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ANALYSIS OF ADVERSE DRUG REACTIONS REPORTED IN A TERTIARY CARE HOSPITAL

VARSHA RAMESH[1*], VASANTHI.C[2] AND DARLING CHELLATHAI DAVID[3]

*[*1]3rd year Post-graduate, Dept. of Pharmacology, SRMC&RI, Chennai*
[2]Professor, Dept. of Pharmacology, SRMC&RI, Chennai
[3]Professor and HOD, Dept. of Pharmacology, SRMC&RI, Chennai.

ABSTRACT

Adverse Drug Reactions (ADRs) are an important cause of morbidity and mortality all over the world. This study aims at collecting and analysing Adverse Drug Reactions in a tertiary care hospital. This is a retrospective observational study, done at Sri Ramachandra Medical College Hospital, a tertiary care hospital over a period of 6 months. These ADRs were reported by the medication safety team of our hospital in CDSCO ADR forms of PvPI. The collected ADRs were subjected to WHO causality assessment scale by Pharmacology department. The causalities and other aspects of the ADRs were analysed in detail by us. A total of 118 ADRs were reported during this study period. Antibiotics contributed to the maximum number of ADRs which accounted for 67.80% of the total, followed by Analgesics and Iron containing preparations which accounted for 8.5% of the total ADRs. Causality assessment of ADRs by WHO scale showed that maximum reactions were categorized as Probable (61.86%) followed by the possible category (34.74%). The most common mode of presentation was itching followed by pruritic rash. One case of Norfloxacin induced Steven Johnson Syndrome was reported. One case of reaction to Iomeron contrast dye was also reported. Antimicrobial classes of drugs contributed to the maximum causative agents for ADRs, followed by analgesics and Iron containing preparations. Steroids, Ranitidine and Cardiovascular drugs contributed to a small percentage of ADRs during this period. The majority of ADRs were probable on WHO assessment scale.

KEYWORDS: *Adverse reaction, morbidity, mortality, antibiotics, causality*

VARSHA RAMESH*

3rd year Post-graduate, Dept. of Pharmacology, SRMC&RI, Chennai

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INTRODUCTION

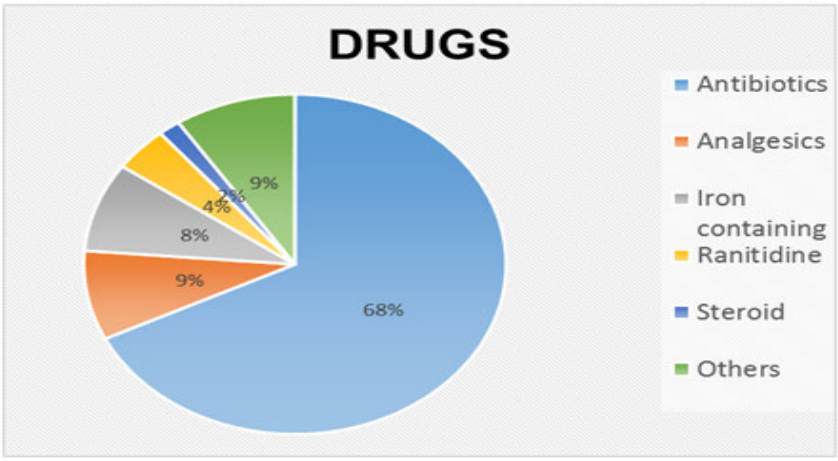
Adverse drug reaction is a noxious and unintended response to a drug that occurs at doses normally used in man for prophylaxis, diagnosis or therapy of disease or the modification of physiological function. ADRs are a threat to the patient and the quality of life and they increase the health care cost considerably. Around 6% of hospital admissions are due to ADRs and about 6–15% of in-patients experience a serious ADR.[1]Reporting of ADRs has become a vital part of monitoring and evaluation.[2]In 2010, Central Drugs Standard Control Organization (CDSCO) under the Ministry of Health and Family welfare and Phamacovigilance Programme of India (PvPI) has established adverse drug reaction monitoring centres at various sites in India.[3] Periodic evaluation of ADRs reported in a hospital helps in designing the pattern of ADRs and thereby helps to improve the safety of drug use in the hospital set up. The ADRs are subjected to causality assessment according to one of the scales; WHO causality assessment scale and Naranjo scale. The modified Hartwig and Siegel scale is routinely used for severity grading. These would in turn help in ensuring better health care practices. A lot of newer drugs in the market has increased the necessity of ADR monitoring after the regulatory approval of the product.[4] Spontaneous reporting program, a common method of drug surveillance is capable of recognizing ADRs in the daily medical practice, even though underreporting and absence of information on number of people actually exposed to the drug are its disadvantages. The primary purpose of spontaneous adverse drug reaction reporting is to provide early warnings of unwanted effects that can occur with a drug, which have not been recognized prior to marketing of the drug because of short-comings of clinical trials.[5] Data generated from a hospital set up further contributes to the national and international databases on ADRs. The outcomes of educational interventions to increase reporting among physicians have been studied.[6] Despite various measures taken to control the occurrence of ADRs, the rate of preventable ADRs still remains high.[7] Aim of this study is to retrospectively analyse the adverse drug reactions in in-patients of a tertiary care centre and to assess causality of the ADRs.

METHODOLOGY

The study was approved by the Institutional Ethics committee. This is a retrospective study which analyzes the ADRs in in-patients of Sri Ramachandra Medical College Hospital for a period of 6 months (July 2015 to Jan 2016). The ADRs were collected from ADR monitoring centre under PvPI. The ADRs were reported by the medication safety team of our hospital in CDSCO ADR forms of PvPI from the respective wards. Details such as the reaction event, duration of the event, mode of presentation, temporal relationship, other suspected drugs and their dose and route, concomitant medications, batch number and expiry date of the suspected medications and details about recovery, dechallenge and rechallenge were collected. Causality assessment of the ADRs was done by Pharmacology department according to WHO causality assessment scale into certain, probable, possible, unlikely and unclassifiable. They were then entered in to Vigiflow and sent for Central Assessment to the National Coordination Centre located in Ghaziabad, New Delhi where the cases are further compiled and analysed. This study included patients of all age groups and reactions of all types and severity.

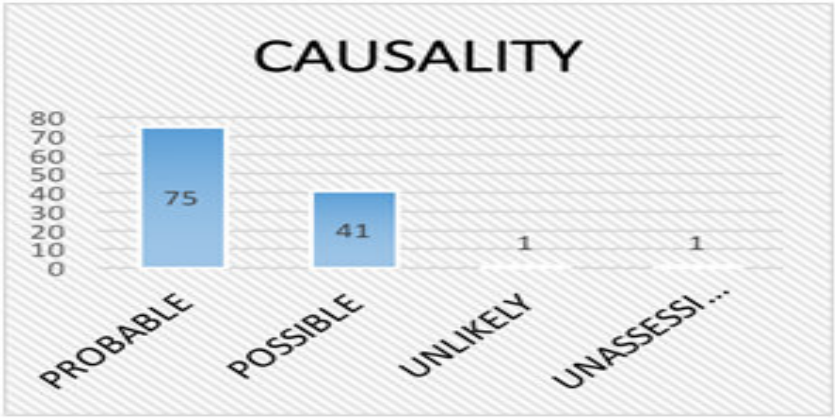
RESUTS

The data were analysed using SPSS-15 and presented as actual numbers and frequencies. A total of 118 ADRs were reported during this study period. 80 of this were due to Antibiotics which contributed to the maximum number of ADRs. They accounted for 67.80% of the total. This was followed by Analgesics and Iron containing preparations which accounted for 8.5% of the total ADRs each (Figure 1).The 21 to 30 year age group contributed to maximum number of ADRs (33.8%), followed by the 31-40 and 41-50 year age groups which contributed to 17.8% each. Most reactions were due to an intravenous injection. Causality assessment of ADRs by WHO scale showed that maximum reactions were categorized as Probable or likely (61.86%) followed by the possible category (34.74%) (Figure 2). The most common mode of presentation was itching followed by pruritic rash. A few cases of anaphylaxis were also reported. Other less common modes of presentation were vomiting, diarrhea, giddiness and raised Renal function test (Figure 3). Cutaneous reactions were most common followed by involvement of GIT. One case of Norfloxacin induced Steven Johnson Syndrome and one case of Steroid induced myopathy were reported. One case of reaction to Iomeron contrast dye was also reported which presented as periorbital edema and rash. A case of Nicolau syndrome (Iatrogenic cutaneous necrosis) due to Diclofenac sodium was reported. Most of the reactions were not severe and required no or minimum intervention to subside. In our study most of the reactions were Type B (Bizarre effects).



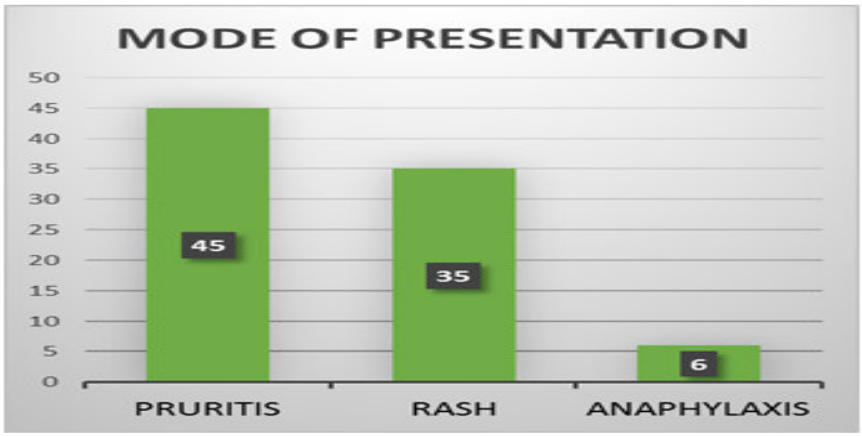
The number of adverse drug reactions caused by antibiotics were much higher than the adverse drug reactions caused by all other drugs combined.

Figure 1
Drugs causing ADR



75% of the reactions were classified as Probable. No reaction was graded as certain.

Figure 2
Causality assessment



Isolated pruritis occurred in most patients as a reaction to drug and most of them settled spontaneously. Most rashes presented as erythematous lesions.

Figure 3
Mode of presentation

DISCUSSION

Antimicrobial class of drugs were the maximum causative agents for ADRs, followed by analgesics and Iron containing preparations. Currently those amongst the antibiotics reported to cause maximum ADRs in India are Penicillins, Cephalosporins & Fluoroquinolones.[8] In our centre Fluoroquinolones accounted for the majority of cases due to antibiotics (48.75%), followed by Cephalosporins (31.25%). This

inference could be due to the wide usage of Fluoroquinolones in our hospital set up as well as antibiotic prescription in general for maximum number of in-patients. Other antibiotics which contributed to this subset of ADRs were Amoxicillin with Clavulanic acid, Piperacillin Tazobactam, Azithromycin and Amikacin. The usage of these compounds were also relatively less when compared with Fluoroquinolones and Cephalosporins. Inappropriate injection techniques like fast administration via the intravenous route and wrong site of injection via the intramuscular route etc. can also lead to various adverse reactions.[9] Steroids, Ranitidine and Cardiovascular drugs contributed to a small percentage of ADRs during this period. The majority of ADRs were probable on WHO assessment scale showing that a temporal relationship was present to the administration of drug and the occurrence of reaction, making it possible to attribute most reactions to one particular drug. No reaction was graded as Certain. Most of the obvious cutaneous reactions are reported spontaneously. Reactions like exacerbation of normal pharmacological response and certain rare adverse effects of the drug are not reported. Hence, reporting of any suspected event due to any drug should be encouraged, even when there is more than one drug suspected to cause the adverse reaction. In future we aim at doing analysis targeted towards ADRs caused by antimicrobial classes of drugs specifically so that we can minimize and prevent the occurrence of ADRs overall.[10] Better education of health care personnel regarding monitoring ADRs with special emphasis on administration techniques and the importance of test dose etc. will play an important role in minimizing ADRs. In addition, physician awareness regarding monitoring and reporting of these events is equally important. Spontaneous reporting will be of utmost value in contributing to the reporting of adverse drug reactions.[11] Above all, the quality of data reported plays a major role in steps taken to curtail ADRs. Missing data is a barrier to effective control of ADRs as much as is under-reporting.[12] Many of the label changes for certain drugs has been possible because of such ADR monitoring programs. This can further be potentiated by increasing awareness regarding reporting of an ADR.

CONCLUSION

In our study maximum number of ADRs were caused by antibiotics which correlates with previous other studies. Further studies are required to conclude if this pattern is due to the vast usage of antibiotics or they are actually prone to cause reactions. No reaction was graded as certain because classifying a reaction as Certain requires fulfilling the rechallenge criteria, which is routinely not practised at our institution. Hence, with further monitoring, problems can be identified and resolved resulting in continuous improvement in patient care. This will ultimately contribute to drug safety decision-making and may help product label revision after the product has entered the market. Hence, Pharmacovigilance is necessary and important in the development and commercialization of medicinal products.

CONFLICT OF INTEREST

Conflict of interest declared none.

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Reviewers of this article

Raja Chakraverty

Assistant Professor,
Bengal School of Technology,
Sugandha, Hooghly - 712102, West Bengal, India.

Dr. D. Anusha, MBBS, M.D Pharmacology

Associate Professor, Dept. of Pharmacology, Sri Ramachandra Medical College & Research Institute, achandra Medical College & Research Institute , Porur, Chennai

Prof.Dr.Prapurna Chandra Rao

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