Case Report

Anaphylaxis from atracurium without skin manifestation

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Abstract

Anaphylaxis is an acute, potentially fatal allergic reaction involving multi organ system that is triggered by a wide range of antigens with a subsequent release of chemical mediators from mast cells and basophils. Diagnosis is primarily clinical though laboratory studies are helpful in further confirmation. Anaphylactic reactions during anesthesia are rare, but can be fatal if not promptly recognized and treated. Among all drugs commonly used in anesthesia, muscle relaxants are the most notorious to trigger anaphylactic reactions and benzylisoquinolinium group of drugs are known to be less common an offender than the steroidal compounds. We report severe anaphylactic reaction after administration of atracurium that was promptly diagnosed and managed without any further morbidity.

Key words: Anaphylaxis, atracurium, intra-operative

Introduction

Any drug administered in the perioperative period can cause anaphylaxis, which may be life-threatening. The estimated incidence of anaphylaxis ranges from 1:10,000 to 1:20,000.[1] Neuromuscular blocking agents (NMBAs) (69.1%), especially atracurium and latex (12.1%) were the most frequently involved drugs according to the most recent French epidemiological survey.[2] Rarely death may occur, despite proper treatment.[3]

Case Report

A 23-year-old female patient suffering from the chronic pancreatitis was posted for pancreatico-jejunostomy under general anesthesia. She did not have history of any other medical illness, no history of allergy; no history of previous surgery under anesthesia; her clinical examination and laboratory investigations were essentially normal .In the operating room, we secured an 18 G IV cannula, attached standard ASA (American Society of Anesthesiologists) monitors and recorded a baseline heart rate (HR) 85/min, blood pressure (BP) 115/74 mm Hg and a SpO_2 of 97% on room air.

Initially, she received 100 mcg fentanyl intravenously (I.V). After preoxygenation of 3 min, anesthesia was induced with 100 mg propofol and muscle relaxation for endotracheal (ET) intubation was facilitated by 75 mg succinylcholine. After confirmation of proper placement of ET tube by auscultation and $EtCO_2$, ET tube was fixed at 18 cm. Anesthesia was maintained with 66% N_2O, 33% O_2 and 1% isoflurane. Three minutes after intubation, when respiratory efforts were seen, 15 mg atracurium was given I.V. Within 20-30 s after atracurium administration, we noticed a tachycardia of 140-160/min; BP was unrecordable and a peak airway pressure of 50 cm H_2O with a SpO_2 of 92%; however, we did not find any skin manifestations. On auscultation an essentially silent chest was found . We made a presumptive diagnosis of anaphylactic reaction; lungs were ventilated with 100% oxygen, intravenous 50 mcg adrenalin was administered in a dilution of 1:10000 and a rapid infusion of Ringer's lactate was initiated. After 1 min BP was 65/35 mm Hg, SpO_2 - 94% and airway pressure was 40 cm H_2O. Electrocardiography displayed sinus rhythm with a HR of 140/min. After another 2 min we repeated same IV dose of adrenaline and continued rapid infusion of Ringer's lactate. After 2 min of second dose of adrenalin, we recorded a BP

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of 85/55 mm Hg, SpO_2 96%, peak airway pressure of 30 cm H_2O, sinus tachycardia with a HR of 135/min. Wheezing was ausculated all over the lung fields. We then administered 10 mg chlorpheniramine and 200 mg hydrocortisone by slow IV injection. We decided to postpone the surgery for that day. After attainment of hemodynamic stability and resumption of spontaneous breathing activity, we reversed residual neuromuscular blockade by 2.5 mg neostigmine and 0.5 mg of glycopyrrolate. Trachea was extubated after 1 h of the incident and patient was kept on oxygen via face mask and monitored for the next 24 h in the post-anesthesia care unit (PACU). A post-operative chest X-ray done in the PACU was essentially normal. After 2 h of the event we collected blood sample for serum tryptase assay and after 4 weeks we arranged an intradermal test for atracurium. Serum tryptase value was 51.7 mcg/l and intradermal test for atracurium was found to be positive according to Société française d'anesthésie et réanimation criteria.[4] However, it was negative for vecuronium and rocuronium. She underwent surgery uneventfully using the vecuronium as muscle relaxant 6 weeks later.

Discussion

NMBAs are responsible for around 50-70% of allergic reactions under anesthesia.[5] These immediate hypersensitivity reactions may either be immunologic (immunoglobulin E mediated anaphylaxis) or related to direct stimulation of histamine release (anaphylactoid reactions).[6] Anaphylactic reactions may not be clinically distinguished from anaphylactoid reactions. Therefore, any suspected anaphylactic reaction must be thoroughly investigated to confirm the nature of the reaction, the nature of suspected drugs and to provide precise recommendations for future anesthetic procedures. Cross reactivity among different muscle relaxants is common and hence other muscle relaxants should also be tested. It is documented that the negativity of intradermal tests to other NMBAs allows for a subsequent safe use of these negative drugs.[7] However, false negative results are also reported.[8] Our current knowledge and evidence do not support routine intradermal testing for the sensitivity to NMBA in all patients; but allergy assessment may be recommended in high-risk patients.[9] Prior exposure to the offending drug is not necessary for development of anaphylaxis.[10]

Hypotension, tachycardia, increased airway pressure and desaturation can also be due to other clinical conditions. Tension pneumothorax is one of them. However, temporal association between the event and atracurium injection and dramatic response with injection adrenaline guided that anaphylaxis was more likely. We also considered the possibility of acute cardiogenic pulmonary edema, which was less likely due to absence of any preoperative cardiac abnormality and basal crepitations in lung fields.

One interesting fact about our case is that the patient did not develop any skin reaction or angioedema. The presenting features were limited to cardiovascular and respiratory system. Active management of anaphylaxis is very important and we followed the recommendations of Resuscitation Council UK guidelines.[11]

We should keep in mind that anaphylaxis may occur even without skin manifestation and mere absence of skin manifestation does not exclude the diagnosis of anaphylaxis. Timely diagnosis and management of anaphylaxis is the key to prevent morbidity and mortality diagnosis of anaphylaxis.

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