



## RESEARCH ARTICLE

# A study on prospective monitoring of adverse drug reactions associated with hematinics at a tertiary care teaching hospital

P. Vinay <sup>a</sup>, P. Venkata Ramana <sup>b</sup>, B. Jaya Kiran <sup>a</sup>, K. Meghana <sup>a,\*</sup>, N. Vineetha <sup>c</sup>

<sup>a</sup> Department of General Surgery, Government medical College, Kadapa, Andhra Pradesh, India-516217.

<sup>b</sup> Department of Pharmacology, Sri Ramachandra Medical College & Research Institute, Chennai, Tamil Nadu, India-600116.

<sup>c</sup> Department of Obstetrics & Gynaecology, Government Nursing College, Tirupati, Andhra Pradesh, India-517507.

## ARTICLE INFO ABSTRACT



Received 04 December 2020;  
Revised 25 January 2021;  
Accepted 20 February 2021.

### Keywords:

Pharmacovigilance,  
adverse drug reactions,  
hematinics, prospective  
study, spontaneous  
reporting.

**Introduction:** Adverse reactions are the documented hazards of drug treatment and they can happen with any class of drugs and several studies exposed that the incidence is increasing with blood and blood products.

**Objectives:** The main aim of this study is to identify and analyze Adverse Drug Reactions with Hematinics in a tertiary care hospital.

**Methods:** This prospective observational study was conducted for a period of 6 months.

**Results:** A total of 29 ADRs were reported during the study period with a female high proportion (79.31%), more amounts of ADRs were from Obstetrics & Gynecology and General Medicine in which the mainly affected organ systems were the skin (86.20%) and the GIT (13.79%). The hematinics mostly accounted were Iron sucrose (44.82%) followed by ferric carboxy maltose (37.93%) and Iron dextran (17.24%) in which type B reactions were more compared to type A and 72.41% of them were unpredictable. The severity assessment revealed that the majority of them were moderate reactions (62.06%). Out of the reported reactions, 58.62% were definitely preventable and a causality assessment was done which showed that 68.96% of the reactions were probable, possible (20.68%) and conditional (10.34%). Most of the patients (65.51%) were treated with Antihistamines & corticosteroids, with only anti-histamines (24.13%) and no treatment (10.34%).

**Conclusions:** The study concludes that Adverse Drug Reactions with Hematinics are increasing in recent days. Better vigilance is necessary for the implementation of safe and effective treatment with hematinics for each and individual patient.

An official publication of Global Pharmacovigilance Society.

## Introduction

Pharmacovigilance is defined as the science and activities describing to the detection, assessment, understanding, and prevention of adverse effects or any other possible drug-related problem, particularly long-term and short term adverse effects of medicines (Gupta *et al.*, 2011).

Pharmacovigilance aims at creating the best use of medicines with the help of high-class data gathered through a reporting method. Good quality Pharmacovigilance helps in the reducing or prevention of ADRs through early identification and effective communication, which eventually help out all patients to



### \* Corresponding Author

K. Meghana

E-mail: [drmkommu@gmail.com](mailto:drmkommu@gmail.com)

Contact: +919492753795

\* Copyright: 2582-7235 // © 2021 The Author(s).

Published by Global Pharmacovigilance Society.

This is an open-access article under the [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).



Available online 1 March 2021

obtain best therapy. It can create evidence that will motivate public assurance and trust in drugs (Mohanta *et al.*, 2016). The growth of drugs in the last decades has brought extraordinary benefits for the patients, on the same time the occurrence of Adverse Drug Reaction (ADR) has raised surprisingly (Nour *et al.*, 2019). ADR is known as a response to a medicinal product which is noxious, unintended and which occurs at doses normally used in man for prophylaxis, diagnosis or therapy of disease or for the restoration, correction or modification of physiological function". It is generally accepted that "No drug completely free from side effects". It is estimated that ADRs are the fourth to the sixth leading cause of death (Thomas *et al.*, 2018). Healthcare professionals play a vital job in the Pharmacovigilance structure. They require great awareness and knowledge in the field of medication safety which will effectively contribute to this area through early detection, management and reporting of the medicine safety issues. Moreover, the healthcare professionals should be well skilled about the necessity and procedure of adverse event reporting. They should possess a combination of training and research skills in this area. Despite global concerns against medication safety, there is a lack of awareness and knowledge of Pharmacovigilance and ADR reporting among healthcare professionals yet. Moreover, recent studies have indicated that ADRs are poorly reported by healthcare providers, particularly in rising countries (Haines *et al.*, 2020). It is greatly suggested that healthcare professionals including physicians, pharmacists, and nurses report any suspected adverse reaction mostly those suspected reactions to newly approved medicines and serious events. Therefore, the medicine safety evaluation must be considered an important part of daily clinical practice for healthcare professionals. Spontaneous adverse reaction reporting is the major backbone of Pharmacovigilance and is requisite to generate hypotheses about possible harms of drugs that require further assessment. Spontaneous reporting is highly helpful in identification of very rare or delayed reactions that could not be detected during the short period of the clinical trial. The safety of a medicine could be investigated after its approval and throughout its life cycle by using spontaneous reporting tool (Sriram *et al.*, 2019). The awareness and perception of healthcare professionals toward safety profile of drugs is essential. Healthcare professional should observe that no drug is totally or completely safe for all people, in all places, at all times. They should always practice with various measure of improbability (Amrita *et al.*, 2012).

Hematinics are the drugs which progress the quality of the blood, raising the haemoglobin level and the amount of erythrocytes. They are used in the management of anaemia's. Hematinics can be given as oral and parenteral supplements. The adverse effects associated with oral iron are epigastric pain, nausea, bloating, staining of teeth, metallic taste. Parenteral iron therapy is given when there is severe deficiency with chronic bleeding and in cases

where oral iron is not tolerated. The advantage of parenteral iron therapy is iron stores can be replenished in shorter time (Jayesh *et al.*, 2016). Various types of parental iron preparations were Iron dextran, Ferric carboxy maltose, ferrous sucrose, Iron isomaltose. The adverse effects include pain at the site of injection, skin pigmentation, fever, headache, joint pain, palpitations and dyspnea. It is estimated that globally 16,000 deaths and in India 10,000 deaths every year as a result of haematinics induced gastric perforations, obstructions, ulcers and others. It is very important and useful to have detailed knowledge regarding ADRs due to haematinics. Therefore, haematinics wellbeing monitoring is a crucial element of the healthcare system and for high-quality patient care (Maysa *et al.*, 2015).

### Materials and Methods

This prospective observational study was conducted for a period of six months in General medicine, Obstetrics & Gynecology, General surgery departments at Government general hospital, Kadapa. A total of 29 ADRs were reported during study time by using study materials like Suspected ADR reporting form designed by NCC-PVPI, Hartwig and Siegel Severity Assessment Scale, WHO Causality assessment scale, Modified Schumock and Thorn-ton scale. The ADRs were analysed for their seriousness, severity, causality, preventability and predictability. The seriousness of ADRs was assessed with PvPI criteria. The severity of the reaction was determined and categorized as per the classification system of Hartwig and Siegel Severity Assessment Scale. Causality to found the relationship between the drug and reaction by using WHO Causality assessment scale. Preventability was assessed with the classification system of modified Schumock and Thorn-ton scale.

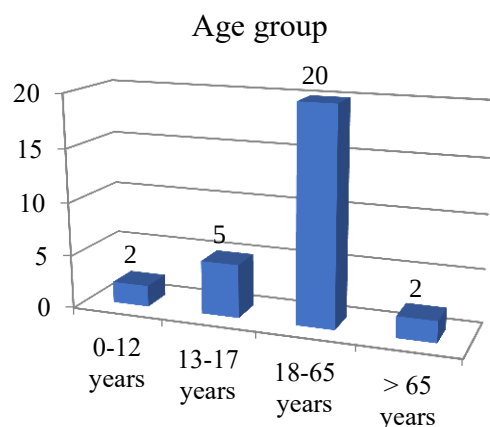
### Results

An overall of 29 adverse drug reactions were analyzed throughout the study time.

#### Distribution of patients based on age

Out of 29 patients, 2 (6.89 %) patients were from paediatrics age group (0-12 years), 5 (17.24 %) patients from adolescent age group (13-17 years), 20 (68.96 %) patients are adult age group (18-65 years) and 2 (6.89 %) from geriatric age group (> 65 years) which are showed in

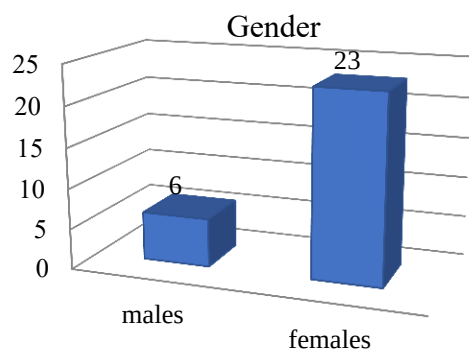
**Figure 1.**



**Figure 1:** Patient distribution based on age

#### Distribution of patients based on gender

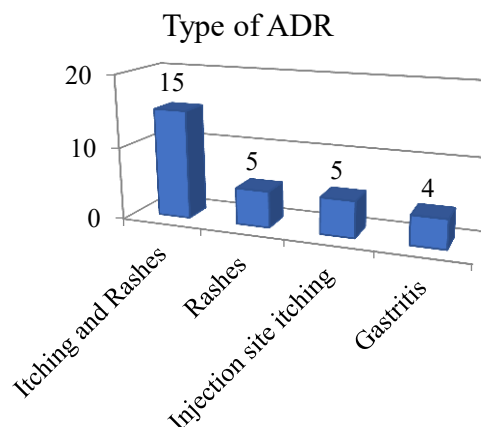
Out of 29 ADRs, 23 (79.31 %) patients developed ADRs were females and 6 (20.68 %) patients developed ADRs were males which are showed in **Figure 2**.



**Figure 2:** Patient distribution based on Gender

#### Distribution of patients based on ADR

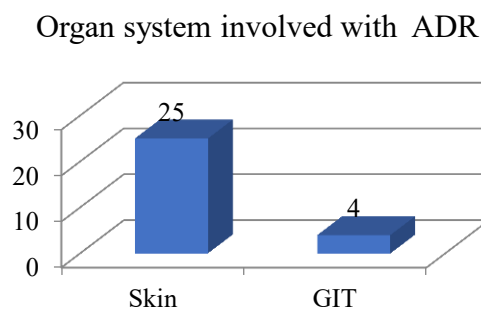
Out of 29 ADRs 4 (13.79 %) ADRs were Gastritis and 15 (51.72 %) ADRs were Itching and Rashes, 5 (17.24 %) ADRs were only rash, 5 (17.24 %) ADRs were Injection Site Itching which is showed in **Figure 3**.



**Figure 3:** Patient distribution based Type of ADR

#### Distribution of patients based on System involved with ADR

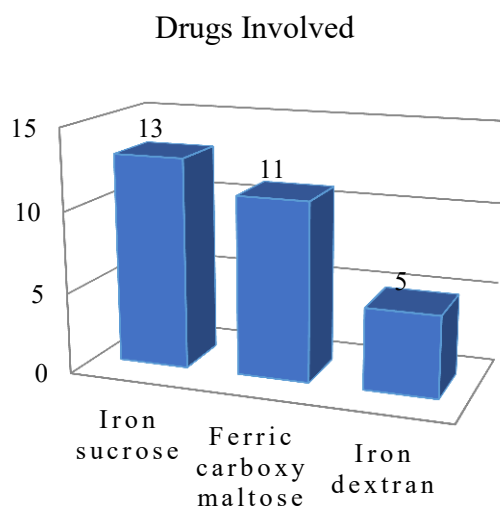
Out of 29 ADRs 4 (13.79 %) ADRs were relating to the GIT and 25 (86.20 %) ADRs were relating to the organ skin which is showed in **Figure 4**.



**Figure 4:** Patient distribution based on organ system involved

#### Distribution based on the drugs involved

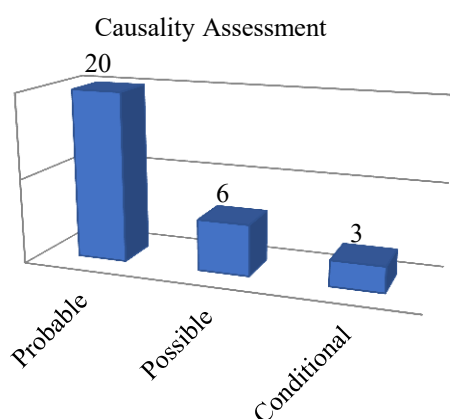
Out of the 29 ADRs, 13 (44.82 %) occurred with iron sucrose, 11(37.93 %) with ferric carboxy maltose and 5 (17.24 %) with iron dextran which are showed in **Figure 5**.



**Figure 5:** Patient distribution based on Drugs involved

**Distribution based on the causality assessment**

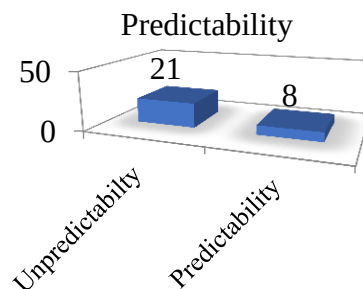
Out of the 29 ADRs, 20 (68.96 %) were probable, 6 (20.68 %) were possible and 3 (10.34 %) were conditional which are showed in **Figure 6**.



**Figure 6:** Patient distribution based on causality assessment

**Distribution based on Predictability**

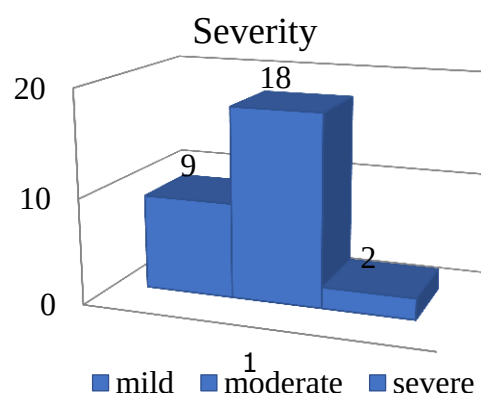
Out of the 29 ADRs, 21 (72.41 %) ADRs were unpredictable and 8 (27.58 %) ADRs were predictable which are showed in **Figure 7**.



**Figure 7:** Patient distribution based on Predictability

**Distribution based on Severity**

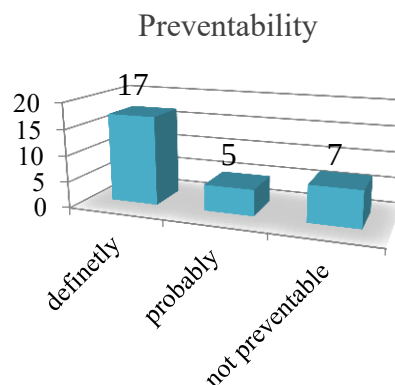
Out of 29 ADRs, 18 (62.06 %) ADRs were moderate, 9 (31.03 %) ADRs were mild and 2 (6.89 %) ADRs were severe which are showed in **Figure 8**.



**Figure 8:** Patient distribution based on severity

**Distribution based on Preventability**

Out of the 29 ADRs, 17 (58.62 %) ADRs were definitely preventable, 7 (24.13 %) ADRs were not preventable and 5 (17.24 %) ADRs were probably preventable which are showed in **Figure 9**.

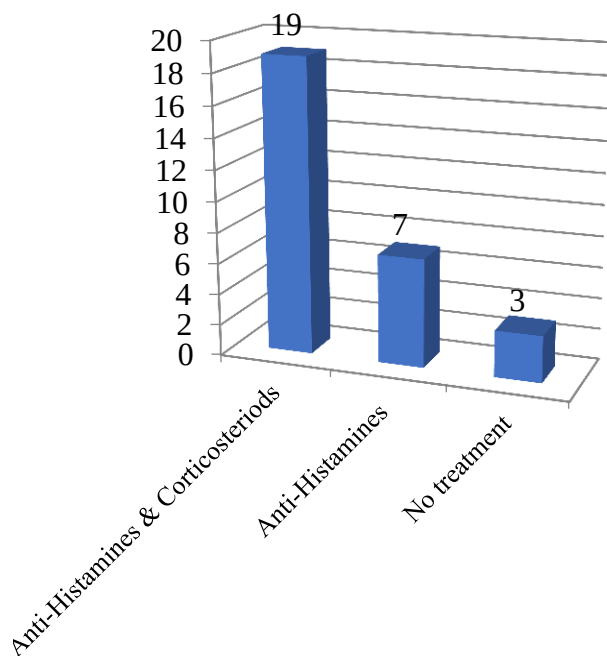


**Figure 9:** Patient distribution based on Preventability

**Distribution based on treatment given to treat reaction**

Out of the 29 ADRs, 19 (65.51 %) patients were treated by Anti-histamines & Corticosteroids, 07 (24.13 %) patients were treated only by Anti-Histamines, and 03 (10.34 %) patients were not treated with any drugs which are showed in **Figure 10**.

Treatment given for treating ADRs



**Figure 10:** Patient distribution based on Treatment given to treat ADR

### Discussion

In pharmacotherapy the drugs have dual effects which are beneficial as well as adverse effects. Drug safety monitoring is a necessary constituent of the healthcare scheme and also for high-quality Patient care ([Ratan et al., 2017](#)).

We found significant variation in the incidence of ADRs with Hematinics among females (79.31 %) and males (20.68 %) Studies conducted in India by ([Lihite et al., 2017](#)) reported more ADRs with Hematinics in females compared to males.<sup>11</sup> the occurrence of ADRs was more in adult people than other age group people. Majority of the ADRs were related to the skin than GIT and others, which includes Itching and Rashes (51.72 %), Rashes (17.24 %), Injection site itching (17.24 %) and gastritis (13.79%). ([Sneha et al., 2016](#)) conducted observational study in India also reported that the majority of the ADRs with Hematinics were affecting skin.<sup>12</sup> Majority of the ADRs i.e. 13 (44.82 %) were occurred with iron sucrose, 11 (37.93 %) were with ferric carboxy maltose and 5 (17.24 %) were with iron dextran. Causality assessment is necessary to confirm whether the reaction is

with drug alone or other factors also involved in ADR occurrence, causality assessment was performed by WHO-UMC causality assessment scale and found that the more of ADRs were probable, ([Visacri et al., 2015](#)) conducted a study in South Indian tertiary care teaching hospitals, have also reported that the majority of the reported ADRs were probable with WHO scale. Evaluation of severity is also necessary to take appropriate action against the drug withdrawal decision, in our study many of the ADRs were moderate and luckily, the frequency of severe ADRs is low, as in the case of parallel studies evaluated by other researchers. Preventability estimation helps in improving rational drug use. In our study, the bulk of ADRs were of definitely preventable, which indicates that appropriate history taking and individualized drug treatment can reduce these ADRs and the majority of the patients were illiterates and they have not maintained their medical records correctly and also they were ignorant of their earlier ADR occurrence. Other research studies performed in India have also reported that the prevalence of definitely preventable ADRs is more. In our study we found that, 21 (72.41 %) ADRs were unpredictable and 8 (27.58 %) ADRs were predictable. In our study out of the 29 ADRs, 19 (65.51 %) patients were treated with Anti-histamines and Corticosteroids, 07 (24.13 %) patients were treated only with Anti-Histamines, 03 (10.34 %) patients were not treated with any drugs.

### Conclusions

Adverse drug reactions with hematinics are increasing in recent days. Better vigilance is necessary for implementation of safe and effective treatment for each and individual patient. In-order to prevent serious adverse drug reactions with hematinics close monitoring during treatment course, creating awareness, recognition of the problem and careful management is necessary. The health care system should encourage the spontaneous reporting of adverse drug reactions to hematinics, proper documentation and intermittent reporting to pharmacovigilance centers to make certain drug safety. Monitoring and reporting of suspected ADRs by health care professionals will provide better patient care.

### Conflict of interest

No conflict of interest

### References

- Amrita, P., Simar, P. S., Vineet, K. (2012). Status of adverse drug reaction reporting by health care professionals of Delhi. *Indian journal of pharmacy practice*, 5(4), 42-50.
- Gupta, S. K. (2011). Text book of Pharmacovigilance. 1<sup>st</sup> edition. *Jaypee Publishers*, 213-219.
- Haines, H. M., Meyer, J. C., Summers, R. S., & Godman, B. B. (2020). Knowledge, attitudes and practices of health

care professionals towards adverse drug reaction reporting in public sector primary health care facilities in a South African district. *European journal of clinical pharmacology*, 76(7), 991–1001.

Jayesh, K. M. R., Kajal, S., Srivastav, A. K. (2016). Pharmacovigilance: a review article. *Innovative journal of medical sciences*, 4(5), 6-7.

Lihite, R. J. (2017). A study on adverse drug reactions in a tertiary care hospital of Northeast India. *Alexandria journal of medicine*, 3(1), 151-156.

Mohanta, G. P. (2016). Text book of Pharmacovigilance- Concepts and practices. 1<sup>st</sup> edition. Pharma med press, 2016, 23-29.

Nour, S., Plourde, G. (2019). Chapter-2 Pharmacovigilance. *Pharmacoepidemiology and pharmacovigilance*, 5(3), 7-23.

Ratan, J. L., Mangala, L., Sukirti, D. (2017). A study on adverse drug reactions in a tertiary care hospital of northeast India. *Alexandria journal of medicine*, 3(1), 151-156.

Sneha, G., Sowmya, N., Prem, K. G. (2016). An observational prospective study on prevalence and monitoring of adverse drug reactions in tertiary care teaching hospital. *BJPR*, 1(2), 01-09.

Sriram, S., & Dinu, C. (2019). Role of Healthcare Professionals in Reporting Adverse Drug Reactions & Monitoring and Documentation of Suspected Adverse Drug Reactions. *International journal of pharmaceutical science invention*, 8(2), 18-39.

Suyagh, M., Farah, D., & Abu Farha, R. (2015). Pharmacist's knowledge, practice and attitudes toward pharmacovigilance and adverse drug reactions reporting process. *Saudi pharmaceutical journal : SPJ : the official publication of the Saudi Pharmaceutical Society*, 23(2), 147–153.

Thomas, D., & Zachariah, S. (2018). Knowledge, Attitude and Practice of Pharmacovigilance in Developing Countries. *pharmacoepidemiology and pharmacovigilance*, 9(5), 177-193.

Visacri, M. B., de Souza, C. M., Sato, C. M., Granja, S., de Marialva, M., Mazzola, P. G., & Moriel, P. (2015). Adverse Drug Reactions and quality deviations monitored by spontaneous reports. *Saudi pharmaceutical journal : SPJ : the official publication of the Saudi Pharmaceutical Society*, 23(2), 130–137.