A Study on Assessment, Monitoring and Documentation of Adverse Drug Reactions

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Research Article

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Abstract

Objectives: Main objectives of the study were to assess the pattern of adverse drug reactions, to monitor and document the reported reactions, to identify the offending drugs and severity of observed reactions and to evaluate the cost.

Method: A prospective observational spontaneous reporting study was carried out for a period of 7 months in an inpatient and outpatient department of a south Indian hospital.

Results: In a total of 103 patients, nearly 53.40 % of patients were male it indicates that the prevalence of ADRs is more in men than in women. 46.60 %, 39.08 % of ADRs were found in the age group between 41 and 60 shows that ADRs in this locality hospital is more in these age group peoples. Naranjo's causality assessment scale shows 39.80 % (41) of ADRs were definite, 34.95 % (36) of ADRs were probable, 22.33% (23) of ADRs were possible and 2.91% (3) were unlikely. WHO probability assessment scale shows 39.80% (41) cases were certain, 34.95% (36) ADR were probable, 17.47% (18) were possible, 2.91% (3) were unlikely, and 4.85% (5) were unassessible. Severity Assessment by Modified Hartwig and Siegel Scale showed that 56.31% (58) ADRs were moderate, 38.83 % (40) ADRs were mild and 4.85% (5) ADRs were severe. No lethal effects were observed. Many of the ADRs were reported from general medicine department (33.98%), it is followed by dermatology department (14.56%) and others. Most commonly identified ADRs was maculopapular skin rashes 28 (27.18%).

Conclusion: Regular monitoring of ADRs is very essential in the day today life to avoid unnecessary exposure of patients to drugs and chemicals. All health care professional should actively participate in the regular monitoring and reporting of ADRs to maintain the good quality of patient's life.

Introduction

The WHO defines an Adverse drug reaction 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 of physiological function. Adverse drug reactions (ADRs) are one of the major causes of iatrogenic disease and are as old as medicine itself. Historically, there are a multitude of examples of patients having come to harm through the use of prescribed medicines. The thalidomide tragedy was one of the worst examples. In healthcare today the risk of ADRs influences every decision to prescribe and, ultimately, take a medicines.[1] Adverse drug reactions can cause negative patient outcomes, increase healthcare utilization, and contribute to rising healthcare costs.[2]

We used the Naranjo's causality algorithm to determine the likelihood of whether an ADR was actually due to drug identified by the clinical event monitor, rather than the result of other factors.[3] Causality assessment is the method by which the extent of relation between a drug and a suspected reaction is established. The most sensitive, powerful and cost-effective system for identification of unknown drug related risk is Spontaneous adverse reaction reporting.[4]

An ongoing ADR-monitoring and reporting program can provide benefits to the organization, pharmacists, other health care professionals, and patients.[5] Educate staff (physician, nurses, etc.) and encourage compliance with the ADR reporting program. Include the importance of ADR reporting, identified trends, common signs and detection tips.

• Develop prospective review systems for reducing ADRs, e.g., target drug projects, residents on high risk medications (warfarin, NSAIDs, etc.), residents

on >5 medications, and routine monitoring of abnormal laboratory values and high-risk patients.
• Provide in-service programs based on identified trends in reporting and appropriate changes in treatment.
• Pharmacists should strive to enhance their knowledge in geriatric Pharmacotherapy.

Direct patient care roles for pharmacists should include patient counseling on ADRs, identification and documentation in the patient's medical record of high-risk patients, monitoring to ensure that serum drug concentrations remain within acceptable therapeutic ranges, and adjusting doses in appropriate patients (eg. patients with impaired renal or hepatic function).[6]

Methodology

The prospective observational spontaneous reporting study was conducted at a 700 bed multi-disciplinary super specialty hospital in South India over a period of 7 months between June 2011 and December 2011. All department of the hospital were included in this study, which has enormous potential of the adverse drug reactions, ethical committee clearance was obtained from the institutional ethical committee. Inpatients, those who were exposed to any adverse drug reactions in the hospital and those who were admitted for the treatment of adverse drug reaction (ie. reason for admission was ADRs), patients who were affected by ADR after hospital admission, and patients who had previous exposure of ADRs were included in the study, Allergic reactions due to pollens, dust and insects are excluded from the study.

Assessment a separate data entry format was specially designed for the study. The drug chart, ADRs algorithm and causality assessment scale were also included in the data entry format. The patients and offending drugs were identified through routine ward rounds and prescription monitoring of all the departments, and the reports obtained from the health care professionals (nurses, doctors etc). Data were collected from patient's case sheet and transferred to data entry format for evaluation.

The collected data's were analyzed by using Naranjo's causality assessment scale, WHO probability assessment scales, Hartwig and Siegel severity assessment scale. The collected data were further analyzed for its appropriateness and suitability and the interpretation was made for the collected data. The suspected ADRs were reported to the regional pharmacovigilance centre and to the peripheral centre.

Results and Discussion

In our study, a total of 103 ADRs were identified out of which 55 (53.40%) patients were male and 48 (46.40%) were female patients. This result is consistent with the result of a study done by Dilip C. (2011) were male (53.49%) patients are more

than female (46.51%) patients.[7] Out of 103 ADRs, 100 (97.08%) ADRs were reported from in-patients department and 3 (2.91%) ADRs were reported from out-patient department. Patients in the age group 41-60 (Mean: 49.36) years experienced maximum ADRs 41 (39.80%), followed by 28 (27.18%) in the age group between 21-40 years, 24 (23.30%) in the 61-80 years age group, 8 (7.76%) in the below 20 years age group, and 2 (1.94%) in the above 80 years age group patients.

This results are consistent with the result of a study done by Rajesh R. (2008), stated that 70% of the patients were fall in the adult category with age group between 19 and 60 years.[8] This is in contrast to a study done by Munir Pirmohamed et. al (2004) in U.K. who has shown a greater number of patients in the age group 65-83 (Mean 76) years.[9]

Table. 1 Naranjo's causality assessment of ADRs (n=103)

S.No.	Types of Causality	No. of ADRs (%)	Sex distribution	
			Male (%)	Female (%)
1	Definite	41 (39.80%)	20 (19.41%)	21 (20.38%)
2	Probable	36 (34.95%)	28 (27.18%)	8 (7.76%)
3	Possible	23 (22.33%)	6 (5.82%)	17 (16.50%)
4	Unlikely	3 (2.91%)	1 (0.97%)	2 (1.94%)

In our study out of 103 patients, 54 (52.42%) patients had previous exposure of ADRs, 26 (25.24%) patients were affected by ADR after hospital admission, while 23 (22.33%) patients required hospital admission due to ADRs. This result is contrast to a study by Rajesh R. (2008), revealed that only 2% of the patients were admitted with previous exposure of ADRs.[8]

Causality assessment was done by using Naranjo's scale. The assessment showed that out of 103 ADRs, 41 (39.80%) ADRs were Definite, 36 (34.95%) were Probable, 23 (22.33%) were Possible and 3 (2.91%) were Unlikely related to drug. This is contrast to the study by Rao PG. (2006) stated that most of the ADRs belongs to possible.[10]

Table. 2 WHO probability assessment of ADRs (n=103)

S.No.	Types of reaction	No. of ADRs (%)	Sex distribution	
			Male (%)	Female (%)
1	Certain	41 (39.80%)	20 (19.42%)	21 (20.38%)
2	Probable/ likely	36 (34.95%)	28 (27.18%)	8 (7.76%)
3	Possible	18 (17.47%)	4 (3.88%)	14 (13.59%)
4	Unlikely	3 (2.91%)	1 (0.97%)	2 (1.94%)
5	Unassessible/ Unclassifiable	5 (4.85%)	2 (1.94%)	3 (2.91%)

The assessment done by using WHO probability Assessment scale revealed that out of 103 ADRs, 41 (39.80%) ADRs were certain, 36 (34.95%) were probably drug related and 18 (17.47%) were possibly drug related, 5 (4.85%) were identified as unassessible/ unclassified and 3 (2.91%) were identified as Unlikely.
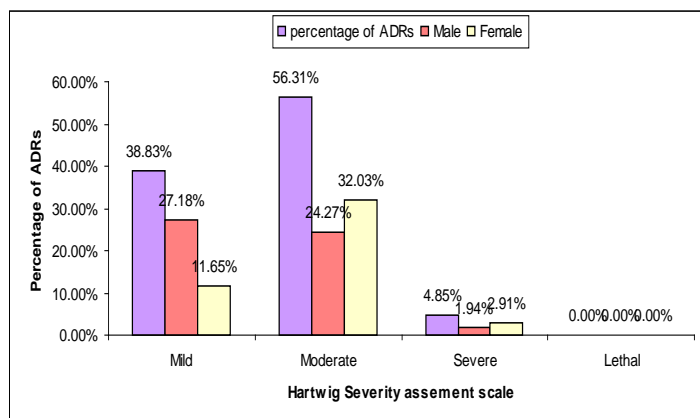
Figure. 1 Hartwig and Siegel severity assessment of reported ADRs

The severity assessment showed that 58 (56.31%) ADRs were Moderate, 40 (38.83%) were Mild and 5 (4.85%) were Severe. No lethal effects was observed or produced. This is contrast to the study by Rajesh R. (2008) stated that majority of the ADRs were mild (54%), followed by moderate (35%) and severe (10.81%).[8]

Most of the ADRs 35 (33.98%) were found in the General Medicine department, which is followed by Dermatology 15 (14.56%), Neurology 15 (14.56%), Pulmonology 8(7.76%), Gynacology 8 (7.76%), Oncology 6 (5.82%), Nephrology 6 (5.82%), Gastrology 6 (5.82%) and

Cardiology was 4 (3.88%). Cutaneous system (Skin) is most commonly affected in our study population, 75 (72.81%) patients had cutaneous reactions, followed by Gastrointestinal tract (GIT) 17 (72.81%), Central Nervous System (CNS) 6 (5.82%) and Cardiovascular system (CVS) 2 (1.94%). This is

contrast to a study done by Subhish P. (2008) has shown that 22 systemic ADRs, the system most badly affected was the GI system 6 (27.27%) followed by CVS 5(22.73), Immune system 3 (13.63%) and CNS 2 (9.09%).[11]

Figure.2 Classification of observed reactions from reported ADRs (n=103)
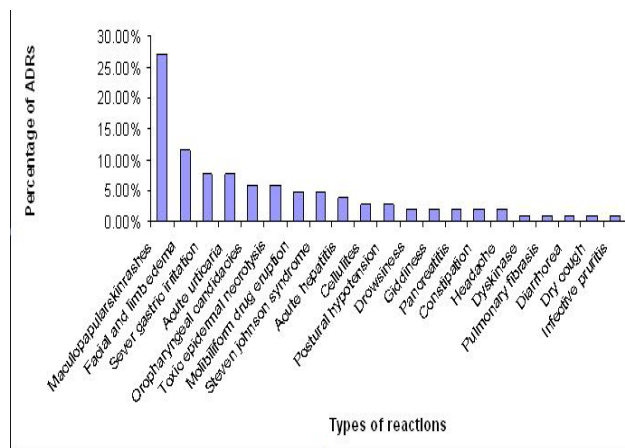
The most commonly identified adverse drug reaction was Maculopapular skin rashes in 28 (27.18%) cases followed by Facial and limb oedema in 12 (11.65%) patients, severe gastric irritation in 8 (7.76%) patients, acute urticaria in 8 (7.76%) patients, oropharyngeal candidacies in 6 (5.82%) and toxic epidermal necrolysis in 6 (5.82%) patients, morbiliform drug eruption in 5 (4.85%) patients and Steven Johnson syndrome in 5 (4.85%) patients etc. In our study, regarding ADRs associated drugs it was found that ADRs were most commonly associated with Antibiotics in 23 (22.33%) patients and NSAIDs in 18 (17.47%) patients while other drugs classes were associated such as Antibacterial 11 (10.67%), Anticonvulsants 9 (8.73%), Antileprotic and sulpha drugs 9 (8.73%), Anti neoplastic drugs 5 (4.85%) and Opiod analgesics 5 (4.85%) etc. This is similar to a study by Rajesh R. (2008) noted that Antibiotics caused maximum ADRs 76 (24%), Antitubercular 74 (23%), NSAIDs 60 (19%), Antiepiletic 26 (8%), which is followed by Antimalarial 09 (3%) and Antidiabetics 04 (1%).[8]

In our study, in 99 (96.11%) cases the drug was withdrawn and dose was altered in 4 (3.88%) patients. Symptomatic treatment was given to 87 (84.46%) patients; specific treatment was given to 4 (3.88%) patients and no change in the treatment in 12 (11.65%) patients. Adverse drug reactions were encountered with treatment and the final out come was measured, all 103 (100%) patients were recovered. No fatalities were reported. This is contrast to a study by Munir Pirmohamed (2004)

stated that 23% of the patients died due to direct result of the ADRs.[9]**.** Out of 103 ADRs only 33 patients had treated, the total medicine cost worth Rs. 8,082 was spend in the management of 33 ADRs during the study period. The average cost was Rs. 244.91. It underlines the fact that ADRs pose an extra burden to the patient, because this ADRs treatment cost was an additional cost incurred by the patients in addition to the normal treatment cost.

Conclusion

ADRs are the leading cause of morbitity and mortality. ADRs have been estimated to amount for up to 1,06,000

deaths annually in the united states. ADRs that was associated with high direct cost, mostly due to extended hospitalization. Pharmacovigilance is not properly developed in our country. In order to minimize the problem associated with ADRs, it is suggested that every hospital should have pharmacovigilance center involving all Health Care Professionals (HCP). This result suggests that patients do not report all symptoms they suspect to be ADR, to their HCP and that HCP do not record all symptoms which may be reported to them. The monitoring tool proved to be an effective tool for educating HCP in the importance of monitoring for adverse drug reactions.

Acknowledgement

References

1. Edwards RI, Aronson JK. Adverse Drug reactions: definitions, diagnosis, and management. The Lancet 2000;356:1255-59
2. Reith, Charlene H. Identifying predictors of adverse drug reactions and associated costs using a claims database. 2002:218. Available from: http//oai.dlic.mil/oai
3. Naranjo CA, Busto U, Sellers EM, et al. A method for estimating the probability of adverse drug reactions. Clin Pharmacol Ther 1981;30(2):239–45.
4. http://www.pharmacovigilance.co.in/casualityassesment.html
5. Medication misadventures- ASHP guidelines on ADRs monitoring and reporting. Available from: http:www.ashp.org/s_ashp/docs.
6. Nebeker JR, Barach P, Samore MH. "Clarifying adverse drug events: a clinician's guide to terminology, documentation, and reporting". Ann Intern Med 2004;140(10):795–801
7. Dilip C, Lisa Mari and Saraswathi.R et.al. Adverse drug reactions monitoring in tertiary level hospital, Perithalmanna, Kerela. Indian journal of hospital pharmacy 2011;48:107-111.
8. Rajesh R, Ramesh M and Parthasarathi G. A study on adverse drug reactions related hospital admission and their management. Indian journal of hospital pharmacy 2008;45:143-148.
9. Munir Pirmohamed**,** Sally James**,** Shaun Meakin**,** et.al. Adverse drug reactions as cause of admission to hospital: prospective analysis of 18,820 patients. BMJ 2004;329:15-19.
10. Rao PG, Archana B, Jose J. Implementation and results of an adverse drug reactions reporting programme at an Indian teaching hospital. Indian Journal Pharmacology 2006;38:293-296.
11. Subish P, Mishra P and Shankar PR. Systemis Adverse drug reactions: A preliminary report from the regional pharmacovigilance center, Western Nepal. Pak J Pharm Sci 2008;21(4):465-467.

AUTHORS' CONTRIBUTIONS

Authors contributed equally to all aspects of the study.

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CONFLICTS OF INTEREST
The authors declare that they have no competing interests