Necrotic Araneism A Review of the *Loxosceles* Genus. III. Prevention, Control and Case reports

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ABSTRACT

These spiders are nocturnal and eat other bugs like cockroaches and crickets. Male brown recluse spiders wander farther than females and will crawl into shoes or other clothing. Spider bites can usually be prevented by simple personal and domestic measures. Control measures and prevention are methods for avoiding bites. To avoid brown recluse spiders, avoid keeping clothing on the floor, store clothing and shoes inside plastic containers, and shake out all clothing that has been in a hamper before wearing or washing. Since the *Loxosceles* poisoning is regarded as a public health problem in many countries of the American continent and worldwide, we consider some recommendations given here may be useful for avoiding spider bites, but also for giving medical attention to this kind of patients. This article reports clinical cases seen at the ISSSTE Family Medicine Clinics in México City. They were victims of “violin” spider bites. In general, a very long time is required to heal the affected tissue because of it is complicated with ulceration.

Key words: Arachnidism, *Loxosceles*, Necrotic arachnidism, Necrotic ulcer, “Violin” spider, Venomous spiders, Spider envenomation

Introduction

It is often recommended to be careful when placing one’s hand in dark and hidden places and shaking clothes and shoes when stored for long periods of time[1,2]. Remove and decrease the amount of garbage and items that accumulate in homes. Maintain beds separate from walls at least by 10 cm. The use of pesticides should be limited due to the risk of poisoning[2,3]. Insecticides are inefficacious leading to the development of better biological control methods[4]. Direct applications are recommended in corners and common hideouts and not by using sprays[3]. In cases of severe infestations, the periodic application of contact sprays containing piretrines is recommended especially during the summer. Slow-releasing formulas are more effective (micro-capsules and humid powder)[5,6]. Cleanliness should be emphasized to avoid the proliferation of insects[7]. Remove spiders and their webs carefully from under beds and behind headrests[8]. Keep children from going through drawers or toys that have been kept in warehouses or attics for some time[3]. Yellow-light or sodium vapor light bulbs should be placed at home entrances since they are less attractive then mercury vapor, fluorescent and incandescent light bulbs[5,9,10]. Use vacuum cleaners or brooms to remove webs, spiders and eggs sacs[5,10]. Place mosquito nets and floor guards on doors and windows[10,11].

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Heating systems often create a favorable environment for the installation and development of these arachnids[12]. Making noise before entering a dark and dirty room is recommended[13]. Another form of detecting and controlling infestation is placing sticky strips or adhesive pads on walls and corners with which a large number of spiders are often caught (Figure 1)[10].

Some suggested preventive measures for workers are: a) cleanliness, vacuum cleaning and keeping items in an orderly fashion, especially in and around dark corners, and holes in walls. Make sure they are insect-free. b) do not store unnecessary items and those hardly used that may be a storage sites for insects; c) maintain furniture, chairs and closets away from walls, d) keep work clothes and shoes in lockers. Maintain them clean. e) shake work clothes and shoes before putting them on, especially if kept hung on the wall or stored for a long time, f) avoid the use of hangers or nails on walls for hanging clothes (towels), g) do not leave work clothes and shoes in places easily accessible to spiders (on the floor, behind doors, in the bathroom, etc.), h) look through places before introducing hands for cleaning the site (behind paintings, on shelves, when switching on lights, etc.), i) use personal protection devices (masks, gloves, safety shoes, among others) do not have other body parts exposed to bites when cleaning and transporting things, and j) train workers on the risk of spider bites and prevention methods on loxoscelism[14]. It is known that Loxosceles has a predilection for carton boxes used as filing cabinets[15].

In case there are barns with livestock and activities carried out with cattle, remember spiders are attracted to wood artifacts. We recommend that they should be disinfected on a regular basis using gloves, long sleeved shirts and long pants and thick boots, as well as avoid eating/feeding to avoid attacks and attracting them towards the animals[16]. Cases have been reported when plague control of fruit trees have been conducted. Grass should be kept at a height under 7 cm avoiding vegetation from being in contact with walls and livestock barns[17]. The recommended first aid measures for spider bites are: 1) when possible identify and capture the spider to assess whether poisonous or not; 2) keep the victim and surrounding bystanders calm. Bites are treatable. 3) keep the victim resting and in a comfortable position, avoiding unnecessary movements, 4) if necessary due to a state of anxiety or nervousness, immobilize the affected area in a functional position, 5) if swelling develops, keep the affected area elevated, 6) is possible, wash the affected area with soap and water, 7) do not use disinfectants or antiseptics that dye the area and mask the severity of the bite, and 8) transfer to an emergency room[18].

Fig. 1: Adhesive pad for catching and detecting Loxosceles spider genera[10].

Case reports (ISSSTE)

“Fuentes Brotantes” Family Medicine Clinic

Case 1

This is a case report of a 57 year old male dentist, from the Federal District (Mexico City) working at the Public Safety Ministry and without a previous history of importance related to this case. While at his job, he was changing his clothes and reported feeling a bite and afterwards a mild itching sensation on a maculopapular lesion in the frontal part of his left leg. He shook his pants and out fell a brown spider about 2 cm in size. Twenty-four hours later, he had a flinctena 1.5 cm in diameter with a perilesional erythema and intense itching. The next day, he developed edema with erythema and cyanosis from the knee to the ankle with an increase in local temperature, intense pain to the touch, 39.2ºC fever, myalgias, arthralgias, lipothemia and syncope. He is taken to a private hospital where he remains in the ICU for five days due to anaphylactic shock. The description of the arthropod is provided to the health personnel mentioning its compatibility to Loxosceles reclusa.

He is later seen at the outpatient clinic and treated with amoxicillin and clavulanate (500 mg/125 mg/tid/v.o. and nimesulide (100 mg/bid/v.o.). He refers a necrotic ulcer measuring 3 cm in diameter with an extensive loss of epithelial and subcutaneous tissue with the formation of “bumps”, moderately intense pain and difficulty in walking (Figure 2). He is told to continue the same treatment and come in for wound washing on a daily bases. After four weeks, three necrotic satellite ulcers develop. Five months later, when signs of tissue regeneration are apparent, he is sent to plastic surgery where grafts are inserted achieving total re-epithelialisation within a two month period.
Fig. 2: A) Multiple ulcers three months after the attack by Loxosceles in a 57 year old male. B) Observe the important loss of epithelial and subcutaneous tissue.

Fig. 3: A) Necrotic ulcer five days after being bitten by a non-specific spider. B) Reestablishment of the dermal tissue by granulation with the re-epithelialisation of the border after 5 weeks. C) Wound in process of tissue remodelling after 11 weeks.

Case 2

This is a case report of a 48 year old female from Mexico City with history of importance related to the case. During her return from Uruapan (Michoacán), she started with moderate itching on the side of her left leg. She presses the area with her hand and when shaking her pants, sees a brown spider fall without further identifying it. Eight hours afterwards, she has a small white vesicle with an erythematous base and intense itching. Two days later, the vesicle measures 2.5 cm in diameter and decides to see a physician. She is given dicloxacillin (500 mg/tid/v.o.) and indicated to not debride the wound. Forty-eight hours later, she has a fever and arrives at her clinic where her wound is debrided leaving a residual ulcer 2.5 cm in diameter and given dicloxacillin 1 g/tid/v.o., paracetamol 500 mg/tid/v.o. and a gauze with furocinamid. Four months later, the ulcer has a necrotic halo 4 mm thick and a moderate loss of subcutaneous tissue.

The treatment scheme is modified by adding a tetanus shot, ampicillin 500 mg/tid/v.o. and a gauze pad impregnated with acexamic acid to be applied to the gauze after cleansing, achieving complete healing 76 days after the event and without requiring plastic surgery (Figure 3).

"Tlalpan" Family Medicine Clinic Cases 3 and 4

These two cases are comprised by a 48 year old female and 53 year old male couple, both from Mexico City. She is a housewife with a history of chronic alcoholism and he is a Civil Engineer with a Master Degree in Planning with a history of being bitten by a black widow spider on his right earlobe with the use of an antidote and cleansing at the Hospital Infantil de México in 1948, clearly identifying the arthropod. In January of 1998, they arrived at an apartment they owned in Colonia La Joya, Tlalpan Delegation which had been temporarily abandoned where they decide to spend
the night after a morning bath with aromatic herbs. The next morning, the wife had difficulty breathing and later dies due to asphyxia secondary to laryngeal edema. The husband refers right hemiparesis, important edema of the ipsilateral hand, two dark micropunctures approximately 4 mm apart and satellite flictena in the radial face of the wrist with intense pain, loss of equilibrium, erythematosus cutaneous lesions with thoracic flictena, muscle spasms in the left half of the body and psychomotor agitation.

He is admitted to the Emergency Room and Intensive Care Unit and diagnosed as having been bitten by an insect, with systemic affection and a 25 day hospital stay due to dermatosis disseminated to the scalp, back of his hand, forearm and external lateral and posterior faces of the right thigh characterized by indurated plaques constituted by erythema and central vesicles with important edema in the right half of the body and paralysis of the hand and ipsilateral pelvic extremity. In addition, there is renal failure secondary to rhabdomyolysis four days old that required a blood transfusion, hemodialysis on two occasions and specific medication. Biopsies were carried out finding toxic epidermal necrolysis and papillary dermal necrosis compatible with a lesion by venom from *Loxosceles reclusa*. Patient was sent to physical therapy having acute rhabdomyolysis, acute renal failure in recovery, neuromuscular changes with spasticity of the right hand and 50% dysfunction of his wrist, 60-70% decrease in strength and a presumptive diagnosis of right hemiparesis secondary to exogenous toxicity. Similarly, he is provided psychological help due to his depressive state of mind due to his condition and the loss of his spouse. Renal centellography results show bilateral calectasia with right predominance and mild parenchymal damage; electromyography and potentials suggest demyelinising and axonal polyneuropathy affecting the sensorial-motor sensations of all extremities.

As sequelae, the patient suffers the neurological manifestations described, hyperchromatic spots on the flank and right iliac quadrant (Figures 4-6), residual scar 3.5 cm long in the anterior face of the right thigh and vascular cortipathy. Two years later, the patient has generalized tonic-clonic seizures and is treated with carbamazepine (200 mg/bid/vo).

**Results and Discussion**

As reported in the majority of the publications, the current statistics do not reveal the identification of the arthropod, which lacks for registering the real incidence of lesions by necrotic arachnidism. The patient’s evolution coincides with that described by several authors in reference to the local, systemic and mixed presentations caused by the bites, registering two as evolving satisfactorily, one with neurological sequelae and one patient dying. In the majority of the known cases, there is no mention of neurological damage. However, Braz described the presence of neurotoxic peptides in the venom of *L. intermedia*. The treatment was different and the response variable which may be due both to the
individual’s susceptibility as well as to the intraspecific toxic differences of the venom.

In conclusion, the following recommendations are suggested: A) when attacked by any anthropod, the insect must be caught and taken to the healthcare center for their identification under a simple looking glass (10x)[10,19], transported in a bottle containing 70% alcohol. These measures will allow for selecting the proper treatment. B) Do not self-medicate, C) seek immediate medical attention. Any delay may lead to grave consequences, D) remain as calm as possible and be cooperative with the healthcare personnel, e) wash the affected area with soap and water, F) shake clothing and shoes before dressing, g) maintaining areas clean is the most efficient control method for keeping spiders away, h) fumigate periodically, preferably during the summer and fall months, i) do not accumulate unnecessary objects j) teach children on the dangers of having direct contact with spiders, k) if bitten on the job, immediately seek attention to be transported to a care center, letting others know of your accident. A work related injury should be thoroughly investigated[14]. No reports have been published on cases of diabetic patients that have been bitten by spiders of these types however we consider it convenient to alert all physicians on these types of patients where the recovery of the lesions is in itself complicated.

References