



White-tailed spider bites – arachnophobic fallout?

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Abstract

Aim To investigate if public concern regarding the toxic effects of the bites from white-tailed spiders, *Lampona cylindrata* and *L. murina*, is reflected in the case histories of patients admitted to Christchurch Hospital with a diagnosis of spider bite.

Methods The case histories of patients admitted to Christchurch Hospital with a diagnosis of 'contact with venomous spiders' were examined for evidence that the patients developed necrotising arachnidism.

Results Ten patients were admitted to Christchurch Hospital between January 2001 and January 2003 with a diagnosis of 'contact with venomous spiders'. We found no evidence that patients developed necrotising arachnidism. No patients admitted to Christchurch Hospital required re-admission to treat sequelae of the putative spider bite. Support for a spider bite as the causative agent was not robust and alternative agents could have been the cause.

Conclusions The public's fear of bites from white-tailed spiders is likely misplaced and, if the spider was not caught in the act of biting the patient, alternative diagnoses should be considered before assuming a white-tailed spider was responsible for the patient's symptoms.

Australian white-tailed spiders (*Lampona cylindrata* (L. Koch) and *L. murina* (L. Koch)) are common throughout much of New Zealand and are often associated with human dwellings. *Lampona cylindrata* was first recorded in Nelson in 1913, while *L. murina* (Figure 1) has been known in the North Island for at least 100 years.¹ In their native Australia, *L. cylindrata* and *L. murina* are part of a complex of 57 species,¹ but in New Zealand these two species are the only representatives of their family (Lamponidae) and are distinct visually from other spiders that occur here. Note that the distinction between *L. cylindrata* and *L. murina* was not formalised until Platnick's taxonomic revision in 2000.¹ Consequently, literature prior to this typically refers to a single species, *L. cylindrata*.

Recently, considerable media attention in New Zealand has focused on the adverse effects attributed to bites of white-tailed spiders. New Zealand press headlines and statements, such as 'Fears of biting spider plague',² 'Spider suspect in death mystery',³ and 'Doctors believed the wound was caused by a white-tailed spider',⁴ have done much to foster public anxiety about these spiders. These accounts, and others⁵ warned of sequelae such as severe skin damage, pain, inflammation and loss of quality of life persisting for several months after alleged white-tailed spider bites. Reports from Australia have suggested that white-tailed spider bites have left their victims with headaches, liver problems, gastrointestinal complaints, and immune system disorders, and that patients are at risk of amputation following the development of gangrene.⁶ The term 'necrotising arachnidism' has been used to describe a range of symptoms, from the very general 'potential cutaneous reaction to

spider bite venom',⁷ to the more specific 'skin blistering, ulceration and necrosis after spider bite'.⁸

Figure 1. White-tailed spider, *Lampona murina* (scale bar intervals are 1 mm)

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Understandably there is considerable public concern in New Zealand surrounding the presence of white-tailed spiders. Questions regarding white-tailed spiders made up 22% of all spider inquiries to the Museum of New Zealand Te Papa Tongarewa web site, 15% of spider inquiries to Otago Museum, and 21% of spider inquiries to Auckland Museum and Landcare Research, Auckland (Phil Sirvid, unpublished data for 1995–1997). We examined the records of Christchurch Hospital for patients admitted with a diagnosis of 'contact with venomous spiders' to investigate whether the concern regarding white-tailed spider bites and the sequelae of the spider bites is reflected in admissions to a major regional hospital.

Methods

Patients with reported spider bites were identified from Christchurch Hospital records and their notes examined to investigate the sequelae of white-tailed spider bites and any concurrent medical conditions that may have contributed to the development of adverse reactions to the bites.

Results

Ten patients admitted to Christchurch Hospital between January 2001 and January 2003 were diagnosed with 'contact with venomous spiders'. We reviewed the medical records of nine patients; the records of one patient were unavailable. Patient ages ranged from 15 to 80 years with a mean of 37.6 years. Patients were admitted to the hospital for an average of 3.2 days.

No patient reported capturing or observing a white-tailed spider in the act of biting. Generally the wounds were attributed to white-tailed spiders because of their presence in the patient's environment. Typically the records stated 'thinks was bitten while getting into sleeping bag' or 'has killed several white-tailed spiders over the last few weeks'.

Four of the nine patients had asthma and another patient reported allergies to eggs and the influenza vaccine. Two other patients had multiple medical problems. Six patients had microbiological swabs taken. One patient's swab was negative; one grew group G *Streptococcus* and four grew *Staphylococcus aureus*.

Eight of the nine patients were treated with antibiotics while in hospital. The most commonly prescribed antibiotic was flucloxacillin (six patients), either alone or in combination with a second antibiotic. Other antibiotics used were amoxicillin, penicillin, amoxicillin/clavulanate or cephalexin. No patients required re-admission to the hospital to treat the sequelae of their putative spider bites.

Discussion

Given the media coverage devoted to alleged bite cases and the large number of inquiries to New Zealand museums and similar institutions, surprisingly few people were admitted to Christchurch Hospital with a diagnosis of spider bite. The evidence supporting the diagnosis of bites from white-tailed spiders as the cause of the patients' wounds in the nine patient histories we examined was extremely weak, as no patient reported observing a spider bite them.

The bacteria grown from skin cultures of the Christchurch Hospital patients were unremarkable. *Staphylococcus aureus* is a well-known, transient part of human skin flora, can survive indefinitely in the nostrils and is often one of the pathogens responsible for causing cellulitis.⁹ Group G streptococci are also often one of the constituents of the normal skin flora of humans and can produce necrotising soft-tissue infections in patients with underlying medical problems.¹⁰ These infections can require surgical debridement and treatment with antibiotics.¹⁰

Others have noted that the symptoms described in patients with a putative spider bite can be mistakenly diagnosed as necrotising arachnidism. Other diagnoses of the symptoms that should be excluded before diagnosing necrotising arachnidism include ecthyma, pyoderma gangrenosum, ecthyma gangrenosum, focal vasculitis, foreign body, herpes zoster, purpura fulminans and staphylococcal infections.^{7,11}

Despite the well-documented long-term presence¹²⁻¹⁴ and widespread distribution throughout New Zealand of white-tailed spiders, as well as their close contact with humans and their distinctive appearance, it is interesting to note that the first New Zealand account of verified white-tailed spider bites does not appear until 1980.¹⁵ A report on the medical impact of insects and arachnids for 1967-1976¹⁶ made no

mention of white-tailed spider bites other than to cite Sunde's paper.¹⁵ Accounts of white-tailed spider bites are also absent from earlier works discussing poisonous spiders.^{17,18}

Widespread public concern about white-tailed spiders in New Zealand appears to have started in 1991, when Denis Welch, political writer for the widely read *NZ Listener* was unable to produce his regular column because of an alleged white-tailed spider bite. Since then, there has been a dramatic surge in inquiries about the spider made to institutions such as museums (personal communication, RL Palma, 2003), reflected in the inquiry statistics cited earlier. The scarcity of reports before this date suggests the public perception of these spiders as dangerous may be misplaced.

Many of the case reports from Australia associating necrotising arachnidism with white-tailed spider bites have been drawn from similarly tenuous evidence and there has been considerable debate as to whether white-tailed spiders are responsible for necrotising arachnidism.^{11,19-23} Often it is only after problems develop that symptoms are attributed to white-tailed spiders. For example, a case history typical of many of the Australian reports was of an elderly gentleman who presented with painful swelling of his right leg. Three days earlier he had been gardening and noticed the onset of pain in the knee later that evening. He was diagnosed with right ileofemoral venous thrombosis in association with superficial spreading cellulitis. Despite treatment with antibiotics and heparin, the patient eventually required several skin grafts and was discharged after two and half months of hospital care. Partly based on a nurse's experience in Vietnam, the cause was attributed to a spider bite and it was speculated that the spider responsible was a white-tailed spider; all this despite no spider having been seen.²⁴

As well as the weakness of the evidence identifying white-tailed spiders as the cause of these necrotic wounds, there is also debate as to whether white-tailed spider venom is toxic to humans. The venom of white-tailed spiders had little effect on mouse skin in vivo and little effect on cultured mouse and human skin.²⁵ White-tailed spider venom has no sphingomyelinase activity, which is thought to be the enzyme responsible for many of the necrotic effects of the bites of the brown recluse spiders, *Loxosceles rufescens* (Dufour), of North America.²⁶

Microorganisms such as *Mycobacterium ulcerans* have also been proposed as a cause of the necrotic skin lesions following putative spider bites.^{20,27} However, *M. ulcerans* was discounted as a cause of necrotising arachnidism as the organism does not survive in and will not colonise the midgut of a spider. As *M. ulcerans* survives only briefly on exposed surfaces, inoculation would have to occur simultaneously with a spider bite for a person receiving a bite to be infected.²⁸ Additionally there is no correlation between areas in Australia where *M. ulcerans* is endemic and the areas from which necrotic arachnidism has been reported.²⁸ While not yet recorded in association with white-tailed spider bites, the fungal disease sporotrichosis has been documented with bites and stings of other terrestrial arthropods.²⁹

A review of 14 Australian cases of suspected white-tailed spider bites found that the spider was positively identified as a white-tailed spider in only three cases.³⁰ All three patients developed a red, erythematous, itchy rash that formed skin ulcers. In two of the patients the ulcers healed then broke down again and eventually healed.³⁰ The

other patient had multiple episodes of shallow lesions that healed but then recurred with a gradual decrease in frequency.³⁰

In nine more Australian cases where white-tailed spiders were positively identified as responsible, the bites were all described as painful or severely painful and the bites all occurred indoors.³¹ The severity of the pain experienced when bitten suggests to us that those patients who develop lesions overnight, without waking, as occurred with one patient admitted to Christchurch Hospital, are unlikely to have been bitten by a spider.

The practice of blaming spiders for idiopathic necrotic wounds is not restricted to Australia and New Zealand. In the United States, many necrotic wounds are attributed to brown recluse spiders, often despite no record of the presence of brown recluse spiders in the patient's environment.³² One factor that may pressure New Zealand physicians into attributing idiopathic wounds to white-tailed spiders is New Zealand's system of personal medical insurance, provided by the Accident Compensation Corporation (ACC). The ACC requires an external force to be identified before subsidising medical care and paying benefits to people unable to work. If an external force is not identified, the ACC will not cover the costs associated with the injury.

There were no reports of sequelae from the spider bites severe enough to require re-admission to Christchurch Hospital in the patient histories we examined. Five of the nine Christchurch Hospital patients had a previous history of allergy or asthma and two of the four patients without a history of allergy or asthma had multiple medical problems. It is possible that these concurrent medical conditions contributed to the symptoms experienced by the patients.

Given the weakness of the evidence associating white-tailed spiders with necrotic arachnidism we believe that much of the fear that surrounds these spiders is unwarranted. For example, more people were admitted to New Zealand hospitals as the result of fly bites between 1967 and 1976 than were admitted because of spider bites.¹⁶ We found no evidence that the patients admitted to Christchurch Hospital developed necrotising arachnidism.

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