What's Eating You? Tarantulas (Theraphosidae)

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Tarantulas belong to the family Theraphosidae, which contains more than 900 species of hairy and often very large spiders (Figure). Depending on the species, the tarantula's body length ranges from 1 to 4 in with 3- to 12-in leg spans. At 12 in, the largest reported species is the Goliath bird-eating spider (*Theraphosa blondi*). The tarantula's body consists of 4 pairs of legs that terminate in retractable claws, allowing the spider to grip and climb. Two additional pointed appendages called chelicerae are located just below the eyes and are used to grip food and prey. They contain the venom glands that allow the spider to immobilize and kill its prey.[1]

In addition to the regular hairs that cover the spider's body, most New World species possess barbed urticating hairs that can be released to defend the spider when it feels threatened. Located on the dorsal surface of the abdomen, the hairs are dislodged when the spider rapidly vibrates 1 or both of its hind legs.[2] Once released, the hairs travel similar to arrows, giving them the ability to penetrate deeply into the eyes and other tissues and to cause prolonged localized urticaria in skin.[3] Histologically, skin lesions may demonstrate hairs that have penetrated both the stratum corneum and stratum malpighii. Occasionally the hairs may extend as deep as the reticular dermis. The greatest potential for injury results if the hairs enter the eye. Inflammation can occur at all levels of the eye from the cornea to the retina. Opthalmia nodosa, a chronic granulomatous reaction, may result from tarantula hair penetration but also is associated with vegetable fibers or other arthropod hairs.[4-9]

Tarantula.

Secondary glaucoma and cataract formation also have been reported.[10] Patients suspected of having ocular injuries should be seen by an ophthalmologist and examined with a slit lamp.[11] Management includes topical steroids and antibiotics as well as removal of the hairs, which may be difficult or impossible.[4-9,12] Some species of tarantulas may incorporate urticating hairs into silk, which is used to create egg sacs and silk mats on which they molt. Egg sacs and silk mats containing urticating hairs are more effective at stopping the movement of the larvae of the fly (*Megaselia scalaris*), which can infest and kill the eggs. However, the egg sacs fail to illicit an urticarial response in humans and mice.[13]

In addition to their mechanically irritating properties, tarantula hairs act as allergens in individuals handling tarantulas regularly, such as researchers. Symptoms of the hypersensitivity that may result include skin irritation, pruritus, coryza, sneezing, conjunctivitis, and angioedema. IgE titers specific to the urticating hairs are increased in the exposed group when compared to controls, indicating a systemic allergic response.[14]

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Common Medical Problems

New World species (including Theraphosidae): Urticating hairs

Urticaria

Hypersensitivity reaction: skin irritation, pruritus, coryza, sneezing, conjunctivitis, angioedema

Joint swelling

Old World species: Venom

Systemic neurotoxic effect

Muscle spasms

Tarantula venom is a complex mixture of many different compounds and has been shown to contain adenosine, histamine, and serotonin.[15,16] In addition to these compounds, there are several toxins that affect potassium channels,[17] sodium channels,[18,19] stretch channel receptors,[20,21] and capsaicin receptors, all producing inflammation.[22] Another toxin, GsMTx4, induces analgesia by blocking mechanosensitive channels and reducing mechanical and neuropathic pain. The toxin, therefore, has potential to be clinically used as a pain treatment.[23] Although this elaborate chemical cocktail can be fatal to potential prey and even larger mammals such as canines,[24,25] it has not been shown to cause death in humans. Several studies have reported that most bites to humans result in mild to severe local pain, erythema, joint swelling, muscle cramps, itching, and tenderness that can persist for hours after the bite.[24,26,27] Old World tarantulas from Asia, Africa, and Australia have shown to be more problematic to humans than their New World counterparts, as their bites may cause systemic neurotoxic effects. In the absence of antivenom, severe persistent muscle spasms can remain for weeks after the bite.[28]

Because of the popularity of tarantulas as pets, it is important to be aware of the possible consequences caused by urticating hairs and bites (Table). Owners should be made aware of these potential hazards. Reputable dealers sell safer species, but more dangerous New World species often are sold or traded as pets, resulting in human injury.

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