imposing a considerable economic burden on the society and the already-stretched healthcare systems.[3] According to WHO'S definition "ADR is a response to a drug that is noxious and unintended and occurs at doses normally used in human for the prophylaxis, diagnosis, and treatment of disease, or for modification of physiological function".[4,5] But It is estimated that only 6-10% of all ADRs are reported so underreporting of ADRs is a major problem.[4] Spontaneous reporting of ADRs is very crucial for detecting new safety issues related to drugs. Hence Pharmacovigilance (PV) has subtle importance in today's healthcare. Pharmacovigilance is "The Pharmacological science relating to the detection, assessment, understanding and prevention of adverse effects, particularly long term and short term side effects of medicines." [6] Pharmacovigilance not only helps early detection of ADRs, but also facilitates identification of both risk factors and mechanisms underlying the ADRs. Although India is participating in the program, its contribution to Uppsala monitoring database which is responsible for maintaining international database of ADR is very little.[7]

ADRs are seen frequently in hospitals due to a combination of factors such as, complexity of diseases, drug interactions, polypharmacy and possible negligence. Organized studies on incidence of ADRs have been very few and are confined to very few centers.[8,9] Present study was undertaken to characterize the ADRs reported in our hospital with regard to the demographics of patients affected, drugs and reaction characteristics, causality, severity, and predisposing factors of the ADRs.

Materials and Methods

A Longitudinal observational study was undertaken in Gandhi Medical College and associated Hamidia Hospital, Bhopal between August 2014 and July 2015 (One year duration). Department of Pharmacology, Gandhi Medical College, Bhopal is Regional ADR monitoring center (AMC) under Pharmacovigilance Programme of India (PvPI). It was part of ongoing Pharmacovigilance activity at the Institute which had the necessary administrative and Institutional Ethics Committee clearance.

Detailed drug and clinical history, and relevant information about suspected reaction, its onset, duration, temporal association with drug intake if any, were recorded in a suspected ADR reporting form. The causality relationship among ADR and drug was assessed using WHO-UMC ADR causality assessment criteria. [10]

Results

After continuous efforts of promoting awareness among healthcare professionals at our hospital we got only 174 Suspected ADRs in this duration. It was observed that number of senior and junior doctors and nursing staff were aware of Pharmacovigilance and PvPI now.

Out of total 174 cases, the mean age of patients who experienced ADRs was 29 years, although ADRs were observed in both gender but slight male preponderance was seen (n=93, 53.44%) over female (n=81, 46.55%).

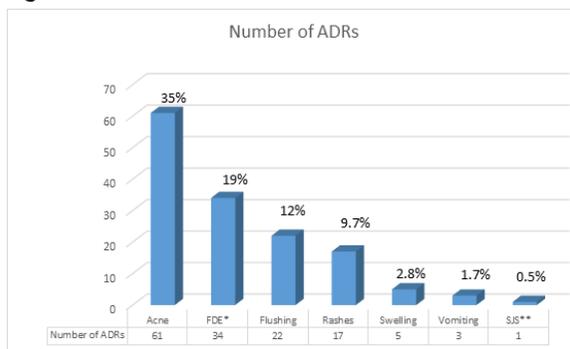
Out of total 174 ADRs reported, 137 cases were reported in OPD while 37 were reported in IPD patients. Maximum number of ADRs were found in age group of 11-20 yrs. (n=61, 35.06%) followed by 21-30 yrs. age group (n=55, 31.61%).

Table: Distribution of parameters

TABLE		
Parameters	Number	Percentage
AGE WISE DISTRIBUTION		
1-10 yrs.	4	2.30%
11-20 yrs.	61	35.06%
21-30 yrs.	55	31.61%
31-40 yrs.	20	11.49%
41-50 yrs.	20	11.49%
51-60 yrs.	9	5.17%
Above 60 yrs.	5	2.87%
SEX WISE DISTRIBUTION		
Male	93	53.44%
Female	81	56.55%
CAUSALITY WISE DISTRIBUTION		
Certain	7	4.02%
Possible	19	10.91%
Probable	148	85.05%

Most common ADRs observed were cutaneous which include Acne (n=61, 35%), Fixed Drug Reaction [FDE] (n=34, 19%), Flushing (n=22, 13%) and Rashes (n=17, 10%). Other ADRs include Vomiting (n=3, 2%) Swelling (n=5, 3%).

Figure: Number of ADRs



*FDE= Fixed Drug Eruption. **SJS=Steven Johnson Syndrome

Maximum number of cases were reported from Dermatology department (n=131, 75%) followed by Department of Medicine (n=18, 10%). Oncology Department reported (n=12, 7%) while TB & chest Department reported (n=9, 5%).

Maximum number of ADRs were caused by Topical steroids (n=60) 34.48% followed by Antimicrobials and NSAIDs (n=20) 20.69% each. Anticancer drugs were the cause of (n=11) 6.32%, Phenytoin (n=4) 2%, Antipsychotics and ATTs were (n=5) 2.87% each. Topical Betamethasone produced maximum ADRs which were mostly in form of acneiform eruptions. ADRs of Swine flu drug Oseltamivir were also reported (n=3, 1.87%) which were nausea, vomiting, and chest pain. One case of Carbamazepine induced Steven Johnson Syndrome (SJS) was also reported.

The causality assessment showed 148 (85.05%) of the ADRs to have a 'Probable', 19 (10.95%) showed 'Possible' and 7 (4%) showed 'Certain' relationship with the suspected reaction. Majority of the ADRs were non-serious 161 (92%) and only 13 (8%) cases were serious and required prolonged hospitalization.

Discussion

ADRs are an important public health issue. Despite the efforts being made to reduce the incidence of medication-related adverse events, the morbidity and mortality due to drug-induced reactions continue to be unacceptably high. ADRs are one of the major causes of iatrogenic diseases. They are often not recognized and, even if they are recognized, they are underreported. Many health professionals are unaware of their importance and possible consequences.

Demographic details of our study showed male preponderance over females which is consistent with the earlier report by Gupta et al. [11] Sex ratio in admitted patients might be an intervening factor but does not seem to be a major determinant.

Pirmohamed et al have shown a greater percentage of geriatric population suffering from adverse reactions which is not consistent with the present results in which more number of ADRs were found in 11-30 years of age group. [12]

In our study, maximum number of cases were reported from outpatient department (n=137, 78%) which differs from the most of the studies which show maximum number of cases from inpatient department. Effective comparisons of this incidence with data in other studies could not be done since most of the studies report incidence of ADRs either in hospitalized patients or outpatients and were based on a prospective surveillance methodology. [13-16] Results in our study may be due to the active coordination of technical associate & post graduate students of pharmacology department in the wards and their constant encouragement might have helped clinicians to notify ADRs, that resulted in better reporting than comparable studies in India. It also shows need of active participation from paramedical staff of the hospital.

In our study, maximum number of cases were reported from Dermatology department (n=131, 75%) followed by Department of Medicine (n=18, 10%). Oncology Department reported (n=12, 7%) while TB & chest Department reported (n=9, 5%) which was similar with other studies done in the past. [17]

Studies have shown age, gender, co morbidity, number of drugs, and length of stay in the hospital as significant risk factors for development of ADRs [17, 18-23].

Drug class most commonly involved in the reactions was Topical steroidal agents (n=60, 35%); a finding not consistent with other studies in which antibacterials or analgesics were most commonly associated. [23,24] Reason for this may be due to self-medication & over the counter use of topical steroids which we observed in our study. Antibacterials & Non-Steroidal Anti-inflammatory agents (NSAIDs) were second most common cause of ADRs which accounts for 21% (n=36) of total ADRs caused. They were followed by anticancer drugs accounting for 7% (n=11) of total cases.

Causality assessment was done by using WHO-UMC scale. The assessment done by using WHO scale reveals that 85% of ADRs were probably drug related, 23% of ADRs were possibly drug related, whereas 7% were classified as certainly related to drug similar to the results in another study by Suh et al. [24] but different from the results observed by Murphy and Frigo [25] in which more of possible reactions were noticed.

Our study has its own limitations. Underreporting, a well-known limitation of spontaneous reporting program needs to be taken into consideration while interpreting the data. Since the study data was obtained from only one hospital, the results may not be generalizable to the entire population. But, our study data would give an insight into the pattern of ADRs which do occur in tertiary care hospitals with a comparable pattern of patient demographics and drug usage. In some of the reports, the outcome of the ADR after de-challenge and re-challenge could not be assessed due to lack of patient follow up. The outcome data if available could have probably altered the causality assessment results in these reports. Difference in drug usage pattern in our set up from the settings in which the other studies were conducted could have contributed to the difference in pattern.

Conclusion

This study strongly suggests that there is greater need for streamlining of hospital based ADR reporting and monitoring system to create awareness; And to promote the reporting of ADRs among healthcare professionals. Measures

to improve detection and reporting of ADR by all health care professionals and patients should be undertaken, to ensure patient's safety. Over the counter use of medicines should be discouraged so that majority of ADRs can be prevented. Moreover method should be evaluated to detect ADRs due to over the counter medicines.

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