

Mediterranean Black Widow Spider (*Latrodectus Tredecimguttatus*) Poisoning in a Metropolitan City in Turkey

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Abstract

Introduction: Black widow spider bites cause severe poisoning (latrodectism) with symptoms such as muscle spasm, rigidity, pain, vomiting, hypertension, and tachycardia. Although *Latrodectus mactans* (*L. mactans*) is the most well-known species to cause latrodectism, it has not been reported in Turkey. We report a poisoning case caused by *Latrodectus tredecimguttatus* (*L. tredecimguttatus*) spider a species known to be in Turkey for the first time in the literature.

Case: A 35-year-old male patient presented with complaints of pain in the lower extremities and excessive sweating due to a spider bite. Discomfort, agitation, a sweaty appearance, tachycardia, and hypertensive attack were observed in the patient. Because black widow antivenom is not available in Turkey and because of the continuation of symptoms despite treatment for 12 hours in the emergency department, the patient was transferred to the intensive care unit, where he was given IV sedoanalgesia. Nicardipine infusion was administered to treat hypertension attack. The patient's symptoms improved on the fifth day. The dead spider that was brought in was identified by an expert biologist as *L. tredecimguttatus*.

Conclusion: It should be considered that latrodectism due to *L. tredecimguttatus* spider bite may be resistant to emergent treatment and hospitalization may be required.

Keywords: black widow; *Latrodectus tredecimguttatus*; poisoning

Introduction

Latrodectism is a syndrome characterized by vomiting, tachycardia, and hypertension in addition to severe spasm, rigidity, and pain in the muscles, and it is caused by alpha-latrotoxin, which is found in the venom of black widow spiders (*Latrodectus* spp.)^{1,2}. Although *L. mactans* is the most well-known species to cause latrodectism, it has not been reported in Turkey³. In addition, other *Latrodectus* species distinction has not been made in previously published poisoning cases^{4,5}. This paper presents a poisoning case caused by the Mediterranean black widow *L. tredecimguttatus* spider that occurred in a metropolitan city, the capital of Turkey.

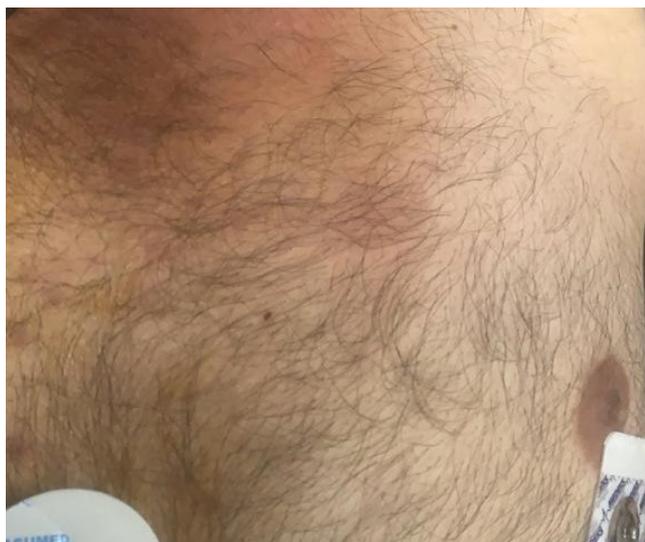
Case

A 35-year-old male shepherd who was otherwise healthy woke up in a field in Ankara, the capital of Turkey, with left chest pain and saw a black insect and killed it. Shortly

after, he went to the hospital with severe pain at the bite site and in all of his joints, and the following medications were administered: methyl prednisolone, pheniramine maleate, a nonsteroidal anti-inflammatory drug (NSAID), ketamine, and tetanus vaccine. However, as the patient's complaints persisted, he was referred to our tertiary care hospital.

The patient was observed to be sweaty, restless, and agitated on admission, and he had severe pain, especially in the lower extremities and at the bite site. His vital signs were BP: 153/122 mmHg, P: 120/min, F: 36.7 °C, RR: 20/min, and SaO₂: 96%. A hyperemic area of approximately 2×2 cm was found on the left anterior aspect of the patient's chest (Fig 1). The results of other physical examinations were considered normal. The results of his blood tests were Hb: 11.7 g/dl, Wbc: 17.460/mm³, and platelets: 446.000/mm³. The results of venous blood gas analysis, liver function tests, kidney function tests, coagulation tests, troponin measurement, and complete urine analysis were all within normal limits. His total creatine phosphokinase (CK) was measured as 282 U/L, and his ECG revealed sinus tachycardia.

During the patient's 12 hour stay in the emergency department, H1 and H2 receptor antagonists (pheniramine



maleate, 45.5 mg, and ranitidine 50, mg, intravenous (IV)), methyl prednisolone (40 mg, IV), diclofenac Na (75 mg, intramuscular (IM)), tenoxicam (20 mg, IV), fentanyl (100 µg, IV), paracetamol (1 g, IV), thiocolchicoside (4 mg, IM), and diazepam (10 mg, IV) were administered, but the pain, sweating, and restlessness could not be controlled. Fortunately, the patient brought in the dead spider that bit him, and because the clinical findings were compatible with poisoning, it was thought that his condition may be black widow poisoning, which is very rare in Turkey and the region. However, the spider's species distinction was not clearly made at that time. Because black widow antivenom is not available in Turkey and because his symptoms continued, the patient was transferred to the intensive care unit.

On the second day, CK increased to 2749 U/L, AST to 75 U/L, and ALT to 52 U/L. Sedoanalgesia (fentanyl, midazolam, dexmedetomidine) and non-steroidal anti-inflammatory drugs were administered to the patient for pain control for 5 days. IV metoprolol and a glyceryl trinitrate infusion were administered for blood pressure control, and when no response was obtained, a nicardipine infusion was started. The patient was discharged from the hospital on the eighth day. During this time, the dead spider that the patient brought with him was examined by a biologist, who is an expert on spiders, and it was determined to be *L. tredecimguttatus* (Fig 2).

Discussion

The *Latrodectus* spiders are called Black Widows because of their powerful venom, and they are found in different parts of the world. The best known and most dangerous is *L. mactans*, which is found in North America³. *L. tredecimguttatus* lives in regions extending from Central Europe to Central Asia, the Caucasus, North Africa, and Saudi Arabia⁶. It lives in the

Marmara, Mediterranean, and Central, Eastern, and South-eastern Anatolia regions in Turkey⁷. Although it is common in all Mediterranean regions, the incidence of *L. tredecimguttatus* poisoning is very low⁶. It primarily lives in steppes and grasslands and can be a major problem in areas where grain is harvested by hand. These spiders bite if disturbed, and the female, which is 7–15 mm in size, is responsible for poisoning. Some have red spots on the dorsal surface of the abdomen, and some may be completely black⁶.

The venom released in bites by *Latrodectus* spiders contains the neurotoxin α -latrotoxin (α -LTX), which has neurological and autonomic effects in humans. This venom stimulates the release of neurotransmitters, such as acetylcholine, catecholamines, and glutamate, in humans^{1,2}. Muscle spasms and head, back, lower extremity, and abdominal pain develop because of the increase in acetylcholine. Pain is an almost universal feature of latrodectism. In more than half of cases, pain increases within the first hour and often spreads to the extremities or may result in abdominal pain mimicking acute abdomen. Pain is typically severe and difficult to treat, lasting from hours to days^{2,6,8}.

Systemic effects are present in 20–30% of cases and severe sweating in approximately 70%. Other symptoms such as restlessness, nausea and vomiting, high fever, increased secretions, tremor, increased reflexes, paresthesia, priapism, and ptosis may also develop in patients^{6,8-10}. Hypertension develops in less than 10% of cases⁶. In Turkey, a few cases of acute myocardial injury and severe hypertension resistant to antihypertensive therapy have been reported^{9,11,12}. In a study published by Isbister and Fan in 2011, local pain was reported in 90% of 56 *L. tredecimguttatus* bite cases and sweating in 55%, while hypertension, agitation, and pain spreading to the extremities were not observed². In the *L. tredecimguttatus* bite case presented here, the patient experienced pain that spread to the extremities, agitation, severe sweating, and treatment-resistant hypertension.

The diagnosis of latrodectism is based on a history of a spider bite and consistent clinical findings in patients. There is no analytical method for detecting the neurotoxin α -latrotoxin in blood, urine, or the bite site². Tests that can aid in monitoring and treatment include complete blood cell count, electrolytes, CK, and urinalysis. Leukocytosis, albuminuria, and increased CK are common laboratory findings^{8,10}. Obtaining an ECG and cardiac enzymes are recommended, especially in *L. tredecimguttatus* bites². In our case, there were no ECG findings except tachycardia. Troponin at follow-up remained within normal limits.

Between 1982 and 1990, 163 cases of black widow spider envenomation in the USA were reviewed and categorized according to severity as grade 1, 2, or 3¹³. Patients (grade 1) who were asymptomatic, except for local pain at the bite site, accounted for 9% of all cases. Patients (grade 2) with muscle pain in the bitten extremity, muscle pain spreading to the abdomen if bitten on a lower extremity, muscle pain spreading to the chest if bitten on an upper extremity, local sweating at the bite site or extremity, and stable vital signs constituted 37% of all patients. Widespread muscle pain in the back, abdomen, and chest; sweating outside the bitten area; and abnormal vital signs such as hypertension, tachycardia, nausea, vomiting, and headache were present in 54% of all patients (grade 3). The most common laboratory findings were increases in white blood cell count, CK levels, and lactic dehydrogenase levels¹³. Our case was determined to be grade 3 in severity, and leukocytosis and an increase in CK levels were observed.

The goal for the treatment of latrodectism is pain control. However, pain control can be difficult, often requiring large doses of pain medication and/or hospitalization. Although there is no evidence that analgesics are effective, muscle relaxants and non-opioid and opioid analgesics are well tolerated and considered suitable for the symptomatic relief of pain². The dose administered is similar to that for other acute painful disorders and should initially consist of a combination of non-opioid and opioid oral analgesia. Persistent pain should then be treated with parenteral opioids, such as intravenous morphine. In patients with latrodectism, benzodiazepines can be used to treat restlessness, muscle spasm, and increased adrenergic activity, such as hypertension, tachycardia, and sweating^{2,8}. Although some previous studies have indicated that the IV use of 10% Ca gluconate will produce immediate and long-term relief of muscle pain by lowering the depolarization threshold at the neuromuscular junction, there is little information on the effects of calcium and magnesium, and therefore, they are currently not recommended^{1,2,8}. In our case, pain and sweating that were resistant to various analgesic and sedative drugs were observed for about 5 days.

Developed hypertension will usually respond to treatment with antivenom, but patients with underlying medical problems and severe hypertension may require additional

antihypertensive therapy. Hospitalization may be required in cases where antivenom is not available or in hypertensive situations that are not suitable for antivenom and/or do not respond to treatment¹³. One case study reported that peripheral vasodilators and beta-blockers were not effective in the treatment of a pediatric patient with severe hypertension, but blood pressure returned to normal after the venom wore off⁹. In our case, who had no previously known hypertension diagnosis, there was no response to IV nitroglycerin and a beta blocker, IV nicardipine treatment was administered, and blood pressure was brought under control after a few days.

To date, a number of antivenoms have been developed against specific *Latrodectus* spp. in various parts of the world, including Australia and America. Among these, *L. mactans* antivenom (Antivenom *L. mactans*, Merck Sharp & Dohme®) and *Latrodectus* spp. antivenom (Aracmyn Plus, Instituto Bioclon®) are not available in Europe. Although the use of antivenom is controversial, one study has claimed that it provides rapid pain relief and reduces hospitalization or re-admissions to the emergency department¹⁴. However, these previous studies were on *L. mactans* species. Although no scientific report has described the use of *L. mactans* antivenom to treat *L. tredecimguttatus* poisoning, this antivenom was reported to be effective in one case in Italy¹⁵. However, it should be taken into account that antivenoms have serious side effects. In our case, antivenom was not used because it was not available in Turkey.

Conclusion

It should be kept in mind that a patient who comes to the emergency department in Mediterranean region with complaints of muscle, joint, and abdominal pain resistant to treatment as well as hypertension, tachycardia, and sweating as a result of an insect bite may have latrodectism syndrome caused by the bite of the Mediterranean black widow spider (*L. tredecimguttatus*), and hospitalization may be required.

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