

Anaphylactoid Shock with Infusion of 5% Albumin in a Patient under General Anesthesia

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ABSTRACT

A 61 year old male patient undergoing gastrectomy under general anesthesia developed severe anaphylactoid shock after 15 minutes from starting 5% albumin infusion. His blood pressure went from 101/67 down to 44/23 with his heart rate going up from 91 to 99. A total of 1600 mcg of phenylephrine were given without any improvement in the hemodynamics. We then gave 50 mcg of Epinephrine to which blood pressure rapidly responded going up to 141/60 (mean 88). Then 15 mg of Dexamethasone were given. Blood pressure remained stable with the mean between 75 and 90, without requiring anymore pressors. 5% albumin is considered among the safer colloids with a risk of anaphylactoid reactions less than gelatins and dextrans and comparable to starches. However, severe life threatening anaphylaxis has been reported with Albumin infusion. With the still ongoing crystalloid colloid debate, with many studies showing no survival benefit with colloid use for volume resuscitation, the risk of severe anaphylactic shock, even with the safer colloids like albumin should drive to a more conservative use of albumin for volume resuscitation, specially under general anesthesia, when recognizing the signs and symptoms of anaphylaxis and the offending agent maybe more challenging.

Keywords: Albumin; Colloids; Anaphylaxis; Anesthesia

1. Introduction

We are describing a case of anaphylactoid shock with infusion of 5% human albumin in a patient with gastric cancer undergoing gastrectomy. 5% Albumin, a widely used colloids, is considered among the safer colloids with a risk of anaphylactoid reactions less than gelatins and dextrans and comparable to starches [1]. However, severe life threatening anaphylaxis has been reported with Albumin infusion [2-4]. With the still ongoing crystalloid colloid debate, with many studies showing no survival benefit with colloid use for volume resuscitation [5,6], the risk of severe anaphylactic shock should drive to a more conservative use of colloids for volume resuscitation, including the safer ones, specially under general anesthesia.

2. Case Report

A 61 year old male patient who presented with hematemesis was diagnosed with gastric cancer by EGD and biopsy. Initially a neoadjuvant therapy followed by surgical resection was elected. However, he developed neutropenic fever after the first round of chemotherapy and decision was made to proceed with surgical gastrectomy.

The patient had a past medical history significant only for a basal cell carcinoma that was resected, was not on any medication, had no known allergies and had an essentially normal physical exam.

On the day of surgery, he had no complaints preoperatively, with stable vital signs and a normal physical exam. He was pre-medicated with Midazolam 2 mg. Anesthesia was induced with Propofol 150 mg and Fentanyl 250 mcg. He was easily intubated following succinylcholine 100 mg. An arterial line was placed for blood pressure monitoring. Hydromorphone 2 mg was given for pain control and Rocuronium 50 mg for muscle relaxation. Anesthesia was maintained with Sevoflurane and was initially uneventful.

During the first hour of anesthesia blood pressure remained stable with the mean maintained between 65 - 80, heart rate was between 80 - 90. Fluids were replaced with normal saline (0.9% NaCl), 1600 ml were infused during the first hour. After that, and as the surgeon was in the process of dissecting around the stomach, we started infusing 5% Albumin to keep the intravascular volume expanded as it has a longer intravascular half life. Two 250 ml bottles of 5% Albumin were infused over 15 minutes. Blood pressure remained stable during the infu-

sion of the first bottle. However, while the last few milliliters of the second bottle were running, blood pressure suddenly dropped to 44/23 (mean 32) and heart rate went up to 99. We stopped the albumin infusion and gave a total of 1600 mcg of phenylephrine without any improvement in the hemodynamics. We then gave 50 mcg of Epinephrine to which blood pressure rapidly responded going up to 141/60 (mean 88). Then Dexamethasone 15 mg was given. Blood pressure remained stable with the mean between 75 and 90, without requiring anymore pressors. The surgery was completed successfully without any further events.

Post operatively the patient was hemodynamically stable with normal neurologic and cardiac functions.

3. Discussion

Anaphylaxis is an immediate systemic reaction caused by rapid IgE-mediated immune release of potent mediators from tissue mast cells and basophils [7]. The term Anaphylactoid reaction is used when the immune mechanism has not been confirmed by allergologic tests. Clinical signs and symptoms can be variable including skin hives or flushing, airway compromise, fall in blood pressure or cardiopulmonary collapse (shock) [8]. The prevalence of anaphylaxis during anesthesia is reported to vary between 1 in 3500 and 1 in 13,000 procedures in French series [9,10] and between 1 in 10,000 and 1 in 20,000 in an Australian study [11]. Neuromuscular blockers are reported as the most frequent offenders contributing to 58% of anaphylactic reactions under anesthesia [12]. However colloids have been recognized to cause up to 4% of all perioperative anaphylactic reactions [10,12,13]. These reactions were severe in 20% of the cases and generally occurred 20 min after start of infusion. Moreover, fatalities to colloids have been reported [14]. Albumin is considered a relatively safer colloid with lower incidence of anaphylaxis compared to other colloids. In a French multicenter prospective study of anaphylactoid reactions to colloid plasma substitutes. The frequency of anaphylactoid reactions were 0.345% for gelatins, 0.273% for dextrans, 0.099% for human albumin, and 0.058% for starches [1].

In this case, our patient developed a severe anaphylactoid shock after 15 minutes from starting albumin infusion. His blood pressure went from 101/67 down to 44/23 with his heart rate going up from 91 to 99. Blood pressure did not respond to a total of 1600 mcg of phenylephrine while a good response occurred with 50 mcg of epinephrine which is considered the first choice medication to treat anaphylactic shock. A few case reports on severe anaphylaxis to albumin infusion have been reported [2-4]. One case report from Japan reported severe anaphylaxis after albumin infusion in a patient

with ahaptoglobinemia [4]. We tested our patient and found normal levels of haptoglobin in his serum.

There has been a long standing debate on whether crystalloids or colloids are better for volume resuscitation. Many recent studies showed no evidence that giving human albumin to replace lost blood in critically ill or injured people improves survival when compared to giving saline [5], and that In patients in the ICU, use of either 4 percent albumin or normal saline for fluid resuscitation results in similar outcomes at 28 days [6].

4. Conclusion

Considering the possibility of developing a severe anaphylactic shock to even the safer colloids like Albumin, although rare, should shift the medical community to a more conservative use of Albumin for volume resuscitation, specially under general anesthesia, when recognizing the signs and symptoms of anaphylaxis and the offending agent maybe more challenging.

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