**(INJ.IRON SUCROSE) Induced Anaphylactic Shock – A detailed case report**

### M. Alagusundaram1,G. Sai Sri Harsha\*1, Venketeshwarlu Goli1, D.Chinna babu1, Mishra Namrata1, Bhattacharya Vijeta1, Chopra Neha1, Shailendra Singh Narwariya1, R. Jayasree2

\*1 School of Pharmacy, ITM university, Jhansi Road, Turari, Gwalior, Madhya Pradesh- 474001

1 School of Pharmacy, ITM university, Jhansi Road, Turari,Gwalior, Madhya Pradesh-474001

2 Krishna Teja Pharmacy College, Renigunta Road, Tirupati, Andhra Pradesh- 517503

Corresponding Author:

G. Sai Sri Harsha

Associate professor

Department of Pharmacy practice

School of Pharmacy, ITM University, Gwalior

Contact no: 7013974790

Email id: saiharshasri40@gmail.com

**INTRODUCTION**

 The major reason of disability worldwide is Anemia, and numerous patients like geriatric’s, pediatrics, including those with Kidney failure, IBD, and women who are pregnant, need to take iron supplements[1]. When used orally, iron supplements can cause stomach upset and be hard to tolerate. [2,3,4] Iron deficiency anaemia can be effectively treated with intravenous iron infusion, although some people worry about serious adverse effects including anaphylactic response. There are multiple intravenous iron formulations available in the market, but very few studies have compared their relative risk of adverse effects. [5]

Anaphylaxis is a potentially fatal, systemic allergy or hypersensitivity event that occurs suddenly[6]. Anaphylaxis is estimated to affect 0.05% to 2% of the population[7] Pregnancy-related anaphylaxis is extremely unusual, yet it can have devastating effects on both the pregnant woman and the unborn child [8,9]. Anaphylaxis during pregnancy is a rare occurrence. It is distinguished by a life-threatening generalized hypersensitivity reaction that often results hypotension in mother and/or morbidity in developing baby. IgE-mediated reactions to substances such as meals, medications, latex-based substances or insect poison frequently result in hypersensitivity. [10]

Anaphylaxis during pregnancy is managed by the same way as it is in normal women. The guidelines for treating acute anaphylactic episodes include stopping the triggers right away, maintaining airway and blood pressure, preventing low oxygen levels by providing complete oxygen support, Using fluids to revive with normal nacl solution, and giving medicines like epinephrin, anti-histamine, and corticosteroidss[11]. In the present scenario, A pregnant female with iron deficiency anaemia had reported an allergic response to iron sucrose.

**CASE REPORT:**

A 21-year-old female patient with G3P2L2 and 8MA anaemia. Since the patient was anaemic, (Hb:8g/dl) she was taken to a nearby medical facility for iron sucrose injections. Two hours after receiving the injection, the patient had develpoed symptoms like angioedema, headache, vomiting, and giddiness. She was moved to a district hospital after receiving basic supportive care.. She was brought to SVIMS for additional assessment and treatment because of a dip in her blood pressure. When the patient arrived to the ER, he complained of swelling on the face, lips and neck, difficulty in breathing (grade II-III NYHA), and heavy sweating. According to reports, the patient became hypersensitive on administration of Iron sucrose injection.

Upon general examination, it was discovered that her B.P was lower, at 90/50 mmHg, and her pulse rate was 110. According to lab results, Haemglobin, Red blood cells , Packed cell volume, Mean-cell-volume, MCH, lymphocytes, and serum potassium levels were all low. Her white blood cell (WBC), Erythrocyte Sedimentation rate(ESR), and neutrophil count were all elevated. On a regular basis, urine microscopy indicated the existence of pus cells, epithelial cells, and red blood cells. A Hypersensitive reaction(Anaphylactic Shock) due to Iron Sucrose (Inj.) was identified.

**U/S whole abdomen : ANTENATAL SCAN:**  uterine foetus -single, live

|  |  |
| --- | --- |
|  **PARAMETERS (DECREASED)** |  **OBSERVED VALUE**  |
|  HB RBC PCV MCV MCH LYMPHOCYTES SERUM.POTASSIUM | 9.2g/dl 4.04 million cells/cumm, 32.6% 81fl 23 pg2% 3.1 mmol/l. |

|  |  |
| --- | --- |
|  **PARAMETERS** **(INCREASED)** |  **RECORDED VALUE** |
|  WBC  ESR NEUTROPHILS |  17,300 cells/cumm 58 mm/1st hour 94% |

**Adverse Drug Reaction Management:**

On the first day, the patient complained of swelling on face, lips and neck , Dyspnea(SOB) GRADE II-III NYHA, and excessive perspiration. According to reports, the patient became hypersensitive to iron sucrose injections. Her heart rate and blood B.P were discovered to be 140 beats per minute and 80/40 mm hg, respectively, for which she was given the following medicine.

Injection- HYDROCORT -100mg-Intra venous route-STAT,

Injection- CPM-25mg-Intra venous route-STAT,

Injection- ONDANSETRON-4mg-Intra venous route-STAT,

Injection- PANTOPRAZOLE-40mg-Intravenous route-STAT.

On Day-2, the patient complained of Angioedema, headache, vomiting, shortness of breath, palpitations, and giddiness. Her blood pressure was 83/36 mmHg and her pulse rate was 118 beats per minute. She was given the drugs listed below.

Injection .EPINEPHRINE -2Ampoules+ 50CC NS @on flow 5 cc/hr,

Intra venous Fluids 1 bottle RL, DNS @ 100 ml/hr,

Injection-HYDROCORT-200mg-IV-QID, then titrated to 100 mg.

Injection-.CPM-2CC-IV-SOS,

Injection-.RANTIDINE-IV-BD,

Injection-DEXAMETHASONE-2CC-IV-SOS,

Injection-.AMOXY CLAV-1.2gm-IV-BD,

Injection-.ONDANSETRON-4mg-IV-SOS,

 Tablet- CETRIZINE -5mg-BD.

On Day-3, there were no new concerns. Her B.P, P.R, and R.R were 90/40 mmHg, 110 BPM and 40 CPM, respectively. She has given the following drugs

Injection-.HYDROCORT-100mg-Intravenous-4 times daily,

Injection-EPINEPHRINE-3Ampoules+ 50CC NS @on flow 5 cc/hr

Tablet-CETIRIZINE-10mg-twice daily,

Inj.ONDANSETRON-4mg-Intravenous-(when needed)

IVFLUIDS-2 bottles DNS, 1 bottle RL@75CC/hr,

Injection-AMOXY CLAV-1.25gm-IV-BD,

Injection-RANTIDINE-150mg-IV-BD,

Injection-CPM-2CC-IV-(when needed),

Injection-DEXAMETHASONE-2CC-IV-SOS for tachycardia, tachypnea, and hypotension.

She developed pallor on the fourth day. Her B.P and P.R were 110/50 mmHg and 125 bpm, respectively.

Injection-Adrenaline was withdrawn, and

 Injection-NOR ADRENALINE-2amp+50 ml NS@5ml/hr was started.

She had no new concerns on fifth day. Her H.R, B.P, and R.R were 102 BPM, 98/50 mmHg, and 30 cycles per minute, respectively.

* On day 6 there are no new complaints, same treatment was continued and Syrup.HAEMOPLUS-15ml-OD was added.

As a result of conservative treatment, the patient's symptoms improved. The patient had no anaphylactic symptoms and was discharged from the hospital in a hemodynamically good condition with the following care recommendations

 SYP.HAEMOPLUS-15ml-OD.

 **DISCUSSION**

Pregnant women are expected to experience anemia at a rate of 38.5 to 44.8% globally and 42.9 to 53.5% in South-East Asia. Iron deficiency is thought to be responsible for 50% of all anemia cases in pregnancy. According to reports, between 35 and 76% of pregnant women in countries with developing economies have iron-deficiency anaemia, while this incidence is on average just 18% in industrialised ones. [12],[13]. In individuals with iron deficiency anemia, parenteral iron therapy is advised when oral iron therapy is inadequate due to malabsorption .[14]. Iron therapy in IV route cures iron deficient anaemia significantly more quickly and safely than given in oral iron route[15] . Short-term adverse reactions of all known iron formulations for parenteral administration include metallic taste, back pain, nausea, vomiting, diarrhea, abdominal pain, hypotension, and allergic or anaphylactic reactions[16]. Anaphylaxis clinical presentations include shortness of breath, discomfort in the chest, Swelling(angioedema), urticaria with hypotension, and are frequently quick, severe, and occur along with the initial dosage of iron given in IV route.[17]

In the present case, an unwanted drug reaction occurred after few hours of administering the infusion of the initial dose of iron sucrose, indicating hypersensitivity rather than acute dose-related damage. According to the above data, the patient in our study became hypersensitive to iron sucrose injection.

**CONCLUSION**

According to the current study, allergic reactions to Intravenous iron are infrequent but potentially lethal. These can be avoided in part by implementing risk-mitigation techniques. Their management necessitates rapid recognition and severity rating, as well as careful observation and prompt treatment. All professionals involved in the administration of iron infusions must get continual training to make sure that when these unusual occurrences occur, they are addressed professionally and quickly. Following early treatment for anaphylaxis, mother and foetal outcomes were favourable in this case.

**REFERENCES:**

1.Murray CJ, Lopez AD. Global mortality, disability, and the contribution of risk factors: global burden of disease study. Lancet 1997; 349: 1436–42.

2.Cook JD, Skikne BS, Baynes RD. Iron deficiency: the global perspective. Adv Exp Med Biol 1994; 356: 219–28.

3.Makrides M, Crowther CA, Gibson RA, Gibson RS, Skeaff CM. Efficacy and tolerability of low‐dose iron supplements during pregnancy: a randomized controlled trial. Am J Clin Nutr 2003; 78: 145–53.

4.Maslovsky I. Intravenous iron in a primary‐care clinic. Am J Hematol 2005; 78: 261–4.

5.<https://doi.org/10.1111/j.1778-428X.2007.00042.x>

6.Simons FE, Schatz M. Anaphylaxis during pregnancy. J Allergy Clin Immunol 2012;130:597–606.

7.Lieberman P, Camargo CA, Jr, BohlkeK, et al. Epidemiology of anaphylaxis: findings of the American College of Allergy, Asthma and Immunology Epidemiology of Anaphylaxis Working Group. Ann Allergy Asthma Immunol 2006;97:596–602.

8.Simons FE, Schatz M. Anaphylaxis during pregnancy. J Allergy Clin Immunol 2012;130:597–606.

9.Chaudhuri K, Gonzales J, Jesurun CA, et al. Anaphylactic shock in pregnancy: a case study and review of the literature. Int J Obstet Anesth 2008;17:350–7.

10.Simons FE, Frew AJ, Ansotegui IJ, et al. Risk assessment in anaphylaxis: current and future approaches. J Allergy Clin Immunol 2007;120:S2–4.

11.Simons FE, Schatz M. Anaphylaxis during pregnancy. J Allergy Clin Immunol 2012;130:597–606.

12.World Health Organization. United Nations Children's Fund UNU. Iron-deficiency anemia; Assessment, Prevention and Control; A guide for programme managers. Geneva: World Health Organization; 2001.

13.World Health Organization. Worldwide prevalence of anaemia 1993-2005: WHO Global database on anaemia. Geneva: WHO Press; 2008.

14.Bashiri A, Burstein E, Sheiner E, Mazor M. Anaemia during pregnancy and treatment with intravenous iron: Review of the literature. Eur J Obstet Gynecol Reprod Biol 2003;110:2-7.

 15.Bayoumeu F, Subiran-Buisset C, Baka NE, Legagneur H, Monnier-Barbarino P, Laxenaire MC. Iron therapy in iron deficiency anemia in pregnancy: intravenous route versus oral route. Am J Obstet Gynecol 2002;186:518-22.

16.Chandler G, Harchowal J, Macdougall IC. Intravenous iron sucrose: establishing a safe dose. Am J Kidney Dis 2001;38:988-91.

17.National Kidney Foundation. KDOQI Clinical Practice Guidelines and Clinical Practice Recommendations for Anemia in Chronic Kidney Disease. Am J Kidney Dis 2006;47(Suppl. 3):S1-146.