Adverse drug reaction monitoring in a teaching hospital Mandya

Drupad H. S.[1], Nagabushan H.[2], Rajeshwari[3,*]

[1,3]Post Graduate, [2]Professor & HOD, Dept. of Pharmacology, Mandya Institute of Medical Sciences, Mandya, Karnataka, India

***Corresponding Author:**
Email: rajeshwarineela6@gmail.com

Abstract

Objectives:

1. To assess and analyse adverse drug reactions (ADRs) according to reporting and presentation.
2. To describe causality and severity analysis.

Materials and methods: After taking approval from the Institutional ethical committee study was undertaken over a period of one year. A prospective observational study was conducted to monitor the ADRs in all the clinical departments and emergency units of the hospital. The ADRs forms were distributed to all the departments and informed them to report any suspected adverse drug reactions. ADRs were monitored both actively and passively. Reported forms were collected by active surveillance and Causality assessment was done by pharmacologist using Naranjo's & WHO scale and severity by Hartwig's scale respectively.

Results: Total 85 ADRs were reported over a period of year. Most of the ADRs were reported from the ART centers 70.6%. The most common system involved in ADR was haematological system about 29.4% of overall reaction followed by 24.7% dermatological. Zidovudine induced anaemia was the most common ADR. Causality assessed using Naranjo's scale showed that most of reported ADRs were probable 49.4%, 27.1% were doubtful and 23.5% were possible.

Conclusion: Study showed that there was under reporting of ADRs. Most of the cases were reported from ART center. There is a need to improve awareness among the clinicians to emphasize their role in voluntary reporting of ADRs, on generating quality reports, critically monitor the ADRs so as to prevent them further.

Keywords: Adverse drug reaction, Causality assessment, Naranjo scale, WHO scale and Hartwig's scale.

Introduction

The Adverse drug reaction (ADR) is currently one of the most important public health problems all over the world, although public and scientific attention has focused on adverse drug reactions (ADRs) since thalidomide tragedy in the early 1960s. Many of these ADRs are preventable. Identification of it helps in achieving a substantial reduction in health care cost.[1]

Medicines are used generally to treat illnesses as they have the ability to modify the altered physiological processes in the body, at the same time the drugs always carry certain amount of risk in the form of unwanted or unintended effects known as Adverse Drug Reaction (ADR),which is defined as "noxious and unintended response to use of medication, associated with the use of a dose generally used in human beings for prophylaxis, diagnosis and treatment of diseases and/or to change physiologic functions, excluding the cases of therapeutic failure.[2]

Globally physicians are facing problems of adverse drug reaction everyday.[3] ADRs impose a huge social and financial burden on society by adversely affecting the quality of life, leading to hospitalizations, prolonging hospital stay and affecting the survival of patients.[4]

The occurrence of ADRs cannot be prevented but the incidence can be brought down by doing pharmacovigilance or adverse drug reaction monitoring regularly.

Pharmacovigilance is a continuous and ongoing process which collects/collate records, codes adverse events/drug reactions, analyses /assesses the report and creates appropriate system and effective modes of communication needed to ensure patient safety.[5]

Hospital-based ADR monitoring and reporting programmes aim to identify and quantify the risks associated with the use of drugs. This information is useful in identifying and minimizing preventable ADRs and enhancing the knowledge of the prescribers to deal with ADRs more efficiently.[6]

There is lack of monitoring of adverse drug reaction in the health care system. The study was undertaken to monitor the occurrence of adverse drug reaction in our institution. This systematic study in district hospital, Mandya concerning ADRs will help the physicians to gain a working knowledge of these adverse effects, with the ultimate goal of improving the prescription habits and promoting the early recognition and management of adverse effects.

Materials and methods

A prospective observational study was initiated after approval from the Institutional ethical committee. Study was conducted to monitor the adverse drug reaction in all the clinical departments and emergency units. All the subjects with suspected adverse drug reactions in the hospital were included and ADRs reported from other institutions and private hospitals were excluded from the study. It is Observational and Prospective study and study was conducted over a period of 1year. Proactive approach was done to explain the relevance and need of pharmacovigilance

programme, medical fraternity of various departments were encouraged to refer the suspected ADR events to the pharmacovigilance unit. In case of inpatients, inputs were received from the clinical colleagues, which were followed by a personal visit to the ward for evaluation of subjects.The adverse drug reaction forms were distributed to all the departments and informed all the staff members to report any adverse drug reactions. A Circular containing name, phone number and address of pharmacovigilance unit were distributed to all the clinical staff and displayed in all clinical department notice board and were advised to inform all suspected ADRs by phone call or by personal visit. All the clinical staff, pharmacovigilance committee members, nursing staffs, interns and students were constantly instructed to inform the adverse drug reactions. Once the case was informed, ADRs were monitored both actively and passively. ADR forms were collected by active surveillance. Active surveillance was done once in three days for any unreported cases. Filled ADR forms were received either by personal visit to the department or by spontaneous reporting to pharmacovigilance unit.After collecting the ADR form, evaluation of subjects was done by study of available medical record, complete history, general physical examination and systemic examination.

Subjects were evaluated for the temporal association of adverse drug reaction and suspected drug. They were also assessed for adverse event due to any concomitant drug usage, disease or chemicals. Probability and Causality assessment were done using Naranjo's scale and WHO scale and severity by Hartwig'sscale.Patients were followed up to find the outcome of the reaction to judge whether it was fatal, life threatening and even death.

Statistical Analysis

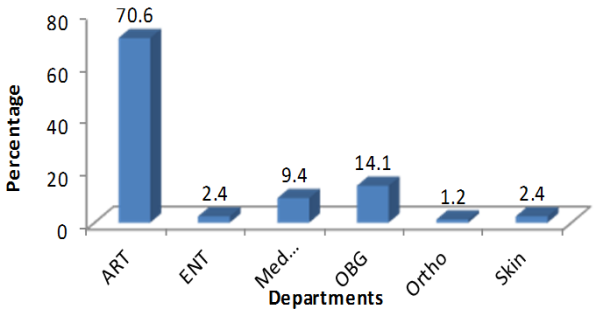
Descriptive statistics, mean, standard deviation, 'chi-square' test and 't' test were applied for analysing the data. Data were analysed using SPSS software version 20, 2015.

Results

Total 85 adverse drug reaction cases were reported over a period of one year. Majority of ADRs were by active surveillance. Among them 44 were females and 41 were males. Age group demographic data showed that majority of ADRs occurred in age group of 21-40 years (total 58 out of 85), next were in age group 41-60 years (24 out of 85).

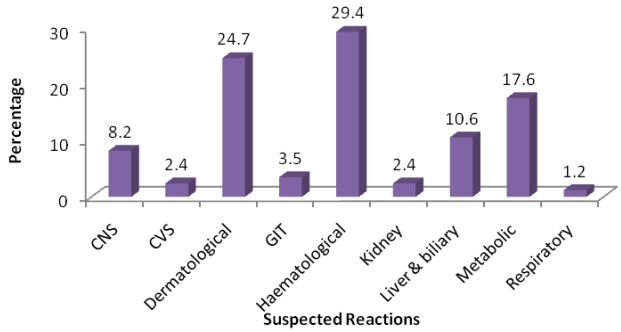
Most of the adverse drug reactions were reported from the ART centres 60 (70.6%) of over all cases. There were 12(14.1%) from department of Obstetrics and Gynaecology, 8(9.4%) cases from department of Medicine, 2 (2.4%) from department of Skin and ENT and there was only one case reported from department of Orthopaedics. (Graph 1)

Graph 1: ADRs from different departments



The most common system involved in adverse drug reaction was haematological system about 25(29.4%) of overall reaction. (Graph 2)

Graph 2: Percentage of suspected systemic reaction



Antiretroviral drugs were the most commonly reported ADRs constituting about 61.2% of overall reported cases followed by vitamins (9.4%), Cephalosporins (5.9%), sulphonamides (4.7%) and NSAIDs (3.5%).

Among the 85 adverse drug reactions, most of the reactions occurred from the anti-retroviral drugs. In the antiretroviral drugs, most common drug encountered was zidovidine followed by niverepine.

Considering the seriousness of reaction among the reported cases, most of the cases were hospitalised (57.6%) and got treated and some of them were treated on outpatient basis (42.4%). On assessing the outcome of the reactions, most of them recovered completely (96.5%). (Table 1)

Table 1: Seriousness and Outcome of the ADRs

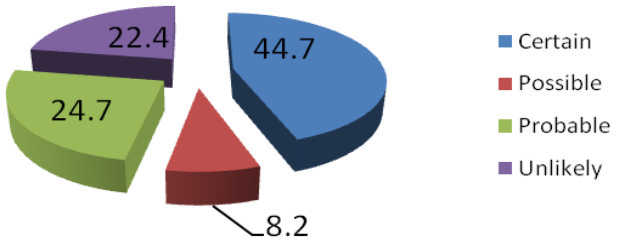
Category	Seriousness of reaction of ADRs		Outcome of ADRs	
	Hospitalised	OPD	Continuing	Recovered
Numbers	49	36	3	82
Percentage	57.6	42.4	3.5	96.5

Table 2: Casualty and probability assessment by Naranjo's scale

Naranjo scale	Numbers	Percentage
Doubtful	23	27.1
Possible	20	23.5
Probable	42	49.4

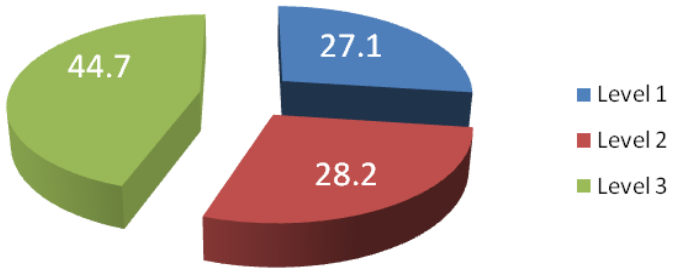
Causality and severity were assessed using Naranjo's scale, WHO scale and Hartwig's scale. Naranjo's scale showed that most of the reported cases were probable 42(49.4%), doubtful 23(27.1%) and possible 20(23.5%). (Table 2)

Graph 3: Casualty assessment using WHO scale



WHO scale showed that most of the reactions were certain 44.7%, followed by probable 24.7%, unlikely 22.4% and possible 8.2%(Graph 3).Severity of the drug reactions was assessed using modified Hartwig's scale showed that majority of them (44.7%) were level 3 (Graph 4).

Graph 4: Severity assessment using Hartwig's severity scale



In Naranjo's causality and probability scale showed there is statistical difference among male and females (p=0.008), out of 44 reported male cases, 16 probable, 10 possible and 18 were doubtful. In females out of 41 reported cases 26 probable, 10 possible and 5 doubtful.

WHO casualty scale also showed that there was a statistical difference among men and women in assessment (p=0.003). Among 44 reported cases, 13 were certain, 6 were probable, 10 were possible and 15 were unlikely and in females out of 41 reported cases

25 certain, 1 probable, 11 possible and 4 unlikely respectively.

Discussion

The present study is a prospective observational study undertaken to monitor the occurrence of ADRs in the institution, to assess the causality and severity of the ADRs in the population using various scales. We also assessed the most common drugs involved in the ADRs and pattern of ADRs.

The demographic data showed that the occurrence of ADRs more between the age group of 21-40 (68.2%) followed by 41-60yrs (28.2%). Previous studies showed that majority of the ADRs occurring between 20 and 60 years of age group.[7]

Our study showed the occurrence of different variety of ADRs, which were reported from the different clinical departments. Out of 85 ADRs, majority were spontaneously reported. From the above result it showed that the numbers of ADRs were very less and there is lack of reporting or underreporting which was similar to earlier studies.[8]

Among the 85 reported cases, more than half of the cases were reported from the ART department (70.6%). Very less number of cases reported from the department of Medicine and Dermatology where the drug usage is more.Even after active surveillances and constant reinforcement for reporting, there were very less incidence of ADRs reporting from the all clinical departments. This may be due to limited drugs, lesser number of drugs, non-availability of newer drugs in the hospital pharmacy and restriction of prescribing drugs outside the hospital pharmacy and may be fear in reporting ADRs, because of ethical and legal issues.

For most of the drugs, dermatological reactions are the more common Adverse Drug Reaction.[9] Previous study also showed that the most common system involved for ADRs was skin and its appendages, but in our study the most common system involved was haematological followed by dermatological system.[7,10,11] In haematological system Anaemia was the commonly reported ADR, the drug was Zidovudine. In dermatological reactions maculopapular rashe were common and caused by drug Nevirapine. The reason for occurrence of more reaction with zidovudine and nevirapine that drugs were part of regimen in treating HIV patients.

According to Naranjo's scale, among the reported cases 49.4% were probable, 23.5% were possible and 27.1% were doubtful when compared to other study which showed that 52 (31.7%) were found as likely/probable and 17(10.3%) cases as possible after proper causality assessment.[12,13] Severity of the ADRs were assessed using Hartwig's scale, showed that 44.7% were Level 3 severity, 28.2% were Level 2 severity and 27.1% were Level 1 severity which was comparable to other study results where 43.7% were mild, 31.25% were moderate and 9.3% were severe.[14]

Outcome of the reaction in our study showed that almost all the cases have recovered completely (96.5%) except three cases which were continuing with the reaction (3.5%) comparing with the other study which showed that 77.48% patients were recovered at the last assessment.[10]

Conclusion

Study has given the initiation for the monitoring of ADRs. Several steps has to be taken towards strengthening the pharmacovigilance activity by doing constant regular meeting with co-ordinators and creating awareness for healthcare professionals by conducting orientation programmes and understanding the need of pharmacovigilance activity in health care to reduce the burden of health cost and better patient management.

References

1. Ahmet A and Sule O. Rational Pharmacotherapy and Pharmacovigilance, Current drug safety 2007;2:65-9.
2. Passarelli MCG, Filho WJ. Adverse drug reaction in elderly patients: how to predict them? Einstein 2007; 5(3):246-51.
3. Oshikoya, Njokanma OF, Chukwura HA, Ojo IO. Adverse drug reaction in Nigerian Children.Pediatric and Perinatal Therapy 2007; 8:81-8.
4. Kumar A. Past, present and future of pharmacovigilance in India. Syst Rev Pharm 2011;2:55-8.
5. Rukari TG, Gavali DK. Pharmacovigilance: An Indian Scenario. Inventi Impact: Pharmacy Practice 2013 .Available from :http://www.inventi.in/Article/ppp/224/13.aspx
6. Van Grootheest K, Olsson S, Couper M, de Jong-van den Berg L. Pharmacists' role in reporting adverse drug reactions in an international perspective. Pharmacoepidemiol Drug Saf 2004;13:457–64.
7. Roy K, Divya S, Nadig P, Prakash B. Monitoring and analysis of adverse drug reactions in a private tertiary care teaching hospital. Asian J Pharm Clin Res 2015;8(2):335-7.
8. Rehman S, QadrieZ.L, Wafai Z.A. Risk Evaluation in Routine Pharmacovigilance Activities inSKIMS: Analysis of3 Years Data. IJPR 2015;5 (3):68-74.
9. Lauraence DR, Bennett PN, Brown MJ. Unwanted effects and adverse drug reactions.Clinical Pharmacology. 8th edn. Churchill Livingstone 1997:121-37.
10. Bhabhor PH, Patel TK, Vahora R, Patel PB, Desai N. Adverse drug reactions in a tertiary care teaching hospital in India: analysis of spontaneously reported cases. Int J Basic ClinPharmacol 2014;3:1078-85.
11. Vijayakumar T.M, Dhanaraju M. D. Description of Adverse Drug Reactions in a Multi-specialty Teaching Hospital.Int. j. integr. med. 2013;1(26):1-6.
12. Surjeet S, Wafai Z.A. Adverse drug reaction monitoring at tertiary care hospital S.K.I.M.S SRINAGAR. JK-Practitioner 2012;17(1-3):58-63.
13. . Kala P, Rani JR, Raja S. A cross sectional study of adverse drug reactions in a tertiary care teaching hospital. Int J Pharm Bio Sci 2015 April;6(2):(P)343–8.
14. Patidar D, Rajput MS, Nirmal NP, Savitri W. Implementation and evaluation of adverse drug reaction monitoring system in a tertiary care teaching hospital in Mumbai, India. Interdisciplinary Toxicology. 2013;Vol. 6(1):41-6.