The Spider Club of Southern Africa

Are spiders dangerous?

by Eugene de Kock

Spiders belong to the class of mainly terrestrial Arthropods known as Arachnida. Medically significant classes of arachnids include spiders, ticks & mites and scorpions. Unfortunately through myths, legends and nowadays media, spiders have gained a reputation for being dangerous and harmful, and in some people instil a psychological fear known as Arachnophobia. In reality very few are dangerous to man and media reports exaggerating the dangers of spider bites are far out of proportion to the actual threat they pose.

Which spiders bite and may be harmful to man in South Africa?

The most important groups of spiders based on the medical consequences if bitten by one, are shown in the table below:

Latrodectus sp.	Black & Brown Button Spiders
Loxosceles sp.	Violin Spiders
Cheiracanthium sp.	Sac Spiders
Sicarius sp.	Six-Eyed Sand Spiders

We do not know for sure if the venom of the majority of spiders has any effect on man – they simply do not bite us! However, the venom produced by medically important spider bites is generally either neurotoxic or cytotoxic. Web dwellers tend to have neurotoxic venom and non-web dwellers cytotoxic venom. Spiders of the *Latrodectus* genus produce neurotoxic venom, while the Violin Spider, Yellow Sac Spider and Six-Eyed Sand Spider produce cytotoxic venom.

Button Spiders (Neurotoxic Venom)

Black Button Spiders (There are four species in South Africa)

Latrodectus renivulvatus - Found over most of South Africa
Latrodectus indistinctus - Found in the western parts of the Cape & up into Southern Namibia
Latrodectus karooensis - Found in the Karoo
Latrodectus cinctus - Found in the eastern parts of South Africa (KZN & Eastern Cape)

Female Black Button Spiders are black with an irregular cream and/or reddish marking on the dorsal (upper) side of the abdomen. The males are tiny in comparison to the females, have alternating black and creamy stripes across their abdomens and they are too small to bite humans.

The egg sacs of the Black Button Spiders are smooth and cream coloured; they are usually spherical and sometimes pear shaped. Unlike those of the Brown Button Spider, there are NO SPIKES on these egg sacs.

Brown Button Spiders

(There are two species in South Africa)

Latrodectus geometricus - Found all over South Africa
Latrodectus rhodesiensis - Found over small areas in Gauteng, Mpumalanga, Northern Cape and Limpopo Province

The Brown Button Spiders have varied colouring from creamy white, through brown to black, with a variety of markings on the dorsal (upper) side of the abdomen and they always have red or orange hourglass shaped markings on the ventral (under) side of the abdomen. It is important to note that the venom glands of Brown Button Spiders are considerably smaller than those of the Black Button species and bites are therefore less serious.

The egg sacs of *L. geometricus* are spherical with small silken spikes all over, while the egg sacs of *L. rhodesiensis* are also spherical, but with thick fluffy silk covering them making them appear twice as large as those of any other button spider. Egg sacs of all species may contain up to 400 eggs, which will hatch within three to four weeks. The hatchlings are highly cannibalistic and therefore most of the young will be consumed by their brothers and sisters.

Button spiders construct three dimensional webs near ground level with a funnel shaped retreat of very strong silk to the side of the web where the spiders lurk by day, and they seldom willingly leave their webs.

Violin Spiders (Cytotoxic Venom)

Violin Spiders, *Loxosceles sp*, are normally brown to reddish brown in colour with dark markings on their bodies, and a characteristic violin-shaped marking on the cephalthorax, although this violin shaped marking is not as distinct on our South African species. A second identifying characteristic of the Violin Spider is the presence of only three pairs of eyes, whereas most spiders have four pairs of eyes.

Violin Spiders are nocturnal wanderers which rest in their webs by day. Webs, if they are present, are rudimentary in most species and the silk is bluish hackled silk. The natural habitat of the Violin Spider includes the underside of fallen wood and logs, and they are very commonly found in caves all over South Africa.

Mating in this species occurs from February to September, and females lay their eggs in flattened egg sacs that are attached to the underside of objects. Up to 40 spiderlings may hatch from a single egg sac and a single female may produce up to five egg sacs in a summer. Females of the Violin Spider can live up to four years, males less.

Sac Spiders (Cytotoxic Venom)

Sac spiders, *Cheiracanthium sp*, are readily recognized by their pale colour (fawn, yellow to yellowish green). A salient feature is the arrangement of the legs, two pairs directed forwards and two pairs backwards with the first pair being much longer than the others. The tips of the legs and the mouthparts are usually darkly coloured.

Sac spiders are commonly found outdoors and only one species *C. furculatum* is regularly found in houses. There they may spend the day in, for example, folds of curtains, bedding and clothing on a clothesline in a soft silk sac-like retreat.

Six-Eyed Sand Spider (Cytotoxic Venom)

Six-Eyed Sand Spiders, *Sicarius sp*, AKA Six-Eyed Crab Spiders, are brown spiders frequently covered with sand particles that adhere to their body. They have a crab-like appearance. They are sand-living spiders and all the species are found only in the more arid regions of Southern Africa.

The venom of this spider has only been tested on animals and studies on rabbits indicate that the venom may cause massive local tissue destruction and that serious internal haemorrhage may develop.

What are the signs and symptoms of spider bites?

The signs and symptoms of spider bites depend on many factors; these include:

- Neurotoxic or cytotoxic venom
- Amount of venom injected
- Health of the patient (e.g. allergies)

- Age of the patient (small children and elderly are more adversely affected)
- Site of the bite

The signs and symptoms from a bite from a spider with neurotoxic venom differ to those produced by a spider with cytotoxic venom. The severity of the symptoms depends on the species of spider as the symptoms of bites from different species of*Loxosceles* can range from unremarkable, localised, dermonecrotic, to systemic.

• Affects neuromuscular junctions • Severe pain in chest and abdomen (cramp-like pains) • Breathing difficulties, heart palpitations • Nausea and vomiting • Sweating, fever, excessive salivation • Increased blood pressure • Rash may develop • Symptoms usually start about 1-3 hours after being bitten • More severely affected are children and elderly	• Affects cellular tissue and usually restricted to area of the bite • Initial bite is painless but symptoms develop about 2-8 hours later, area becomes painful and swollen • Eventually a blister may form over a necrotic lesion which then sloughs to create an ulcerated wound (up to 10cm) • Ulcer will heal over months and leave behind a scar. In extreme cases, skin grafts may be necessary • In severe cases, systemic conditions may occur, e.g. thrombocytopaenia, DIC, renal failure

What are the specifics for the different spider bites?

Button Spider Bites

The venom of the *Latrodectus* species contains a protein neurotoxin known as a-latrotoxin, which binds with high affinity to a specific presynaptic receptor, setting in motion a massive release of neurotransmitters, mainly acetylcholine and noradrenaline. The medical condition caused by a *Latrodectus* bite is called Latrodectism.

Clinical features:

- There is a burning pain at the bite site, which typically spreads to the regional lymph nodes within 15 minutes, causing it to become tender and palpable.
- Within an hour there are generalized muscle pain and cramps, which may be accompanied by a feeling of tightness in the chest as well as tremors and weakness when walking.
- Profuse sweating.
- A painful facial grimace, with facial oedema.
- Fever, nausea, vomiting, headache and lacrimation, hypertension, tachycardia or bradycardia, and speech disturbances.

Dermatological features:
The skin around the site of the bite is red. In untreated cases a rash may develop after several days. Systemic symptoms are of more diagnostic value.

Treatment of Latrodectism:

- Patients with neurotoxic symptoms require hospitalization and monitoring of vital signs for at least 24 hours.
- Systemic signs and symptoms should be treated with *Latrodectus* spider anti-venom (obtainable from the South African Vaccine Producers (Pty) Ltd, Tel: (011) 386-6000). One 5ml ampoule should be given intramuscularly, or diluted in 50ml saline and given intravenously over 15 minutes. The dose is identical for adults and children. Precautions against anaphylaxis must be taken.
- 10ml of a 10% Calcium Gluconate solution intravenously may give transient relief from cramps.

- Intravenous fluid should be administered to keep the patient hydrated.
- The bite should be topically cleansed, but no bandage or injection or other interference applied.
- Opioids should be avoided.
- Tetanus toxoid should be administered.
- Patients should be kept under observation for 12 hours after cessation of treatment.

It is important to note that deaths from Latrodectism are extremely low: Less than 5% of untreated cases before 1960, and NO recorded deaths in the last 5 decades.

Differential diagnosis:
Acute abdomen, scorpionism, snakebite, alcohol withdrawal, organophosphate poisoning and myocardial infarction.

Violin Spider Bites

Violin Spider Bite Images

Clinical features:

- Initial bite may be painless, although pain might manifest after several hours.
- No anti-venom is available for violin spider bites in South Africa, and treatment of the bites is directed at preventing or limiting secondary infection and promoting healing.
- Violin Spider bites may require surgical debridement and even skin grafts.
- These bites require tetanus toxoid booster.

Dermatological features:

The dermatological features depend on the severity of the bite. In self-healing wounds, the bite site gets no worse than being swollen and red. With more serious bites a “bulls-eye” wound may form. This is characterized by a central red swollen blister that is separated from a peripheral bluish region by a white zone of firm swelling. If the bite turns a purplish colour within the first few hours, this usually indicates severe necrosis (localised tissue death) may occur. Over days the blister will form a scab, which hardens and falls off to leave behind an ulcerated depression. Healing can take weeks to months. Interestingly, it appears that bites that become systemic do not also develop necrotic wounds. It is thought that in necrotic wounds the venom is localized in the tissue whereas in systemic reactions the venom is distributed quickly throughout the body without any localised effects.

Treatment:

- Treatment of the bites is directed at preventing or limiting secondary infection and promoting healing.
- These bites require tetanus toxoid booster.

Differential diagnosis:
Cellulitis, Necrotising anaerobic fasciitis, insect stings and tick-bite fever.

Sac Spider Bites

Sac Spider Bite Images

Clinical features:

- Sac Spider bites are not very painful, although there might be extensive erythema, regional lymphadenitis,scarlatiniform rash and a transient fever.
- Bites may progress to Cellulitis which requires systemic antibiotics.
- The Sac Spider bite limits itself after 10 days.
- Sac Spider bites require tetanus toxoid booster.

Dermatological features:
These bites are red, swollen and itchy, and they may produce a slightly necrotic wound that heals without scarring.

Treatment:

- Treatment of the bites is directed at preventing or limiting secondary infection and promoting healing.
- These bites require tetanus toxoid booster.

Differential diagnosis:
Cellulitis, Necrotising anaerobic fasciitis, insect stings and tick-bite fever.

Six-Eyed Sand Spider Bites

Bites by the Six-Eyed Crab Spider are uncommon: there are NO proven cases of these bites and only TWO suspected cases where the culprit was never identified. But experiments done on rabbits suggest that Sicarius bites may be lethal.

Clinical & Dermatological features:

- The experimental bites resulted in purple discoloured weals that developed into 5cm to 10cm lesions with 2cm to 3cm black, necrotic central zones, which disintegrated when touched after 6 hours.
- The rabbits died after 5 – 12 hours after being bitten.
- Autopsies revealed extensive subdermal tissue damage and petechial haemorrhages in the liver, lungs and heart.
- Death was by respitory failure.
- Biochemical evidence of disseminated intravascular coagulopathy (DIC) developed in the rabbits.

Treatment:
Treatment of the bites is directed at preventing or limiting secondary infection and combating DIC if it develops.

General treatment for spider bites

One of the most important aspects in treating spider bites is to try and identify the offending spider. The venom of spider bites is quite variable hence identification of the spider can be of value in determining the management of the condition.

General measures that should occur after a spider bite include:

- Wash the area well with soap and water.
- Apply a cold flannel or ice pack wrapped in cloth to the site.
- Give paracetamol for pain.
- If symptoms occur medical attention should be sought.

References:

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