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IV BOLUS RANITIDINE INDUCED ANAPHYLAXIS REACTION WITH TRIGGERED THROMBOCYTOPENIA: A CASE STUDY

Kingsley Joshua I.*[1], Aswathee Sivakumar[1], Moushmi Arulmoorthy[2], Sengottuvelu Singaravel[2] and Sivakumar Thangavel[2]

[1]Pharm D Intern, Department of Pharmacy Practice, Nandha College of Pharmacy, Erode.

[2]Professor, Department of Pharmacy Practice, Nandha College of Pharmacy, Erode.

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***Corresponding Author**
Kingsley Joshua I.
Pharm D Intern, Department of Pharmacy Practice, Nandha College of Pharmacy, Erode.

ABSTRACT

Introduction: Ranitidine is an H2 receptor antagonist used to heal stomach ulcers; however, its administration rarely leads to anaphylaxis eruption. Most of the drugs can cause serious allergic reactions that will rapidly develop skin rash symptoms initially which then affects the respiratory and circulatory obstructions which is known to be anaphylactic shock. **Case Report**: A 65 year old female patient was diagnosed with acute febrile illness and thrombocytopenia and had complaints of fever, vomiting and headache. Intravenous fluids were given to the patient and when administering the drug Ranitidine through bolus injection, the patient felt itching, and dyspnea, had a decreased pulse rate, and within minutes patient was unconscious which is considered to be anaphylactic. Immediately patient was shifted to the Intensive Care Unit and treatment was given but the patient did not show any improvement. **Discussion**: Ranitidine-induced Anaphylaxis was diagnosed based on the early reaction and the skin test with positive results. IgE-mediated is the assumed natural reaction. The relation of the issue with the patient's pre-existing thrombocytopenia is one of the causes of the worsening of the reaction. Specific examples in medical literature favor the suggestion that there is a certain degree of cross-reactivity between H2 receptor antagonists and different allergic reactions. **Conclusion**: This case report exhibits the rarity and seriousness of the emergence of Ranitidine-induced Anaphylaxis thus obliging the necessity of devising proper diagnostic tools, care, and constant monitoring of patients alongside the promotion of new drugs to bring down the level of such risks.

KEYWORDS: Anaphylactic Reaction, Ranitidine, Adverse reaction.

INTRODUCTION

Anaphylaxis takes place in 1 in 10,000 to one in 20,000 cases inside the perioperative context, making it unusual. If now not identified and dealt with properly away, it's miles lethal in 0.65% to 2% of cases.[1] Anaphylactic shock is an intense, unexpected, doubtlessly fatal considerable allergic reaction response marked with the aid of abrupt respiratory, circulation, or airway difficulties, alongside pores and skin rash or mucous membrane abnormalities.[2] Ranitidine is an H2 receptor antagonist broadly used for acid peptic disease and normally well tolerated. Anaphylactic reaction to ranitidine is uncommon and just a few cases were said in the literature.[3] Ranitidine hydrochloride works by using competitively inhibiting histamine at the H2-receptors of the gastric parietal cells. This reduces the quantity of hydrogen ions within the stomach, the extent of the stomach, and the discharge of gastric acid.[4] In comparison Ranitidine is suggested as an inverse agonist that causes the up regulation of H2 histamine receptors and increased histamine ranges because of enzyme induction as a mechanism for the response. This effect, which comes after prolonged and/or big doses of antihistamines, might affect other people who suffer from disorders associated with mast cellular activation, like mastocytosis or mast cellular activation syndrome.[5] Two techniques of administering ranitidine are Intramuscular (I.M.) and Intravenously (I.V.). IV has to be diluted, but I.M. Injection is not. 50 mg is diluted to 20 ml with Normal Saline (NS) or Dextrose 5% in water (D5W) for Intravenous push (IVP), and the dosage is administered over at least 5 minutes. IVPB, or Intravenous piggyback, is given over 15 to twenty minutes. Over the direction of 24 hours, the 6.25 mg/hour non-stop IV infusion fee is changed depending on the stomach pH Usual dosages for ulcer prophylaxis are 150 mg at bedtime, 300 mg two times every day, or up to 600 mg/day for problems along with stomach hypersecretory issues. The advocated dosage for I.M/IV is 50 mg every 6–8 hours, with each day most of 400 mg.[3]

CASE REPORT

A 65-year-old female patient was admitted to the general ward with complaints of fever (101 F) persisted for 4 days, accompanied by headache and vomiting. Laboratory investigation found out decreased platelet count of 79 x 109/L (100 - 300 x 109/L) with regular white blood cells and red cell values, subsequently affected person was identified with acute febrile illness and thrombocytopenia. The patient was initiated with Intravenous fluids including

Normal Saline and Ringer Lactate at 125 ml/hr, Injection Cefotaxime 1g twice daily, Intravenous bolus Ranitidine 50 mg twice daily, Tablet Doxycycline 100mg twice daily, Tablet Paracetamol 500mg thrice daily and Tablet Domperidone 10mg thrice daily. While administering Ranitidine through Intravenous bolus to the patient, within seconds the patient experienced dyspnoea, itching all around the body with reducing pulse rate. After 5 minutes, the patient underwent unconsciousness and did not react to the painful stimuli. This clinical presentation indicated anaphylactic shock secondary to Ranitidine administration and as a result immediate Cardio Pulmonary Resuscitation (CPR) along with Injection of Adrenaline 1mg and Injection Hydrocortisone 200mg was initiated via Intravenous bolus stat. The patient was intubated with a 7.0mm endotracheal tube and connected to a bag–valve–mask for ventilation. The patient was transferred to the Intensive Care Unit (ICU) with ventilation support, Intravenous Infusion of Noradrenaline 20mg was initiated at a rate of 15ml per hour and Intravenous Dopamine 20mg in 50ml Normal Saline at the rate of 5ml per hour to treat excessive hypotension and bradycardia. The patient had severe anaphylactic response because of Ranitidine and had no response to the treatment.

DISCUSSION

In the presented case of Ranitidine-induced anaphylaxis, the patient was diagnosed based on the anaphylactic episode with shortness of breath and hypotension following a positive skin reaction to the drug Ranitidine within minutes when given intravenously. A challenge test was not performed as the patient clearly showed immediate reactivity to the drug ranitidine. We assume that this drug-induced anaphylaxis may be due to an IgE-mediated pathway. However, the specific IgE cannot be detected. A similar study was done by YI Kim et *al.*, where cross-reactivity between the H2 receptor antagonists was discussed.[6] and in the study conducted by Rethnam U et *al*., where the patient experienced itching which spread from the injection site to the upper limb along with difficulty in breathing after administration of the respective drug.[7] Anaphylaxis is a clinical syndrome that affects multiple organ systems and is characterized by the rapid onset of life-threatening respiratory and cardiovascular symptoms as the first recognized signs in most severe cases. Anaphylaxis is generally an unanticipated severe allergic reaction involving mast cells and basophils which mostly occurs on reexposure to a specific antigen and requires the release of proinflammatory mediators, but it can also occur on first exposure.[8] The drug is found to be prone to worsen the effect of thrombocytopenia as the patient was already diagnosed with it which correlates to the study done by Bangia AV *et al*., and the patient's anaphylactic reaction has to be managed through

blood transfusion for thrombocytopenia.[9] From the study done by Patterson LJ *et al*., pretreatment with H2 receptor antagonists like ranitidine may increase susceptibility to heart block during anaphylaxis, possibly by enhancing histamine's cardiac effects which is a contrast to this study where the patient has not experienced any heart block, however, the patient had bradycardia and no systemic examination could be evaluated. This highlights the importance of medication management in high-risk patients facing severe allergic reactions.[10] Ranitidine has been observed with severe side effects which to be aware of symptoms like anaphylaxis, maculopapular lesions seen on the abdomen and chest spread to the limbs, edema of the face and lips with diffused itching, and laryngeal spasm when compared to Cimetidine which is another H2 receptor blocker.[11-13] Accordance to the study by Oliva A *et al*., the drug showed a fatal response within 30 minutes of administration which parallels our study where the patient had a decreased response to the treatment.[14]

As per the study, ranitidine has to be given cautiously through intravenous and oral routes and the drug should be intervened properly by monitoring the Adverse Drug Reactions (ADR) accurately. Proper diagnostic tools, prior patient care, therapeutic advancements, and research in this field can reduce the incidence of such conditions. This led to an illustration that even OTC medicines can lead to fatal and anaphylactic responses.

CONCLUSION

This case report brightens the rare and unusual adverse reaction of ranitidine-induced anaphylactic reaction with worsened thrombocytopenia in clinical practice. However, this report suggests that cautiousness needs to be exercised in the administration of the drug. Additionally, a specific strategy has to be implemented for the prevention of ADR in hospitalized patients, like proper diagnostic tools, prior patient care, regular monitoring, therapeutic advancements and research in this field can reduce the incidence of such conditions.

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