

Use of Antivenin to Treat Priapism After a Black Widow Spider Bite

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ABSTRACT. Black widow spider envenomation (BWSE) is commonly associated with severe abdominal pain, muscle cramping, and hypertension. Treatment is primarily symptomatic with the use of opiates and benzodiazepines. Priapism is a complication of BWSE that has only rarely been reported. We describe a 17-month-old male who developed priapism after known BWSE. His priapism did not respond to opiates or benzodiazepines, and he was treated with black widow spider antivenin. Complete detumescence followed within several hours. The patient required no additional opiates for pain and was discharged from the hospital the following day. The patient's rapid improvement after antivenin suggests its efficacy in treating BWSE-associated priapism. *Pediatrics* 2004;114:e128–e129. URL: <http://www.pediatrics.org/cgi/content/full/114/1/e128>; black widow spider, priapism, children, antivenin.

ABBREVIATIONS. BWS, black widow spider; BWSE, black widow spider envenomation.

Black widow spider (*Latrodectus mactans*) bite envenomation (BWSE) in children, although still a potentially serious and deadly event, is often better tolerated in children than in healthy adults.¹ Typical effects include severe abdominal pain, muscle cramping, and hypertension. There is often a transient target lesion at the bite site. Priapism is an unusual manifestation of BSWE that has seldom been reported.^{2,3} Treatment with antivenin to BWS toxin is currently recommended for severe envenomation associated with severe pain unrelieved by opioid analgesics or life-threatening hypertension.^{4,5} Therapy for priapism has not been well delineated.

We describe a child with documented BWSE who developed priapism after initial management with narcotics and benzodiazepines. Administration of antivenin was associated with rapid improvement in abdominal pain and complete resolution of his priapism.

CASE REPORT

A previously healthy 17-month-old male developed acute irritability, crying, and left foot pain on the morning of hospital admission. The patient's mother removed his shoes and found a

dead BWS in the child's left shoe. Swelling of the entire left foot developed rapidly, and he was taken to a local emergency department for evaluation. On examination he was hypertensive (highest recorded blood pressure: 145/103 mm Hg) and tachycardic (heart rate: 160–180 beats per minute). Examination revealed edema and erythema of the left foot and the eyelids, and no classic target lesion was seen at the bite site. He demonstrated evidence of significant pain. Serum glucose was elevated to 186 mg/dL, and his white blood cell count was increased to 17 000/mm³. He was treated with diazepam, morphine, and diphenhydramine before transfer to Children's Healthcare of Atlanta at Egleston (Atlanta, GA). On transfer to the pediatric intensive care unit ~5 hours after the spider bite, he remained irritable and in pain, with a firm, but not rigid, abdomen and remarkable erythema of the left foot.

The patient was managed with intermittent intravenous morphine and lorazepam, with moderate control of pain and anxiety. Approximately 9 hours after the envenomation, anuria was noted and he was found to have a penile erection. The patient's mother recalled that his erection had been present at all diaper changes during his hospitalization since the spider bite. Bladder catheterization obtained 100 mL of urine.

Urology was consulted, and priapism was diagnosed. Their examination noted erect corpora and flaccid glans, consistent with high-flow (nonischemic) priapism. The corpora detumescenced with compression, but the erection returned on release.

After discussion with the poison control center and the patient's family regarding the risks and benefits of antivenin, we elected to treat the patient with BWS antivenin. On recommendation from our local toxicology consultant, the patient received diphenhydramine, methylprednisolone, ranitidine, and acetaminophen as premedication before antivenin for possible allergic reaction. He was given 1.25 mL of antivenin, one-half of an adult-dose full vial. Within 30 minutes of antivenin, his priapism had almost resolved and his abdominal tenderness was improved. The remainder of the antivenin-dose vial was administered at this point. Complete detumescence followed within 2 hours. On later examination, the patient achieved partial erection with manipulation and spontaneous resolution. Edema and erythema of the foot was improved, and abdominal signs resolved. He required no additional opiate doses since antivenin administration and was discharged from the hospital without symptoms on the day after admission.

DISCUSSION

The syndrome of BWSE usually involves a pinprick sensation at the bite, which is brief in duration. Severity of envenomation depends on the size of the spider, depth of the bite, and the age and size of the victim. Children, the elderly, and persons with cardiovascular disease are considered at high risk for serious complications and worse symptomatology.⁵ Approximately 30 to 60 minutes after envenomation, proximal muscle cramping, particularly of the chest, abdomen, and back, occurs. Symptoms can progress to waxing and waning muscle rigidity and severe pain. Findings can often be confused with an acute abdomen, especially in children. Autonomic nervous system stimulation by venom produces nausea, vomiting, sweating, hypertension, and tachycardia. Treatment is generally supportive, and only those

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patients who require repeated doses of medication to relieve symptoms warrant hospital admission.⁶

Treatment is primarily symptomatic, with the use of opiates and benzodiazepines for the management of pain and muscle spasms. Calcium gluconate was previously recommended as the treatment of choice, especially in patients who arrived ≥ 3 hours after being bitten.⁷ However, it was later shown to be ineffective in 96% of patients in a review of 163 cases by Clark et al.⁸

Clark⁹ further showed that antivenin was safe and extremely effective in relieving BWSE symptoms. Antivenin is associated with known risks of immediate hypersensitivity and anaphylaxis and can produce serum sickness up to 7 to 10 days after administration.^{6,8} This risk is the same for a half a vial or a full vial, and the dosing of antivenin should be the same in adults and children. Because the goal is neutralization of the venom, the entire vial should be administered. This may have accounted for our patient's partial resolution until the entire vial of antivenin was given. Woestman et al¹ found that antivenin seemed to bring relief safely to patients in a recent review of 12 children, none of whom developed priapism. Use of BWS antivenin is currently recommended in patients <5 or >60 years old with BWSE and respiratory difficulty, marked hypertension, or patient distress not responding to other measures. Antivenin should be administered only in a location where anaphylaxis can be treated, such as an emergency department or intensive care unit.

Priapism is a pathologic condition of penile erection that persists beyond or is unrelated to sexual stimulation.¹⁰ Peak incidence in children is from ages 5 to 10 years and is usually associated with sickle-cell disease or some other hemoglobinopathy.¹¹ Priapism is thought to occur because of a disturbance in the regulatory mechanisms that maintain penile flaccidity. Priapism can be separated into 2 distinct hemodynamic forms: low flow (ischemic) or high flow (nonischemic).¹² Low-flow priapism results from a decrease in venous outflow from the penis and is characterized by venous stasis and penile ischemia. It is usually a painful, rigid erection characterized clinically by absent cavernous blood flow. Low-flow priapism beyond 4 hours results in a compartment syndrome and requires emergent medical intervention.¹⁰ High-flow priapism results from increased arterial flow into the cavernosal sinusoids, which overwhelms venous outflow, leading to persistent erection.¹² High-flow priapism is often caused by groin or straddle trauma that results in injury to the internal pudendal artery or its branches.¹³ Priapism with BWSE has only rarely been noted. In 1982, Stiles² reported treatment with antivenin for presumed BWSE in a 4-year-old with distress, muscle rigidity, hypertension, and priapism. Symptoms were consistent with BWSE, but no spider exposure or puncture wound was documented. The patient

had dramatic improvement in his muscle rigidity and discomfort within 30 minutes of antivenin, but priapism and hypertension took >12 hours to resolve. In a case report from Chile, the authors reviewed 89 cases of BWSE and reported only 1 case of priapism. Although latrodectism is relatively uniform throughout the world, some variation in unusual effect might occur, making the incidence of priapism in South America less relevant. Neither the age of the patient nor his specific treatment were given.

One postulated mechanism for priapism in BWSE is through release of neurotransmitters such as acetylcholine and epinephrine, leading to diffuse neuromuscular, autonomic, and central nervous system effects.¹⁴ BWSE may cause overstimulation of the parasympathetic system, resulting in smooth muscle relaxation and increased blood flow into the sinusoids. Priapism also could be caused by the release of acetylcholine at the neuromuscular junction, with resulting obstruction to penile venous outflow by spasm of the ischiocavernosus and bulbocavernosus muscles.²

In our patient, priapism failed to resolve with opiates or benzodiazepines and prompted treatment with antivenin rather than surgical urologic intervention. The patient's rapid improvement after antivenin suggests that it is effective in treating this aspect of the BWSE syndrome as well as other symptoms.

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