Case Report

Clinical presentation and outcome of Sri-Lankan Ornamental Tarantula *Poecilotheria fasciata* spider bite: a case report

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Abstract
We report on a 19-year-old boy with visible muscle spasms admitted to the hospitals 24 hours after spider bite. He was treated effectively with intravenous calcium gluconate followed by oral calcium supplements and made a full recovery 48 hours after the incident. Although no specific treatment exists in Srilanka, it has been suggested that calcium supplements may be beneficial to relieve the muscle spasms. Our patient made a full recovery with calcium supplements suggesting the treatment with calcium is beneficial in relieving the pain and muscle spasms caused by Sri-Lankan Ornamental Tarantula Poecilotheria fasciata.

Key words: Sri Lankan Ornamental Tarantula; *Poecilotheria fasciata*; Venom

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How to cite: Dinamithra N.P, Sivansuthan S, Johnson P,Nishshanka J.G.P. Clinical presentation and outcome of Sri-Lankan Ornamental Tarantula *Poecilotheria fasciata* spider bite: a case report. *Anuradhapura Medical Journal* 2013;**7**(1):10-12
DOI: http://dx.doi.org/10.4038/amj.v7i1.6136

Introduction

Throughout history, envenoming by animal toxins has fascinated humans. Animal toxins have made a vast contribution to enhancing knowledge in human physiology and pharmacology. Information on the nature and mechanism of action of these toxins has enabled a more scientific approach to the treatment of their intoxications. Early and specific treatment is frequently required after envenoming and often includes life support and maintenance of vital functions by mechanical ventilation, intra venous fluid and drug therapy. Spider bites are associated with a mortality of 1-17% in Chile, Brazil(1), the Mediterranean region, Israel, North Africa and some regions in the former Soviet Union. Most spiders have neuroactive substances in their venom(2), which are characterized by different affinities by a series of different receptors and ionic neuronal channels(3). During the predation, spiders inject neurotoxins which are able to cause paralysis of their prey due to the blocking actions at the neuromuscular junctions and/or at the central nervous system (CNS); generally the voltage-gated sodium (Nav) and voltage-gated calcium (Cav) channels constitute the most common targets of these toxins(3,4). Spider bites are mostly accidental and usually they do not attack animals larger than themselves, some have aggressive behavior and will attack when approached by larger animals. Most spider bites on humans are unintentional and happen when they press up against spiders and receive a defensive bite. We report on a 19-year-old boy with visible muscle spasms admitted to the hospitals 24 hours after spider bite.

Figure 2 **Offending spider Sri-Lankan Ornamental Tarantula** *Poecilotheria fasciata*

Case presentation

A 19-year old boy from Karainagar (9° 44' 53.07"N 79° 52' 58.38"E) in Jaffna District admitted with right upper arm pain and spasms of tricep muscle after 24 hours of a spider bite to right foot. He was bitten by the spider at about 4 p.m.at home garden while he was trying to take a photograph of the spider. Offending spider was identified by the experts with the help of the photographs brought by the patient (Figure 1)(5,6). Just after the bite he noticed a severe pain at the site with local swelling without any other systemic symptoms. He had taken 2 tablets (1 gram) of paracetamol orally to relieve the pain.

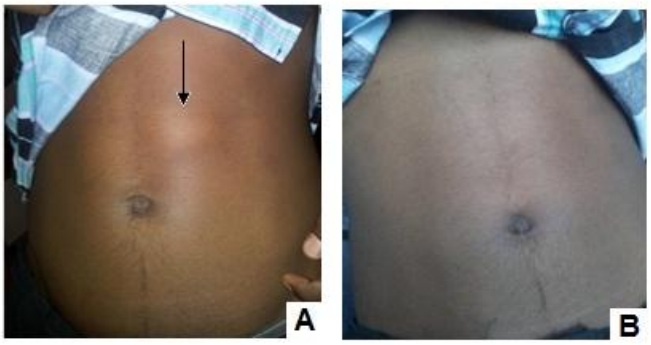

Figure 1 **A. Visible muscle spasms (indicated by arrow), B. Disappearance of muscle spasms one hour after intravenous calcium gluconate therapy**

Twenty four hours after the incident he developed painful muscle spasms over right upper arm which made him to get admitted to the hospital. On admission he was in pain with visible muscle spasms over right tricep region, his pulse rate was 40 beats / minute, respiratory rate 18 cycles / minute, and blood pressure was 120/80 mmHg. He was treated with 1 gram of paracetamol and 4 miligram of Chlopheniramine oraly . His symptoms were subsided after 4hours of the onset (28 hours the bite).

After 4 hours (28 hours the bite) he again complained of severe abdominal pain mainly over epigastric region where visible muscle spasms was obvious. (Figure 2 A).Then he was treated with slow bolus of intravenous 10% calcium gluconate 10 milliliter over 10 minutes. He made a good recovery after 1hour followed by a few short lasting episodes of right triceps, right calf and rectus abdominis muscle spasms which were not as severe as the previous.

On physical examination all the systems were normal except bradycardia of 40/minute revealed as a sinus bradycardia on 12 lead ECG. Blood investigations Alanine Transaminase(ALT)- 20, Asparate Transaminase (AST)- 29,WhiteBlood Count (WBC)-7000,Haemoblobin (Hb)-13gram/deciliter, Mean Corpuscular Volume (MCV) -86 Femto liter, Platelets -328,000/micro liter, Blood Urea 22milligram/deciliter, Serum Na-144, K-4.7, Serum Calcium (after IV Calcium Gluconate)-9.10milligram/deciliter (8.10-10.40) with normal Urine full report.

After treatment (at 28 hours after the bite) with single dose of intravenous Calcium gluconate and oral calcium lactate 300 milligram thrice daily , the patient improved rapidly (Figure 2 B)and was discharged from hospital after 24 hours of admission (48 hours of the bite) with calcium lactate 300mg thrice daily for three days.

Discussion

The clinical presentation and treatment modalities of Poecilotheria fasciata bite is not well documented in medical literature and there is no specific treatment for

that. Antivenoms are available for Latrodectus, Atrax and Loxosceles bites in many countries. These species are not reported in Srilanka. Exact mechanisms of muscle spasms after Poecilotheria fasciata spider bite is yet to be identified. Pain and muscle spasms caused by spider bites are refractory to standard treatments but are relieved by intra venous calcium(7). Effectiveness of calcium gluconate is challenged in some studies[8]. Although calcium gluconate has been considered the first-line treatment of spider bite it is ineffective for pain relief compared with a combination of intravenous opiods and benzodiazepines(8). Tarantula toxins inhibit activation of voltage-activated potassium (Kv) channels by interacting with their voltage-sensing domains.They might cause the disturbance of skeletal muscle excitability responsible for the tonic muscle spasms that have been described.

Possibly most relevant to our case of Poecilotheria fasciata bite. It is postulated that the tonic spasms were the result of a direct effect of venom neurotoxins acting on voltage-gated sodium and/or calcium channels in the victim's muscles(9). Our patient had a total plasma Ca2+ concentration of 9.10milligram/deciliter (8.10-10.40) after intravenous Calcium Gluconate which was towards the lower end of the normal range, hinting that Ca2+ might have entered the muscle fibres under the influence of the putative spasm-producing toxin.Our patient had a heart rate of around 40 beats per minute all throughout his hospital stay as well as two weeks review which we attributed to his normal heart rate.

The clinical presentation depends on many variables, including the amount of venom injected. There is usually only one bite, which may cause cutaneous or systemic manifestation or both. Other organs may be involved, including the gastrointestinal system. The pancreas, renal, pulmonary, and cardiovascular systems are less commonly affected (10, 11).

Signs and symptoms occurring within hours to 36 hours post envenomation are typically abdominal pain, nausea, vomiting, fever, often > 39 to 40°C, myalgia and artheralgias, headaches, fatigue, and weakness.Most spider bites are harmless, and require no specific treatment. Treatment of bites may depend on the type of spider; thus, capture of the spider—either alive, or in a well-preserved condition, is useful.

Treatment for non-poisonous spider bites include washing the bite with soap and water and ice to reduce inflammation (10). Analgesics and antihistamines may be used, however antibiotics are not recommended unless there is also a bacterial infection present (10) There have been reports of significant bites by Poecilotheria species, occasionally resulting in hospitalization. Symptoms include localized pain and swelling, exhaustion, moderate to severe muscle cramping, labored breathing and fever, sometimes delayed days after the initial bite.

Conclusion

Although no specific treatment exists in Srilanka, it has been suggested that calcium supplements may be beneficial to relieve the muscle spasms. Our patient made a full recovery with calcium supplements suggesting the treatment with calcium is beneficial in relieving the pain and muscle spasms caused by Sri-Lankan Ornamental Tarantula (Poecilotheria fasciata).

However, there is little documented clinical evidence of the effects of this (Poecilotheria fasciata) spider bite in humans, so firm conclusions about the level of danger posed by this spider cannot be drawn.

Funding

None

Competing Interests

None

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