Methylprednisolone Induced Anaphylactic Reaction in a Case of Renal Transplant Anaesthesia

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ABSTRACT

Methylprednisolone Sodium Succinate (Solu-Medrol) is widely used in the management of renal transplantation. Of interest, is the rare occurrence of anaphylaxis and anaphylactoid reaction to Solu-Medrol and clinicians should be aware of this potential risk. The transplant patients may benefit with skin testing against Solu-medrol prior to transplant and in positive cases by using alternate medication with other steroids, lower administration rates and dosages. We present a case of intra operative angioedema, a rare presentation of anaphylaxis induced by Solu-Medrol in renal transplant patient.

KEYWORDS: Solu- Medrol, Angioedema, Type IV Hypersensitivity Reaction, Renal Transplant.

INTRODUCTION

Allergic reactions are common and immune response that causes an allergic reaction is similar to the response that causes hay fever mostly happening soon after the contact with an allergen. Many allergic reactions are mild, while others can be severe and life threatening. They can be confined to a small area of the body, or they may affect the entire body. The most severe form is called anaphylaxis or anaphylactic shock. Allergic reactions occur more often in people who have a family history of allergies.¹ Acute management of the patient includes conventional emergency supportive measures. These include boluses of intravenous fluid and epinephrine to counteract refractory hypotension, beta-2 agonists to reverse bronchospasm, and corticosteroids with or without histamine-1 receptor antagonists to mitigate cytokine release ². While an immediate definitive diagnosis is not possible, the clinician must be cognizant of the acute presentation and treatment of anaphylaxis in the perioperative setting. Once the patient is stabilized, definitive diagnosis and management requires a coordinated effort by anesthesiologists, allergists, and the surgery team. Corticosteroid therapy is a cornerstone of the management of renal transplantation. Above all, methylprednisolone is currently used both as a prophylactic and for the treatment of acute rejection episodes. ³ A rare occurrence of anaphylaxis and anaphylactoid reaction is associated with the use of intravenous methylprednisolone sodium succinate and other injectable steroids. More than 13 cases has been reported in literature in this regard. ⁴ We present a rare case of angioedema in renal transplant patient after Solu-Medrol administration which was detected intra operatively and managed successfully.

CASE REPORT

A 39 years female for renal transplant was anaesthetized with 10 mg Nalbuphine, 120 mg Propofol and 35 mg Atracurium. Anaesthesia was maintained with mixture of Isoflurane in 100% oxygen after intubating with 7 mm cuffed endotracheal tube. Central venous pressure line of 18 g was passed in right internal jugular vein and arterial line of 20 g was inserted in right radial artery. Baseline readings of blood pressure (145/85 mm Hg), SpO2 (98%), ECG and pulse (85 per min) were recorded. The blood samples for serum potassium and arterial blood gases were sent for laboratory investigations at the time of induction. A normal saline infusion was started in right forearm IV line of
18 g with aim to infuse about 60 ml/kg overall fluid while keeping target CVP and blood pressure. The blood pressure of 130/80 mm Hg was aimed with MAP of 70 mm Hg throughout the procedure. After sterile drape, surgery was started for renal graft. CVP of about 15 was maintained throughout the procedure. The Simulect injection 20 mg, prepared in 100 ml burette was started slowly and finished in 40 min. Injection mannitol 200 ml of 20% solution was started and completed about 20 min before cross clamping of renal vessels. Then injection methylprednisolone 500 mg prepared in burette of 100 ml was started slowly and completed before renal vessels grafting. Lasix was given in a dose of 100 mg after opening the vascular clamp. The urine formation just after opening the renal vascular clamp confirmed the successful renal transplant. The serum potassium and arterial blood gases were monitored as per hospital protocol. After reversal with atropine and neostigmine, the patient was prepared for extubation. On Laryngoscopy swelling of lips, tongue and oral cavity was noticed. No hemodynamic collapse, skin rash or sweating was noticed. Chest auscultation was normal and suspicion of anaphylaxis was raised considering her abnormal periorbital and oropharyngeal swelling and excluding other causes. The extubation was delayed and adrenaline 50 µg was given after discussing the scenario with surgical team and nephrologist. Normal saline infusion rate was increased. The facial as well as oropharyngeal swelling gradually decreased near normal after about 1 hour and second dose of adrenaline bolus 50 µg was repeated. She was successfully extubated and shifted to intensive care unit. Her heart rate decreased to 115 / min (145/min) with arterial blood pressure of 159/78 mm Hg (110/60 before adrenaline) with SpO₂ 95 to 98 % (100 % O₂ via endotracheal tube) after the treatment.

**DISCUSSION**

Perioperative anaphylaxis is a rare and potentially lethal event that requires quick recognition by the clinician. The incidence of perioperative anaphylaxis is estimated to be 1 in 10,000–20,000 anesthetic procedures. According to the National Institute of Allergy and Anaphylaxis Network symposium, anaphylaxis is defined as “a serious allergic reaction that is rapid in onset and may cause death.” True incidence of anaphylaxis is likely under reported because the majority of reactions go unrecognized due to mild and transient nature. The typical signs of a severe allergic reaction include erythema, edema, pruritus, hypotension, tachycardia, and bronchial and gastrointestinal smooth muscle constriction. The majority of these signs and symptoms are masked by anesthesia making everything much trickier. The patient is often fully covered with a sterile drape, so cutaneous signs may not be seen initially. Blood pressure is often lower than normal during anesthesia due to various anesthetic agents. The anesthesia provider may just treat it as decreased vascular tone and give a small dose of a vasopressor. Moreover, fluctuations in blood pressure are expected in patients with hypertension because of an altered auto regulatory curve in renal transplant patients due to chronic kidney disease and obviously an intubated patient won’t be able to tell you that they are itching. Clinicians should be suspicious of refractory hypotension with minimal response to vasopressors and increasing peak inspiratory pressures.

The initial diagnosis has to be presumptive and based upon sharp clinical judgment which in our case was periorbital, lips and oropharyngeal swelling (angioedema). It is a rare presentation and least reported in literature in renal transplantation. While a definitive diagnosis is dependent on skin testing which should be done prior to transplant which was not done in our case because it is not a routine in our hospital to perform skin testing in very case. The skin testing is performed in cases where there is positive history and high suspicion. Secondly diagnosis of allergic reaction is usually a diagnosis of exclusion and angioedema is very rare presentation of anaphylaxis. This is important because life-threatening anaphylaxis can progress within minutes of initial presentation. To review, there are 4 different types of hypersensitivity reactions and they present differently. Type I is an Ig E-mediated response that leads to histamine release from mast cells causing vasodilation, bronchospasm, and cardiovascular collapse in severe cases. This type of reaction is common with drugs and is the most likely one to be encountered in the operating room. Type II is an Ig G-mediated reaction that occurs when preformed antibodies bind to an antigen and activate the complement cascade. A type III hypersensitivity reaction is when an antibody–antigen complex forms and causes an immune response. Type IV hypersensitivity reactions involve T cell-mediated cytokine release in response to a previously encountered antigen. Histamine usually has a half-life of 15-20 min. However, in severe anaphylactic reactions histamine levels can remain elevated for up to 2 h, likely because of saturation of enzymatic metabolism. Serum tryptase levels can also be measured within 2 h of a suspected reaction with elevated levels supporting mast cell activation and anaphylaxis. Studies have shown that neuromuscular blocking agents are the most common offending drugs, with an incidence of 50–70 %

**CONCLUSION**

Anaphylactic reaction to Methylprednisolone Sodium Succinate (Solu-Medrol) is rare occurrence and clinicians should be aware of this potential risk.
CONTRIBUTION OF AUTHORS

Ahmad M: Manuscript writing, Design methodology, Data collection
Khurshid T: Manuscript writing
Ali L: Manuscript final reading and approval
Shafi M: Literature review

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REFERENCE