

## Case Report

---

# HYPERSENSITIVITY REACTION AFTER INFUSION OF HARTMAN SOLUTION: IMMEDIATE DETECTION AND MANAGEMENT

Hasina Begum<sup>1</sup>, Yameen Hossain<sup>1</sup>, UH Shahera Khatun<sup>2</sup>

### SUMMARY:

Although uncommon, hypersensitivity (allergy) and idiosyncratic reactions are potentially disastrous without early recognition and effective management. A 16 years old male patient suffering from stricture urethra (post traumatic) scheduled for urethroplasty under SAB (Subarachnoid block). But during preloading with intravenous fluid patient suddenly developed dyspnea, wheezing and rash which was managed immediately with steroid, antihistamine and bronchodilator and diagnosed as febrile reaction and surgery postponed. After 6 months he was again scheduled for surgery and at that time no adverse reaction was revealed after IV infusion for 15 minutes but suddenly developed severe respiratory distress and cardiac arrest and diagnosed as anaphylactic reaction which was managed with inj. adrenaline, cardiac massage, intubation & ventilation with 100% O<sub>2</sub>. And patient became completely stable within minute.

### INTRODUCTION:

The risk of an adverse reaction increases in a non-linear fashion with the number of drugs given to a patient. Therefore, as polypharmacy is usual during anaesthesia, there is a substantial risk of drug reaction. The incidence of perioperative drug hypersensitivity in anaesthetic practice is about 1 in 11,000.<sup>1</sup> Most reactions during general anaesthesia follow intravenous drug administration.

Hypersensitivity reaction may be either anaphylactic or anaphylactoid. These reactions differ from direct drug induced histamine release which does not have an immunological basis.<sup>2</sup>

When an immune response results in exaggerated or inappropriate reactions harmful to the host, the term hypersensitivity or allergy is used.<sup>3</sup> The

immune responses that may result from exogenous antigens take a variety of forms, ranging from annoying but trivial discomforts such as itching of skin to potentially fatal disease.<sup>4</sup>

Immediate hypersensitivity or anaphylaxis is an antibody-mediated reaction to an antigen characterized by a sudden, life threatening, generalized patho-physiological response involving the cutaneous, respiratory and cardiovascular systems. Primary antigen exposure stimulates the production of specific IgE antibodies which binds to mast cells. Re-exposure with antigen bridging of these IgE antibodies stimulates mast cell degranulation and systemic release of the mediators of anaphylaxis. Mediators are primary like histamine, adenosine, eosinophil chemotactic factors, proteases, heparins and secondary like leukotrienes, prostaglandins, platelet activating factors, cytokines etc.<sup>5</sup>

Most important agents responsible for systemic anaphylaxis in anaesthetic practice includes I.V induction agents, muscle relaxants, opioids, ester local anaesthetic agents, colloid solutions, antibiotics like penicillin, blood products, hormones, enzymes, polysaccharides etc.<sup>6</sup>

As the cause is unpredictable and as mortality increases with the delay in treatment, so early recognition and effective measures are essential.

### CASE REPORT:

A 16 years old male patient of 48 kg with ASA physical status 1 was admitted to Dhaka Medical College Hospital with stricture urethra and had a plan to do urethroplasty under sub-arachnoid block (SAB). All physiological parameters, chest X-ray and laboratory findings were normal.

6 years back, he experienced RTA and developed ruptured urethra and subsequently stricture urethra and was operated under SAB without any

---

1. Junior consultant, Dept. of Anaesthesiology, DMCH

2. Junior consultant, Dept. of Anaesthesiology, DMCH

3. Prof. and Head, Dept. of Anaesthesiology, DMCH

anaesthetic complication[for 4 times]. But due to operative complication, he was scheduled for reconstruction operation[5<sup>th</sup> time] under SAB. During preloading with Hartman solution (iv fluid) for SAB patient suddenly developed dyspnea, wheeze and skin rash on OT table and treated with inj. hydrocortisone, inj. oradexen and inj. phanargan assuming a case of febrile reaction?, patient then become alright and surgery postponed. After 3 months patient again sent to OT for reconstruction under SAB. As patient previously developed saline reaction, preloading done slowly with Hartman solution and closely observed for 15 mins. and then prepared for intrathecal block. Suddenly patient developed severe respiratory distress and cardiac arrest. He was then immediately diagnosed as anaphylactic reaction and managed with CPR i.e inj. adenaline, intubation and ventilation with 100% O<sub>2</sub>. Patient became completely stable after few minutes. Now the patient is completely alright and waiting for operation.

#### DISCUSSION:

Richet & portier<sup>8</sup> were attempting to immunize dogs against toxins of the sea – anemone and noted that animal that had survived a sub lethal injection to toxins were unduly sensitive to a second injection – so sensitive indeed that quite small doses produced a severe reaction, often resulting in death. At first the phenomenon was explained on the basis of the toxic nature of the extract, but further works showed that other antigenic proteins could produce the same effects even though they were not in themselves toxic. Richet called the reaction anaphylaxis because it seemed to represent the antithesis of immunity (Gr. ana – against & phylaxis – protection). It was later demonstrated that anaphylaxis was mediated by ‘reagenic antibody’ and finally that reagin was IgE<sup>9</sup>.

The typical reaction is sometimes caused by the injection of drugs or foreign proteins or by the bite of an insect. Systemic anaphylaxis may occur by polysaccharides<sup>10</sup>.

In typical anaphylaxis antigen exposure has occurred previously, leading to significant quantities of IgE being fixed to basophiles and mast cells. On a subsequent encounter with antigen a severe reaction ensues due to sudden release of mediators especially histamine.

In this case, the patient was operated several times (4 times) before these two episodes, when infusion of Hartman solution given all the times during

operation without any reaction. But after that patient developed typical allergic reaction like itching, mild respiratory distress (wheeze) and skin rash. Unfortunately he was diagnosed as a case of febrile reaction and managed with steroids and antihistamines as hypersensitivity to polysaccharides are very rare.

Keeping in mind of saline reaction infusion of Hartman solution was introduced very slowly and observed for 15-20 minutes but there was no reaction. After that during preparation for SAB, patient suddenly developed severe respiratory distress and cardiac arrest. Advanced life support started immediately and patient became stable.

In case of systemic anaphylaxis Ratchet & Portier shown that very small dose of offending antigen produced severe reaction in subsequent injection. But unusually the reaction occurred after 15-20 minutes in this case, though the clinical features were typical of systemic anaphylaxis and managed accordingly. And the boy became completely stable after few hours. So prompt diagnosis and management can save some valuable life in anaesthetic practice.

#### REFERENCES:

1. A.R.Aitkenhead & G. Smith; Textbook of Anaesthesia; 3<sup>rd</sup> ed; page 397.
2. A.R.Aitkenhead & G. Smith; Textbook of Anaesthesia; 3<sup>rd</sup> ed; page 397.
3. Warren Levinson, Ernest Jewetz; Medical Microbiology & Immunology; 5<sup>th</sup> ed; page 367.
4. Cotran, Kumar, Collins; Robbins Pathologic Basis of Disease; 6<sup>th</sup> ed; page 196.
5. Cotran, Kumar, Collins; Robbins Pathologic Basis of Disease; 6<sup>th</sup> ed; page 197.
6. Cotran, Kumar, Collins; Robbins Pathologic Basis of Disease; 6<sup>th</sup> ed; page 199.
7. M.D. Vickers, M. Morgan, P.S.J. Spencer, M.S. Read; Drugs in Anaesthetic and Intensive Care Practice; 8<sup>th</sup> ed; page 49.
8. Portier PJ, Richet CR, 1902 Del action anaphylactique de certain venino, CR soc Biol(Paris) 54; 170-172.
9. Ishizaka K, Ishizaka T; 1967; Identification of gamma E antibodies as a carrier of reagenic activity, Journal of immunology 99: 1187-1198.
10. Cotran, Kumar, Collins; Robbins Pathologic Basis of Disease; 6<sup>th</sup> ed; page 199.