



Case Report

Anaphylaxis to black widow spider antivenom^{☆,☆☆}

Abstract

Black widow spider envenomation is commonly reported to poison centers. Black widow spider envenomation produces a clinical syndrome, known as *latrodectism*, characterized by headache, nausea, vomiting, several muscle cramping and pain, joint stiffness, hypertension, and regional diaphoresis. Black widow spider antivenom (Merck & Co, Inc, West Point, PA USA) is an effective and relatively safe treatment option. There is 1 clear case of anaphylaxis secondary to black widow spider antivenom reported in the medical literature. Here, we report a case of anaphylaxis to antivenom. A 12-year-old boy presented to the emergency department (ED) with diffuse, severe pain 2 1/2 hours after being bitten by a black widow spider on the right lower extremity. In the ED, the patient failed analgesic therapy with fentanyl and was given black widow spider antivenom. Within 45 minutes, he exhibited signs and symptoms consistent with anaphylaxis, including wheezing, chest tightness, pruritus, and urticarial rash. The patient was given standard therapy for anaphylaxis, and all of his signs and symptoms (including the pain secondary to the black widow envenomation) resolved over 6 hours of observation. Leading experts agree that the use of antivenom is indicated in cases of severe envenomation not responsive to standard therapy. Despite concern that the antivenom is an equine-derived whole IgG and can precipitate early hypersensitivity reactions, there is only 1 other reported case of anaphylaxis to the antivenom in the medical literature.

Black widow spider envenomation produces a syndrome characterized by headache, nausea, vomiting, several muscle cramping and pain, joint stiffness, hypertension, and regional diaphoresis [1]. This syndrome, known as *latrodectism*, is

precipitated by the actions of α -latrotoxin, a black widow spider venom component. This toxin causes nonspecific opening of cation channels, which results in an increase in calcium influx and cytosolic calcium levels. As a result, there is exhaustive vesicular release of acetylcholine and norepinephrine from nerve terminals and endocrine cells [2,3]. Black widow spider envenomation is commonly reported to poison centers. Each year, approximately 2000 to 3000 cases are reported to the American Association of Poison Control Centers (AAPCC). Treatment regimens for *latrodectism* vary, including intravenous fluids, narcotics, benzodiazepines, calcium, and black widow spider antivenom. As of this writing, there is 1 clear case of anaphylaxis to black widow spider antivenom reported in the literature. Here, we report a case of anaphylaxis secondary to the administration of black widow spider antivenom.

A 12-year-old boy with no medical history presented to the ED 2 1/2 hours after being bitten by a black widow spider on the right lower leg. At home, the patient took 2 tablets of ibuprofen 200 mg with no relief from his pain. The intact spider was killed and brought to the ED for identification. The patient complained of bilateral calf and thigh pain, abdominal pain, and chest pain. The patient rated his pain as 8 out of 10; his vital signs were blood pressure (BP) 141/96, heart rate (HR) 93 beats per minute, respiratory rate (RR) 20, temperature 37.5°C, and room air oxygen saturation of 100% upon arrival; and inspection revealed minimal erythema surrounding the site of envenomation. Other elements of the physical examination revealed clear lungs bilaterally with no evidence of wheezing; a soft, nontender abdomen; and no stridor or changes in phonation. Fentanyl 50 μ g was administered, and after 35 minutes and reevaluation, the patient still described his pain as 7 out of 10. Another dose of fentanyl 50 μ g was administered. After a discussion with the patient and his mother, the decision was made to administer black widow spider antivenom (Merck). An additional dose of fentanyl 50 μ g was administered while the antivenom was being prepared and sent from pharmacy.

The patient received the antivenom skin test to the right medial forearm, developed no reaction after 20 minutes, and was subsequently given 1 vial (2.5 mL) diluted to a total volume of 250 mL in isotonic sodium chloride solution over 30 minutes per package insert protocol [4]. Approximately 45 minutes after administration of the

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antivenom, the patient developed bilateral eyelid edema and an urticarial rash, complained of pruritus on the chest and abdomen, and reported chest tightness associated with wheezing. At this time, the patient's vital signs were BP 137/92, HR 126, RR 30, and room air oxygen saturation of 97%. Intravenous fluids were given along with Solu-Medrol 125 mg, diphenhydramine 50 mg, famotidine 20 mg, 3 doses of nebulized albuterol 2.5 mg solution, and 2 doses of epinephrine 0.3 mL of 1:1000 solution intramuscular. After a 6-hour observation period, the patient described resolution of his chest tightness, and there was resolution of his wheezing and pruritus, improvement in his rash, and normalization of his vitals signs. The patient also reported that his pain had gone from "severe cramping" to feeling pain at the bite site, which he likened to "a paper cut." The patient was discharged from the ED to home with prescriptions for prednisone 60 mg by mouth daily and ranitidine 150 mg by mouth twice daily. A follow-up telephone call was done at both 3 and at 7 days after presentation, and the patient denied symptoms such as headache, malaise, abdominal pain, hematuria, arthralgias, or rash.

Most toxicologists agree that the use of antivenom is indicated in cases of severe envenomation not responsive to standard therapy [5]. The antivenom is whole IgG derived from horses that have been immunized with black widow spider venom [6]. This immunoglobulin binds venom in the blood and prevents its deleterious action at these channels and nerve terminals. Administration of the antivenom is, however, an introduction of foreign protein to the human immune system, and early hypersensitivity reactions can occur.

In a retrospective review of black widow spider envenomations, Clark et al [7] reviewed 163 cases presenting to a local urban hospital from 1982 to 1990. Of those patients, 58 (35.6%) received antivenom for therapy. Four of these patients developed an urticarial rash and did not develop bronchospasm. One patient who received the antivenom developed bronchospasm immediately after administration, had respiratory arrest, and died [7]. Of note, this individual had a history of asthma. No other cases of anaphylaxis to black widow spider antivenom are reported as of this writing.

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