



Spider Bite in Iran

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Abstract

Some of the world's most dangerous spiders have been certified in some areas of Iran. Spider bites are common in some geographical areas, and are sporadic in some regions. Spider bites can be classified as latrodectism or loxoscelism. If the patient had not seen the spider, the clinical manifestations of latrodectism could be easily mistaken for other types of bite or sting; or an infectious disease, and withdrawal symptoms, and also loxoscelism could be mistaken for cellulitis, various types of skin infection, or even a sting from a Gadim scorpion (*Hemiscorpius lepturus*). Given the nonspecific presentation of spider bites, one must keep the diagnosis in mind, and question patients, regarding possible exposure to spiders. Physicians recommend becoming familiar with the geographical distribution of Iranian dangerous spiders, clinical manifestations, and management of their bites. The most useful treatment for spider bite is anti-venom administration. Producing spider bite anti-venom in the Razi Vaccine and Serum Research Institute is under investigation.

Keywords: Spider Bite, Mediterranean Widow Spider, Mediterranean Recluse Spider, Latrodectism, Loxoscelism

1. Introduction

Spider bites are common worldwide, and spider bite epidemics have been reported in countries such as Italy, Spain, and the USA (1). Some of these epidemics were caused by spiders that live in some provinces of Iran (2-5). In recent years, cases of spider bite have been reported from suburban areas of Shiraz, which could not have been diagnosed if the patients had not seen the spiders. Spider bites are relatively common in Khorasan Razavi province (6-9). There are also only two other case reports of spider bite from the south of the country (10) and Bandar-Abbas (11). Lack of reports on spider bites from other areas of Iran does not mean that there are no dangerous spiders or no events of spider bites in these areas; failure to diagnose spider bites may be one of the reasons. If the patient had not seen the spider, the clinical manifestations of latrodectism would have been easily mistaken for other types of bite or sting, an infectious disease, or severe withdrawal symptoms (for example, due to the chronic abuse of opioid substances in combination with buprenorphine), and the clinical manifestations of loxoscelism may also be easily misdiagnosed as cellulitis, a particular skin infection, or Gadim scorpion (*Hemiscorpius lepturus*) sting. (11). Based on the importance and prevalence of spider bites in Iran, the Razi Vaccine and Serum Research Institute has been conducting investigations to produce an anti-venom serum against spider bites. It is important that physicians in Iran are familiar with the geographical distribution of dangerous spiders, the clinical manifestations and management of their bites. Accordingly, based on spider bites reports from Iran and personal experiences, in this editorial, the subject of spider bites in Iran is reviewed and discussed in detail, which may be beneficial for Iranian physicians.

2. Discussion

So far, more than 46,000 spider species have been identified worldwide, about 200 species' venom of which is dangerous to humans (5). With the exception of two spider families, they all have venomous glands, but they are not

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usually dangerous to humans, due to many reasons, such as the spider's small fang size, low amount of injected venom, little damage effect of venom, and spiders' behavior and life style. (5). More than 600 species have been registered in Iran, out of which six species are dangerous to humans, five species belong to the widow spider group (*Latrodectus* spp.), and one belongs to the recluse spider group (*Loxosceles* spp.) (5). Table 1 demonstrates the names, characteristics, and the provinces in which the spiders were observed, and Figure 1 depicts their images. Reports on spider bites from Iran include only Mediterranean widow and recluse spiders, and there is no information regarding bites from other species (Table 1) (6-11).

Table 1. Different species of dangerous spiders reported from different geographical areas of Iran

Scientific name	General name	General characteristics	The province(s) in which the spider was observed
<i>Loxosceles rufescens</i>	Mediterranean recluse spider	Brown color with a violin-shaped marking on the dorsum of the cephalothorax	Tehran, Hormozgan, Khorasan Razavi, Fars, Mazandaran, Alborz, Qom
<i>Latrodectus tredecimguttatus</i>	Mediterranean widow spider, <i>Dolmak</i>	The Iranian mature species is completely black which may be mistaken for a Dahl widow spider at first sight. The immature species have orange-red spots (mostly 13 spots) on the abdomen	Alborz, East and West Azerbaijan, Alborz, Bushehr, Tehran, Khorasan Razavi, North Khorasan, Semnan, Qom, Golestan, Mazandaran, Hormozgan, Fars, Khuzestan,
<i>Latrodectus dahli</i>	Dahl widow spider	The female is completely black and the male is in light black color	East Azerbaijan, Bushehr, North Khorasan, South Khorasan, Khorasan Razavi, Fars, Hormozgan
<i>Latrodectus geometricus</i>	Brown widow spider	The color varies from white to brown. Leg straps have dark and light colors with different geometric shapes on dorsal part of abdomen	Khorasan Razavi
<i>Latrodectus pallidus</i>	White widow spider	Brilliant white color of the abdomen; legs are light brown	Alborz, Bushehr, Khorasan Razavi, South Khorasan, Semnan, Qazvin, Hormozgan
<i>Latrodectus cinctus</i>	Red-back widow spider, Round widow spider	Black color with an orange to red longitudinal marking on the dorsum of the abdomen	Bushehr, Hormozgan, Khuzestan

2.1. Clinical manifestations and management of Mediterranean widow spider bite (latrodectism)

The Mediterranean widow spider (*Latrodectus tredecimguttatus*) is called *Dolmak* in Khorasan Razavi province. Bites by this species have been only reported from Mashhad. According to Afshari et al. (6, 7), this spider lives close to the ground, in farms, or around human habitation, and usually bites people outdoors. This spider commonly bites forearms and lower legs for reasons that it hides in shoes and because wheat can fall on the farmers' exposed forearms when harvesting. The common clinical manifestations of bites are mild burning sensation at the bite site, local pain, tingling feeling which begins after a while, red color halo around the bite site, diffused pain in the involved extremity, abdominal and pelvic pain, profuse sweating, chills, restlessness, dyspnea, flushing, muscular spasm, nausea, vomiting, and vertigo. It is also reported that there would sometimes be no obvious signs of a spider bite. In twenty-five percent of the cases, ST depression was reported in at least two precordial leads. Dysrhythmia and myocarditis may also occur. Increase of the creatine phosphokinase (CPK) level was also reported in some cases. There is an interesting phenomenon called washerwoman's hand's syndrome and happens following several days of profound sweating which can cause wrinkles in the skin of bitten patients' hands. Death, due to this type of spider bite, is rare, but it may lead to death following pulmonary edema, cardiac complications, and disseminated intravascular coagulation (DIC). In recent years, there have been two cases of *L. tredecimguttatus* spider bites from suburban areas of Shiraz, one of whom was presented with burning sensation at the site of bite, abdominal, chest, and back pain with severe agitation, hypertension, tachycardia, and increased CPK. The clinical presentations of the patient were at first very similar to that of someone who had severe withdrawal symptoms (due to the chronic use of methadone in combination with buprenorphine). The patient showed fever and profound sweating approximately 24 hours after the bite. However, there was no evidence of a bite at the bite's location. The biting spider was immature with orange-red spots on the abdomen, similar to species found in other countries (Figure 2).



Figure 1. A, *Loxosceles rufescens* (photo: Alireza Zamani), B, *Latrodectus tredecimguttatus* (photo: Parham Beyhaghi), C, *Latrodectus dahli* (photo: Amir Talebi Gol), D, *Latrodectus geometricus*, E, *Latrodectus pallidus* (photo: Ali Mohajeran), F, *Latrodectus cinctus* (photo: Ali Mohajeran)



Figure 2. Immature *Latrodectus tredecimguttatus* with red-orange spots on its dorsal abdomen

The other case had burning sensation at the bite site, diffused pain in the involved extremity, abdominal and pelvic pain, profound sweating, severe agitation, headache, tachycardia, and increased CPK. Similarly, no sign of a bite

was observed at the bite site. The spider was completely black. Although there is no information regarding other *Latrodectus spp.* bites in Iran, it can be expected that the clinical manifestations of biting by other spiders of this group are similar to those of Mediterranean widow spiders, with lower or higher severity.

2.2. Treatment

The most useful treatment for latrodectism is anti-venom administration. Producing spider bite anti-venom in the Razi Vaccine and Serum Research Institute is under investigation. Therefore, the treatment of latrodectism is currently supportive including observation, administration of fluids, analgesics (morphine, pethidine, apotel or nonsteroidal anti-inflammatory drugs [NSAIDs]), muscle relaxant (methocarbamol and diazepam), calcium gluconate, and anti-histamine and steroids in the event of allergic reactions (7).

2.3. Clinical manifestations and management of Mediterranean recluse spider bite (loxoscelism)

The Mediterranean recluse spider (*Loxosceles rufescens*) mostly lives in residential areas and houses. This spider keeps itself hidden among clothes, bed sheets, and beneath objects. It is active during the night and is usually non aggressive (5, 6). So far, several cases of Mediterranean recluse spider bites have been reported from Bandar-Abbas, Mashhad (8), and southern areas of the country (10, 11). Clinical manifestations in bitten patients at first included mild burning sensation at the site of bite; papules, pain, erythema, and itching occur after several hours. The cytotoxic reactions usually occur in the second to sixth days after the bite, which lead to cellulitis, severe pain, and swelling accompanied by systemic manifestations such as fever, nausea, and sweating. Skin necrosis occurs at the site of bite from one to two weeks after the bite. The systemic toxicity rarely leads to coagulopathy, hemolysis, and renal failure (from the third day to the seventh day after bite) (8, 11). In recent years, two cases of *L. rufescens* bite have been reported from suburban areas of Shiraz. The first case presented with mild burning sensation and swelling at the bite site. The swelling increased after a couple of days. A slight skin necrosis had occurred at the site of bite after several days. Other clinical manifestations were not observed in the patient. The other case presented with mild burning sensation and pain at the site of the bite. After five to six hours, the patient developed generalized flushing and rash. The swelling and pain at the bite site increased in two to three days, and slight skin necrosis was developing. If the patient had not seen the spider (*L. rufescens*), the spider bite may not have been diagnosed or may have been mistaken for a Gadim scorpion sting, which is painless, skin infection (such as the infection caused by methicillin-resistant *Staphylococcus aureus*), or dermatitis (11).

2.4. Treatment

Anti-venom administration is the exact treatment for loxoscelism, but is not available in Iran. Thus, as latrodectism, the treatment of loxoscelism is supportive at present including observation, washing the site of bite with water and soap, applying ice pack to reduce erythema, swelling, itching, and pain, avoiding debridement of the skin lesion, avoiding use of topical steroids, administration of tetabulin, tetanus vaccine if necessary, administration of analgesics, anti-histamine, and antibiotics. Systemic steroids, dapsone, and topical tetracycline are also recommended (11-13).

3. Conclusions

Some of the world's most dangerous spiders have been certified in some geographical areas of Iran. Spider bites are relatively common in Khorasan Razavi province, but there are some other reports from other areas. Given the geographical distribution of dangerous spiders in Iran and nonspecific presentation of spider bites, when the patient had not seen the spider, one must keep the diagnosis in mind and question patients regarding possible exposure to spiders. Spider bites can be presented in two forms of latrodectism and loxoscelism. In spider bite cases, the patients should be hospitalized, and the serum level of calcium (Ca), potassium (K), sodium (Na), blood urea nitrogen (BUN), creatinine (Cr), complete blood count (CBC), platelet count (PLT), prothrombin time (PT), partial thromboplastin time (PTT), international normalized ratio (INR), creatine phosphokinase (CPK), and urine analysis (U/A) should be checked. At present, the treatment of spider bites in Iran is supportive. In addition, tetabulin and, if necessary, the tetanus vaccine should also be administered. It is important that Iranian physicians are familiar with the geographical distribution of dangerous spiders, (particularly the areas in which they practice), clinical manifestations, and management of their bites. Administration of anti-venom is the most useful treatment for a spider bite, the production of which is under investigation in the Razi Vaccine and Serum Research Institute.

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Conflict of Interest:

There is no conflict of interest to be declared.

References:

- 1) Hahn IH. Arthropods. In: Hoffman RS, Howland MA, Lewin NA, Nelson LS, Goldfrank LR, eds. Goldfrank's Toxicologic Emergencies. 10th ed. New York, New York: McGraw-Hill, 2015: 1461–79.
- 2) Mirshamsi O, Marusik YM, Zamani A, Moradmamand M, Kashefi R. Annotated checklist of the spiders of Iran (Arachnida: Araneae). Iranian Journal Of Animal Biosystematics (IJAB), Fauna Iranica 2015; 11(1): 1-108.
- 3) Zamani A, Mirshamsi O, Savoji A, Shahi M. Contribution to the distribution of spiders with significant medical importance (Araneae: Loxosceles and Latrodectus) in Iran, with a new record for the country. Iranian Journal of Animal Biosystematics (IJAB). 2014;10(1):57-66.
- 4) Zamani A, Rafinejad J. First Record of the Mediterranean Recluse Spider *Loxosceles rufescens* (Araneae: Sicariidae) from Iran. J Arthropod-Borne Dis. 2014;8(2):228-31. PMID: 26114138. PMCID: PMC4478436.
- 5) Zamani AR. The field guide of Spiders and Scorpions of Iran. 1st ed. Tehran, Iran: Iranshenasi Publisher, 2016: 102-6. [in Persian]
- 6) Afshari R, Khadem-Rezaiyan M, Balali-Mood M. Spider bite (latrodectism) in Mashhad, Iran. Hum Exp Toxicol. 2009;28(11):697-702. doi: 10.1177/0960327109350668. PMID: 19812122.
- 7) Afshari R, Monzavi SM. Natural Toxins. In: Afshari R, Monzavi SM, eds. Management of Patients in Triage and Clinical Toxicology Ward. 3rd ed. Mashhad, Iran: Mashhad University of Medical Sciences, 2011: 221-31. [in Persian]
- 8) Mirshamsi O, Hatami M, Zamani A. New record of the Mediterranean Recluse Spider *Loxosceles rufescens* (Dufour, 1820) and its bite from Khorasan Province, northeast of Iran (Aranei: Sicariidae). Iranian Journal of Animal Biosystematics (IJAB). 2013;9(1):83-6.
- 9) Rafijened J, Tirgari S, Biglarian F, Shemshad KH. Systematics, Bioecology, and Medical Importance of Widow Spiders (*Lathrodectus* spp.) in Khorasan Province, Iran. Iran J Arthropod-Borne Dis. 2007;1(1):52-7.
- 10) Ansari SH, Salehi S. Coagulopathy after spider bites in a six-year-old boy. Tehran Univ Med J. 2008; 65 (12): 84-7. [in Persian]
- 11) Shahi M, Shahi A, Khademi Z, Zamani AR, Nakhaii AR, Rafinejad J. Loxoscelism: a case report from Bandar Abbas in south of Iran. Hormozgan Med J. 2014;18(5):465-71.
- 12) Swanson DL, Vetter RS. Loxoscelism. Clin Dermatol. 2006 May-Jun;24(3):213-21. PMID: 16714202.
- 13) King LE Jr. Common ground?: Tetracyclines, matrix metalloproteinases, pustular dermatoses, and loxoscelism. J Invest Dermatol. 2007 Jun;127(6):1284-6. PMID: 17502857.