

Rob Prongay, MD;
Gary Kelsberg, MD
Valley Family Medicine
Residency, Renton, Wash

Sarah Safronek, MLIS
University of Washington
Health Sciences
Library, Seattle

ASSISTANT EDITOR
Jon O. Neher, MD
Valley Family Medicine
Residency, Renton, Wash

Q / Which treatments relieve painful muscle spasms from a black widow spider bite?

EVIDENCE-BASED ANSWER

A / **OPIOIDS RELIEVE PAIN** and benzodiazepines ease muscle spasms in most patients with latrotoxicism—widespread, sustained spasms—resulting from envenomation by a black widow spider (strength of recommendation [SOR]: **C**, case series).

Black widow-specific antivenin appears to shorten duration of symptoms and reduce hospitalization more than symptomatic treatment, but can cause allergic reactions, including anaphylaxis and death from acute and delayed serum reactions

(SOR: **C**, case series).

A similar antivenin against the redback spider, a close relative of the black widow, produces clinical effects that are equivalent whether they're given intravenously (producing measurable serum levels) or intramuscularly (producing no measurable serum levels) (SOR: **B**, randomized controlled trial [RCT]), raising the possibility that the antivenin might not be effective at all.

Calcium gluconate appears ineffective for symptom relief (SOR: **C**, case series).

Evidence summary

A bite by the black widow spider (*Latrodectus mactans*) is painful but rarely fatal. No deaths have resulted from more than 40,000 reported bites in the United States.¹ Envenomation may cause latrotoxicism, a syndrome characterized by widespread, sustained muscle spasms. Victims also may have significant hypertension, autonomic and central nervous system dysfunction, and abdominal pain severe enough to be mistaken for an acute abdomen.² Our literature search didn't find any RCTs comparing the efficacy of general symptomatic treatment with administration of specific antivenin against black widow spider bites.

Relief with opioids, benzodiazepines, but not with calcium gluconate

A retrospective case series that evaluated 163 patients who had been bitten by a black widow spider found that IV opioids and benzodiazepines (most often diazepam) relieved symptoms in most patients. Black

widow-specific antivenin improved severe symptoms, albeit at the risk of causing allergic complications (antivenin contains whole immunoglobulin G from horses).³

Patients were 8 months to 88 years old (average age 31.6 years); 99 (61%) were male. Investigators reviewed their medical records and categorized symptom severity as mild (asymptomatic or local pain only, 9%), moderate (muscle or abdominal pain with normal vital signs, 37%), or severe (generalized back, chest, or abdominal pain; nausea, headache, and abnormal vital signs, 54%). Physicians treated moderate or severe symptoms with IV opioids (49 patients), IV opioids in combination with benzodiazepines (44 patients), or IV antivenin (58 patients). (Treatment was not specified for 12 patients.)

Treatment relieved pain in 55% of patients taking opioids alone and 70% using both opioids and benzodiazepines. All 58 patients who received antivenin reported complete symptom resolution after an average of

31±27 minutes. Of 24 patients with moderate or severe symptoms who initially received calcium gluconate (mean dose 1400 mg) alone or with a muscle relaxant, 96% continued to have symptoms requiring further treatment. (Numbers add up to more than 163 because some patients received multiple types of treatment.)

Benefits of antivenin come at a price

In this study, antivenin administration shortened total symptom duration (9±23 hours with antivenin compared with 22±25 hours without; $P<.05$) and reduced the need for hospitalization (number needed to treat with antivenin=3, no comparative statistics supplied).³ However, antivenin complications triggered 80% of the hospital admissions associated with its use (total complication rate 9%, number needed to harm=11). Antivenin caused 4 cases of generalized urticarial reactions. A patient who had asthma and multiple drug allergies died from severe bronchospasm when physicians gave him undiluted IV antivenin.

Supportive care and antivenin show similar results in a small study

A second retrospective case series found no difference in length of hospitalization or long-term outcomes in 14 patients, 6 of whom were treated with supportive care (methocarbamol and calcium gluconate) and 8 with antivenin.⁴ The study didn't include patients treated in the emergency department and didn't categorize severity of symptoms, however.

Is antivenin ineffective?

Additional information on horse serum antivenin comes from studies of Australian redback spider bites. An RCT of 126 patients

treated with either IV or IM antivenin for moderate to severe symptoms of redback latrodectism found statistically equal clinical relief of pain at 2 hours (63% vs 53%, respectively; 95% confidence interval, -8% to 26%).⁵ However, investigators measured serum antivenin levels in a random sample of 20 patients and found that IV administration of antivenin produced a measurable level, while IM administration did not. In light of the fact that IV and IM administration were associated with equal pain relief and that the IM route didn't produce a measurable serum level, the investigators raised the possibility that the antivenin might not be an effective treatment.⁶

A case series in which Australian physicians treated 1972 redback spider bite victims with antivenin reported delayed serum reactions in 1.7% and anaphylaxis in 0.5%.⁷

Recommendations

A wilderness medicine text recommends admitting all symptomatic children, pregnant women, and patients with hypertension to the hospital after a black widow spider bite.² The authors commented that severe pain and muscle spasm usually respond to IV narcotics or benzodiazepines.

They noted that *Latrodectus* antivenin may prevent systemic sequelae and should be used in pregnant women and patients with respiratory arrest, seizures, or uncontrolled hypertension. For patients with less severe symptoms, the authors recommend weighing the value of antivenin against the risks of acute hypersensitivity and delayed serum sickness. They reported that redback antivenin is effective in 94% of patients in Australia and that Australian data show anaphylaxis rates of 0.5% to 1%. **JFP**

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Opioids relieve pain and benzodiazepines ease muscle spasms in most patients with latrodectism.

References

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