ADVERSE DRUG REACTION REPORTING AND MONITORING SYSTEM AT KIMS HOSPITAL, BANGALORE

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Summary

Drug related complications lead to hospitalization, patient suffering and economic burden. ADR monitoring and reporting helps in detection and prevention of reoccurrence of ADRs. The objective of this study was to conduct ADR reporting and monitoring at KIMS Hospital. This was a prospective, observational, voluntary reporting study, conducted from 10/06 to 05/07. Awareness was created among all the healthcare professionals to report ADRs, and the details of ADR cases were collected and analyzed. A total of 13810 patients were admitted and 31 ADRs were reported during the study period. At least one ADR was reported in 0.21% of the hospitalized patients, majority of ADRs were reported by medicine department. Among the reported ADRs, majority occurred in adults, 18 (58.06%). Majority of ADRs affected the skin (21). Causality assessment revealed (19) ADRs in 'Possible,' (6) in 'Probable,' and (6) in 'Definite' categories. Severity assessment showed (26) ADRs in 'Moderate,' (3) in 'Mild,' and (2) in 'Severe' categories. This study reveals that awareness and motivation have a positive influence on ADR reporting. Less number of ADRs indicate under-reporting, reasons for which is to be found and worked out to strengthen the process of reporting.

Key words: ADRs, Awareness, Causality, Severity.

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Introduction

Medicinal substances are widely used for their effect on biological processes in the body, but often their safety is not completely established during clinical trials. Drug safety assessment hence is an integral part of day to day clinical service; WHO defines an Adverse Drug Reaction (ADR) as "a response to a drug which is noxious and unintended and which occurs at doses normally used in man for the prophylaxis, diagnosis or therapy of disease or for the modification of physiological function".[1]The factors like polypharmacy, age, gender, race, genetics, multiple and intercurrent diseases can cause morbidity and mortality. Any one of the above factors can lead to higher risk of ADRs.[2] ADRs are responsible for a significant number of hospital admissions, (0.3% to 11%).[3] About 2.9% to 5.6% of all hospital admissions are due to ADRs and as many as 35% of the hospitalized patients experience an ADR during their hospital stay.[4] The average cost of treating an adverse event in US is $ 2500[5] and cost per patient in India is Rs.690/- (US $ 13.8).[6]An ADR monitoring and reporting program can thus help to improve the economic impact due to ADRs.[7] There are many regulatory authorities involved in the safety monitoring of medicines. The WHO program was established in 1968 as a pilot project with the participation of ten countries initially and later strengthened by many.[8]In India the concept of clinical pharmacy is still in evolutionary stage with very few hospitals in the country having adopted such ADR monitoring and reporting programs till now. By monitoring the positive and negative effects of medicines and reporting the same, we can provide better medical treatment and patient care. This is an integral part of professional duty of every health care professional.[2] Evaluation of the causes of ADRs and ADR report information should be used for educating the health care team to identify rational use of drugs and preventing reoccurrence of ADRs. Pharmacists along with other health care professionals should actively involve in ADR monitoring and reporting.[9]
The department of pharmacy practice of Visveswarapura institute of pharmaceutical sciences (established in 2003), is working with the objectives of

1. Motivating the health care team at KIMS, Bangalore to actively participate in ADR monitoring and reporting system.

2. Assess the causality and severity of ADRs and report to higher centres.

Methodology

Study Site: This study was conducted in Kempegowda Institute of Medical Sciences (KIMS) and Research Center, Bangalore. It is a 1000-bedded tertiary care teaching, superspeciality hospital, providing specialized health care services to all strata of people in and around Bangalore.

Study Design: This study was a prospective, observational, voluntary reporting study.

Study duration: Seven and a half months (October 2006 to May 2007).

Ethical approval: The complete project work was done according to the permission granted by the human ethical committee of VIPS, Bangalore.

Inclusion criteria: The inclusion criteria of this study were

1. All the suspected ADRs that may be due to the medications, both prescribed and over the counter, taken by patients either as inpatients or outpatients, that are ultimately noted and reported by different departments of the KIMS Hospital.

Exclusion criteria: The exclusion criteria of this study were the adverse drug reactions that result due to

1. The use of alternative system of medicines like Ayurveda, Homeopathy, Unani, etc.
2. Over prescribing, Over Dosage and Excess consumption.

Sources of data: The sources of data included

1. ADRs that are reported from various departments of KIMS hospital.
2. From ADR notification forms.
3. Case sheets of the patients.
4. Treatment charts.
5. Investigation reports

Study procedure: The study procedure included the following steps

Preparation of ADR reporting forms (yellow cards): Yellow cards were prepared which included all the relevant data such as name of the patient, age, sex, height, weight, date of the event occurring, brief description of the reaction, name of the suspected drug causing the reaction, reaction stopping date, drug causing the reaction and name of the clinician reporting the reaction.

Preparation of ADR documentation forms: ADR documentation form was prepared which included all the relevant data such as name of the patient, age, sex, height, weight, date of the event occurring, brief description of the reaction, name of the suspected drug causing the reaction, reaction stopping date and name of the clinician reporting the reaction, causality assessment, severity assessment etc.

Creating awareness: Awareness activities were conducted in all the departments of the hospital such as medicine, skin, surgery, ENT, pediatrics, preventive medicine etc., by means of distributing awareness letters and by distributing the yellow cards to the health care professionals personally. Awareness was also conducted to nurses by distributing the yellow cards to them in the wards and informing them to report any ADR if they suspect. Awareness posters were prepared and were displayed in prominent areas of the hospital (out-patient department, wards, Pharmacy, lifts etc.) During the ward round participation the yellow cards were carried and shown to the doctors and the health care professionals were intimated that they could report the ADRs to the pharmacy practice department.

Collection of data: Upon receiving the report investigator visited the respective ward or the department and collected the necessary details. When an ADR was suspected, the data from the patient profile form such as patient details, patient medication details including non prescription drugs, alternative treatments and recently ceased medications, comprehensive adverse reaction details including description of the reaction, time of onset and duration of the reaction and treatment given with relevant investigation reports were collected.

Documentation: The data collected were documented in the adverse drug reaction documentation form.

Causality and severity assessment: The causality was assessed by using Naranjo causality assessment scale and the severity was assessed by using the Hartwig severity assessment scale.

Reporting to higher centers: All the reported ADRs were further reported to higher centers in the CDSCO form to the nearby peripheral center at Department of Pharmacy Practice Al-Ameen college of Pharmacy Bangalore and from there the reports were forwarded to the higher centers.

Results

A total of 13810 patients were admitted to the hospital and 31 ADRs were reported during the study period of seven and a half months from October 2006 to May 2007. At least one ADR was reported in 0.21% (29 inpatients of 13810) of the hospitalized patients.

1. ADRs reported per month during the study period: An average of four cases of ADRs per month was reported to the department of Pharmacy Practice of KIMS hospital by the Health care professionals of the KIMS hospital. We found that maximum numbers of ADRs 8(25.81%) were reported in the month of February. The ADRs that were reported to the department during the study period is presented in the Table 1.

2. ADRs reported by different departments: Majority of the ADRs were reported by the medicine department 12(38.71%), followed by the Blood bank 11(35.48%), Skin 3(9.68%), Tuberculosis 2(6.45%), Dental 2(6.45%) and Pediatric 1(3.23%) respectively. The ADRs that were reported by the various departments during the study period is presented in the Table 2.

3. Patients Demography: It was found that among the reported ADRs majority of them had occurred in the Adult age group 19-60yrs 18 (58.06%) followed by Pediatric group 10 (32.26%) and Geriatric group 3 (9.68) members respectively. In the reported ADRs 20(65%) were females and 11(35%) were male.

4. Pharmacological classes of drugs implicated to cause ADRs: In terms of the pharmacological classes of drugs implicated to cause ADRS Blood and blood products were found to be maximum ie 11(35.48%) cases followed by Antibiotics, Antiepileptics, ATT, Analgesics and Antipyretics 3(9.68%) cases each, followed by NSAID's 2(6.45%) cases and other classes like Steroids, Antileprotics, Antidepressants, Vaccines, Anti ulcer and Vitamins 1(3.23%) cases each respectively. The pharmacological classes of drugs implicated to cause ADRS are presented in the Table 3.

5. Organ system affected by ADRs: In terms of organ system affected by ADRS it was found that majority of the drugs were found to affect skin 21(67.74%) followed by Body 7(22.58%), GIT 2(6.45%) and Mouth 1(3.23%) respectively.

6. Causality assessment: Causality assessment was done using Naranjo scale and it was found that most of the ADRs belonged to the category Possible 19(61.29%), followed by Probable 6(19.35%) and Definite 6(19.35%).

7. Severity assessment: Severity assessment was done by using Hartwig Scale and it was found that 26(83.87%) ADRs were Moderate in severity, 3(9.68%) were Mild in severity and 2(6.45%) were severe.

8. Management of ADRs: Most of the ADRs 23(74.19%) were managed by symptomatic treatment, while 8(25.81%) cases required specific treatment.

Table 1: ADRs reported per month during study period

Month	No of ADRs reported	Percentage
2006 October	2	6.45
2006 November	5	16.13
2006 December	3	9.68
2007 January	6	19.35
2007 February	8	25.81
2007 March	4	12.90
2007 April	1	3.23
2007 May	2	6.45
Total	31	100

Table 2: ADRs reported by different departments

Department	No of cases	Percentage
Skin	3	9.68
Medicine	12	38.71
Blood bank	11	35.48
Pediatric	1	3.23
Dental	2	6.45
Tuberculosis	2	6.45
Total	31	100

Table 3: Pharmacological classes of drugs implicated to cause ADRs

Drug class	No of reactions	Percentage
Vitamins	A	3.23
ATT	3	9.68
Analgesics & Antipyretics	3	9.68
Blood & blood products	11	35.48
NSAID's	2	6.45
Antibiotics	3	9.68
Antiepileptics	3	9.68
Antiulcer	1	3.23
Vaccines	1	3.23
Antidepressants	1	3.23
Antileprotics	1	3.23
Steroids	1	3.23
Total	31	100

Discussion

World Health Organization (WHO) under the Pharmacovigilance program recruited about 78 countries as its members.[5,10] Most of these member countries have a well-established ADR reporting system and primarily doctors are given responsibility to report ADRs.[5] In India, the National Pharmacovigilance program (NPP) encourages the doctors and hospital pharmacists to report ADRs. The National Pharmacovigilance advisory committee has foreseen that the pharmacists can play very important and active role in ADR reporting and monitoring.

The incidence of ADRs observed in this study was found to be low compared with the incidence mentioned by Murphy *et al* [4] based on the data from other studies. One major reason for this could be underreporting as the concept of such a reporting system was new to the health care professionals in this hospital setting. Underreporting, a major draw back of spontaneous ADR reporting, is prevalent even in developed countries with a long history of functional ADR reporting system. A method that could be employed to tackle this problem in a hospital set-up is to increase awareness about an existing system and the advantages of ADR reporting.

A 'Thank You' note to the reporters with additional details educational in nature, periodic dissemination of data on the reported ADRs occurring in the local population are some methods to motivate the health care team to report ADRs. This was a preliminary study in initiating a system of ADR reporting among the health care professionals in the hospital under study.

The causality assessment helped in analyzing the cases and finding the relation between Drug/medication use and the resultant reaction. Causality assessment revealed that most of the ADRs belonged to "possible" followed by "probable" categories, similar to that reported by Murphy *et al*.[4] Severity assessment showed highest percentage of moderate reactions, a finding consistent with the study carried out by Ramesh *et al* [6] and Gholami *et al* .[11]

Medicine department reported the highest number of cases. Most of the patients with ADR were found to be adults as this age group of people visited more to the hospital and may be they are the group of the patients who are exposed to maximum drugs.

Skin was the most affected system found in the reported ADRs as it is the most prominent to vision and easily catches the attention of the patients and physician unlike other systems of the body. Reports were more from the inpatients compared to the out patients and most of them were hospitalized cases due to the reaction itself and females predominated than males may be due to the inability to tolerate to the drugs. Most of the patients reported reactions with blood and drugs like Antibiotics, Antiepileptics, Analgesics & Antipyretics and Antitubercular drugs may be because of their wide prescriptions.

Majority of the ADRs reported due to blood products were Non Hemolytic transfusion reactions

and the others were due to reactions like Hypersensitivity and Drug allergy.

Conclusion

ADRs are the undesirable effects of drugs when used for therapeutic purposes, ADRs cause morbidity and can also cause mortality, so monitoring is important on regular basis. Monitoring is more important, easy and helpful when it is done in a hospital set up. In KIMS, the department of Pharmacy Practice has initiated the ADR reporting and monitoring system and efforts are being made by the department in regularizing the system. This study is a systemic approach in the existing process and emphasizes the importance of ADR monitoring in KIMS hospital. Less number of ADR indicates the problem of under reporting and the reasons for under reporting has to be found and should be worked out to strengthen the process of reporting. This study reveals that awareness has shown a positive influence in the reporting of ADR and continuous motivation through phone calls, thanks giving notes and personal visits will further increase the number of ADR reports. The ADRs reported during the study have been forwarded to the peripheral centre from where this will be forwarded to the higher centres. Any ADRs reported prior to the department were not forwarded to the higher centres. In this direction this study took a lead in establishing such a system.

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