
Original Contributions

“SPIDER BITE” LESIONS ARE USUALLY DIAGNOSED AS SKIN AND SOFT-TISSUE INFECTIONS

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□ **Abstract—Background:** Many people seek medical attention for skin lesions and other conditions they attribute to spider bites. Prior experience suggests that many of these lesions have alternate causes, especially infections with community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA). **Objectives:** This study determined the percentage of emergency department (ED) patients reporting a “spider bite” who received a clinical diagnosis of spider bite by their physician vs. other etiologies, and if the diagnoses correlated with demographic risk factors for developing CA-MRSA infections. **Methods:** ED patients who reported that their condition was caused by a “spider bite” were prospectively enrolled in an anonymous, voluntary survey regarding details of their illness and demographic information. Discharge diagnoses were also collected and categorized as: spider bite, bite from other animal (including unknown arthropod), infection, or other diagnosis. **Results:** There were 182 patients enrolled over 23 months. Seven patients (3.8%) were diagnosed with actual spider bites, 9 patients (4.9%) with bites from other animals, 156 patients (85.7%) with infections, and 6 patients (3.3%) were given other diagnoses. Four patients were given concurrent diagnoses in two categories, and 8 (4.4%) did not have the diagnosis recorded on the data collection instrument. No statistically significant associations were found between the patients’ diagnostic categories and the demographic risk factors for CA-MRSA assessed. **Conclusion:** ED patients reporting a “spider bite” were most frequently diagnosed with skin and soft-tissue infections. Clinically confirmed spider bites were rare, and were caused by black widow spiders when the species could be identified. © 2011 Elsevier Inc.

□ **Keywords—Spiders; bites and stings; methicillin-resistant *Staphylococcus aureus*; black widow spider; arachnidism**

INTRODUCTION

Many people seek medical attention for skin lesions and other conditions they attribute to spider bites. When carefully evaluated, most of these alleged “spider bites” are found to have alternate causes. For instance, spider and envenomation specialists Willis Gertsch and Findlay Russell reported that “of approximately 600 suspected spider bites seen by us, 80% were found to be caused by arthropods other than spiders or by other disease states” (1). Among 1384 patients with presumed spider bites or insect stings referred to a university clinic specializing in arthropod envenomations and parasitology, only 618 (44.7%) had arthropod-related conditions, whereas 612 (44.2%) had conditions caused by bacteria, viruses, or parasites, and 154 (11.1%) had conditions caused by chemical or physical agents (2). Many lesions ascribed to spider bites exhibit skin breakdown, or dermonecrosis. The list of diseases causing dermonecrotic wounds mistaken for spider bites is large, and includes various skin infections, primary dermatologic conditions, vasculitides, self-induced injury, and many other environmental exposures (1,3,4). However, because it is commonly known that spider bites may cause dermonecrosis, they are often blamed for skin lesions of unclear etiology

(3–7). The brown recluse spider (*Loxosceles reclusa*) is often specifically blamed, even in areas where such bites are epidemiologically improbable or impossible (3–11).

The widespread belief that spider bites commonly cause otherwise unexplained skin lesions has been challenged in editorials and review articles (3–7,10). Actual evidence either supporting or refuting this belief is sparse in the medical literature, although it is a common clinical scenario. When alleged “spider bites” are mentioned in systematic studies, it is typically among investigations of community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA) infections, where some subjects had blamed their lesions on spiders (12–15). This current study starts instead with all patients reporting “spider bites” and then tracks their medical diagnoses. The results of this study should guide emergency department (ED) clinicians evaluating patients presenting with a complaint of “spider bite.”

Although anecdotal evidence suggested that most patients with alleged “spider bites” had other causes for their lesions, no published data relevant to the ED setting could be found indicating how often this attribution was correct or incorrect. This study was intended primarily to determine what percentage of these patients had their complaint clinically confirmed by the ED physician, vs. those given alternate diagnoses. Because many patients with alleged “spider bites” have bacterial skin and soft-tissue infections (SSTI), the secondary goal was to determine if the diagnoses correlated with demographic risk factors for infection with CA-MRSA, the most frequent cause of SSTI in the study ED (16).

METHODS

The study was conducted in an academic, suburban ED with an annual census of 36,000–38,000 patients. Subjects were prospectively enrolled as they were identified with a complaint they spontaneously stated was, or may have been, caused by a “spider bite.” Subjects included patients whose chief complaint included attribution to a “spider bite,” or if the patient initiated the issue later during their evaluation. During the study, investigators reminded the ED staff to avoid suggesting to patients that their conditions might be related to “spider bites,” so that only patient-initiated complaints would lead to enrollment. Any member of the ED health care team could refer potential subjects to a research associate who would assist in enrollment and data collection. The research associates were present every day, except major holidays, from 8:00 a.m. until midnight.

Subjects were given a 12-question, multiple-choice, anonymous survey. If the subject was a minor, their parent or legal guardian completed the survey. Subjects

were asked to report the number of prior similar episodes, prior treatment, duration of current symptoms, why they believed their current condition was caused by a spider bite, whether they felt a bite or sting, whether they saw the spider, and what kind of spider they thought it was. Surveys were completed as early in the ED visit as possible, usually before physician evaluation, to avoid influencing survey responses.

With regard to risk factors for developing infections with CA-MRSA, subjects were asked their primary type of residence over the preceeding month (to characterize population density and hygiene access issues), whether they lived with someone who had been incarcerated within the last year, and any use of injectable or stimulant drugs within the preceeding month (12,13,15,17–20). Due to the large variety of primary residence types, these were divided into three categories for statistical analysis: homeless (including sleeping outdoors, or in a vehicle), communal (including dormitories, halfway houses, recovery homes, group homes, prison/jail, homeless shelters, and armories), or other (predominantly single-family detached homes, but also including apartments, condominiums, duplexes, hotel/motel, and mobile homes in fixed locations). The diagnosis documented by the treating physician on the patient’s chart at ED discharge was recorded by the research associates into the following four categories: spider bite, bites or stings from other animals (including unknown arthropods), infection, or other diagnoses.

The study documents were written in English only. Research associates were available to read the survey to subjects who could not read English, or who preferred to complete it in a verbal format. Subjects who could not understand spoken English were excluded. This study received Institutional Review Board approval and was exempted from requiring written informed consent. Subjects completing the survey were given a patient information sheet describing the epidemiology and clinical effects of actual spider bites (focusing on black widow and brown recluse spiders) and SSTIs caused by CA-MRSA.

The data were entered in an Excel spreadsheet (Microsoft Corporation, Redmond, WA) and analyzed using Stata (version 9.2, StataCorp, College Station, TX). In most cases, descriptive statistics were used. The chi-squared test was used to test independence of survey responses from the diagnostic category of infection as outcome. Due to the small number of subjects diagnosed with bites from spiders or other animals, contingency tables with a bite or sting diagnosis as the outcome were analyzed using Fisher’s exact test. *p*-Values < 0.05 were considered statistically significant.

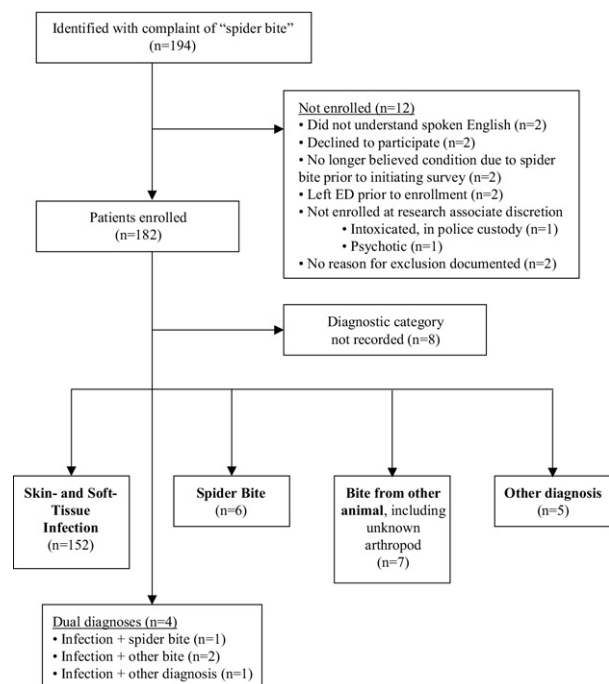


Figure 1. Patient flow diagram.

RESULTS

There were 194 potential subjects documented between January 2006 and November 2007. Figure 1 is a patient flow diagram showing the reasons for patient exclusion (n = 12) and the distribution of clinical diagnoses at ED discharge.

The great majority of patients were diagnosed with skin and soft-tissue infections; 152 of 182 patients enrolled (83.5%) were diagnosed with SSTI only. Four patients were given concurrent diagnoses in two categories, which included SSTI in each case. Thus, the total percentage of patients diagnosed with infections was 85.7% (156/182).

Seven patients (3.8%) had their complaint of spider bite clinically confirmed by their treating physicians; see Table 1 for further information regarding these cases. Nine patients (4.9%) were diagnosed with bites or stings from other animals, including unknown arthropods. Six patients (3.3%) were given other, non-bite, non-infectious diagnoses: erythema multiforme, soft-tissue swelling associated with recent ankle dislocation, subcutaneous nodules possibly related to metastatic lung cancer, urticaria, one dual-diagnosis patient with a razor cut and associated folliculitis, and one case where the alternate diagnosis was not recorded. Eight patients (4.4%) had no diagnostic category recorded on the data collection instrument.

Table 2 shows the distribution of responses to the survey questions related to spider bites. Totals in this table do not always equal 182 due to responses left blank, multiple responses accepted for some questions, or not all questions applicable to all subjects. Percentages listed in the table are of the total respondents for that question.

No statistically significant differences in the incidence of being diagnosed with infection were found between patients with or without the various risk factors for CA-MRSA assessed (Table 3). With regard to primary type of residence during the previous month, 11 subjects were categorized as homeless and another 24 as living in a communal setting, whereas the rest comprised the “other” category. A significant inverse association was observed between the subjects’ report of feeling a bite or sting and the incidence of being diagnosed with an infection; this would be expected, because the infections often ascribed to spider bites would not require any initiating traumatic event.

Several of the patient-reported, spider-related factors showed statistically significant associations with the clinical diagnosis of a spider bite (Table 4). A positive report of feeling a bite or sting, witnessing the spider bite event, or having seen the spider that caused the problem were all associated with increased likelihood of receiving a physician’s diagnosis of a spider bite. Notably, only half of the subjects who reported witnessing the actual spider bite had their claim confirmed by their evaluating physicians.

Table 1. Seven Patients with Clinically-Confirmed Spider Bites

Number	Type of Spider	Additional Information
3	Black widow spider	One patient brought offending spider to the ED, where it was confirmed to be a black widow. Indigenous black widow = <i>Latrodectus hesperus</i> , which is the presumed species in all three cases. Spiders did not receive expert identification by arachnologist.
2	“Black spider,” not otherwise specified	One of these patients who claimed to witness the bite was also diagnosed with infection.
2	Unknown species	One patient claimed to feel a bite, then killed a spider (not further described) in the immediate vicinity. One patient felt no bite, and no spider was witnessed in the vicinity; justification for the physician’s diagnosis of “spider bite” was not recorded.

Table 2. Responses to Survey Questions

	n	%
How many times have you had this type of medical problem before?		
Never	134	73.6%
1 time	33	18.1%
2 times	11	6.0%
3–5 times	3	1.6%
6–10 times	0	0.0%
> 10 times	1	0.5%
How was this problem treated in the past? (n = 43; multiple responses accepted)		
No treatment	15	34.9%
Oral antibiotics only	15	34.9%
Parenteral antibiotics, but not admitted	8	18.6%
Admitted for antibiotics	3	7.0%
Incision and drainage, not in operating room	10	23.3%
Incision and drainage, in operating room	5	11.6%
Antivenom	0	0.0%
How long have you had this current problem?		
Started today	20	11.0%
1–3 days	79	43.4%
4–7 days	61	33.5%
1–4 weeks	18	9.9%
> 1 month	3	1.6%
No response	1	0.5%
Did you feel a bite or sting?		
Yes	41	22.5%
No	125	68.7%
Not sure	16	8.9%
Did you see the spider that caused this problem?		
Yes, I saw it biting me	4	2.2%
Yes, I saw it around the time of the bite	13	7.1%
Yes, I've seen spiders where I live and one bit me	14	7.7%
No, but I'm sure a spider bit me	53	29.1%
No, but something definitely bit me	51	28.0%
No, and I'm not sure anything bit me	45	24.7%
Other	2	1.1%
How do you know this problem is due to a spider bite? (n = 181; multiple responses accepted)		
A friend/relative/acquaintance told me it was a spider bite	50	27.6%
Spider bites are generally known to cause this kind of problem	38	21.0%
Similar lesions on others were diagnosed as spider bites	25	13.8%
A similar prior lesion I had was diagnosed by doctor/nurse as a spider bite	18	9.9%
"Not sure", "Assumed", "Guessed", or equivalent responses	15	8.3%
Similar prior lesion I had was diagnosed by friend/relative as a spider bite	13	7.2%
I looked it up in a book, on the internet, or in some other reference	13	7.2%
A doctor or nurse told me it was a spider bite	11	6.1%
Other fill-in-the-blank response, not listed above	70	38.7%
What kind of spider do you think most likely caused this problem? (n = 182)		
Brown recluse spider*	36	19.8%
Black widow spider	25	13.7%
Hobo spider	2	1.1%
Daddy long-legs	2	1.1%
Other spider†	63	34.6%
Other bug‡	22	12.1%
"Not sure," "no idea," or "don't know"§	29	15.9%
No response	3	1.6%

* Includes one response of "either brown recluse or black widow."

† Includes house spider (n = 3), black spider, jumping spider, tarantula, tiny red/orange spider, wolf spider, and wood spider (1 each).

‡ Includes subject didn't know if spider or other bug (n = 2), flea (n = 2), ant, bee, mosquito, and "scorpion or grasshopper" (1 each).

§ No option offered above chosen; subject indicated uncertainty without specifying that a spider caused their condition.

DISCUSSION

Previous clinical experience suggested that many patients claiming a "spider bite" actually had bacterial skin or soft-tissue infection, often caused by CA-MRSA. One

of the current study's goals was to quantify how often this occurred, and ascertain whether a patient's complaint of "spider bite" could essentially be equated with a clinical diagnosis of SSTI. Almost 90% of patients (156/174) with a final ED diagnosis recorded were diag-

Table 3. Incidence of Patient being Diagnosed with Infection, by Survey Response

Survey Question/Issue Being Compared	Incidence of Infection, by Response		
	If “Yes”	If “No”	p-Value*
Do you live with anyone who has been in jail or prison within the last year?	92.1%	81.9%	0.128
Have you used any injected drugs within the last month?	90.0%	83.7%	0.598
Have you used any stimulant drugs within the last month?	80.0%	84.4%	0.653
Primary residence type in last month = “Communal” (vs. “Homeless” or “Other”)	87.5%	83.5%	0.622
Primary residence type in last month = “Homeless” or “Communal” (vs. “Other”)	88.6%	83.0%	0.418
Subject reported having had a prior “spider bite”	85.4%	83.6%	0.766
Subject reported feeling a bite or sting	65.9%	88.0%	0.001

* p-Value comparing the incidence of subjects diagnosed with infection between those responding “Yes” vs. “No” for the survey question in each row.

nosed with an infection. CA-MRSA is a common cause of SSTIs, accounting for nearly 70% of all positive wound cultures obtained in the study ED (16). Although this study did not involve wound culture results, it is likely that around two-thirds of the subjects reporting a “spider bite” had infection caused by CA-MRSA, making it the predominant diagnosis. The misattribution of lesions caused by CA-MRSA to “spider bites” seems to result from the frequent finding of central dermonecrosis, which is probably caused by bacterial production of Panton-Valentine leukocidin toxin (21,22).

The attribution of various skin lesions to “spider bites” is neither a local nor only a modern phenomenon. Over 100 years ago, Browning noted that:

Not infrequently a person discovers a local inflammation which cannot be accounted for in a satisfactory manner, and will say with the utmost confidence that it is a “spider bite,” when closer questioning will develop the fact that he does not know what caused the condition, but because it has the appearance of a sting or bite and it is not known what else it could have been, believes it to be a spider bite (23).

This statement remains as true today as when it was published in 1901. Virtually identical assessments regarding allegations of spider bites have been published just within the last several years, originating from as far away as Brazil and Australia (7,24,25). Thus, it cannot

simply be the emergence of CA-MRSA infections that is responsible for blaming spiders, but rather a deeper, ingrained societal attitude towards spiders and the myths surrounding them (7). The persistent misdiagnosis of unexplained lesions as spider bites is probably multifactorial in origin (21,26). Arachnophobia is common. Spiders may be especially feared due to their known predatory nature against insects, which is falsely assumed to extend towards humans as well. The human psyche seems to readily accept belief that unexplained signs and symptoms are caused by external forces, such as envenomation, rather than somatic illness or weakness. Health care professionals also contribute by failing to generate an adequate differential diagnosis, and coming to premature diagnostic closure. The primary purpose in diagnosing a “spider bite” seems to be simply to provide a tangible and remotely plausible label for an otherwise unexplained condition.

Related “Spider Bite” Studies

The attribution of skin lesions as spider bites that are caused specifically by CA-MRSA has been reported since 2002. One of the earliest reports came from Los Angeles correctional facilities, where inmates during an outbreak of suspected “spider bites” were found to have MRSA infections instead (12,17). A 2003–2004 outbreak of CA-MRSA “spider bites” in five American military barracks spurred investigation by a pest management consultant that revealed no arthropods of medical importance (19). In 2003, a series of 38 patients admitted for surgical debridement of “serious soft tissue infections secondary to spider bites” found that all were culture-positive for *S. aureus*, 86.8% of which were MRSA (27). This report is particularly troubling, as

Table 4. Incidence of Patient Being Diagnosed with a Spider Bite, by Survey Response

Survey Question/Issue Being Compared	Incidence of Spider Bite, by Response		
	If “Yes”	If “No”	p-Value*
Subject reported feeling a bite or sting	12.2%	1.6%	0.011
Subject reported witnessing a spider biting them	50.0%	2.8%	0.007
Subject reported seeing the specific spider that caused that caused their problem	12.9%	2.0%	0.017
Subject reported seeing a spider, but not the biting incident	7.4%	3.2%	0.278

* p-Value comparing the incidence of subjects diagnosed with infection between those responding “Yes” vs. “No” for the survey question in each row.

the authors barely acknowledged that the presumptive diagnoses could have been wrong, implying that the infections were secondary to actual spider bites. A retrospective review of 19 patients with CA-MRSA infections presenting to one Florida ED from 2002–2004 found that 9 (47%) reported a spider bite as their chief complaint (28).

Two recent studies of SSTIs among ED patients also show an association with alleged “spider bites.” Frazee et al. noted in a prospective observational study of 137 subjects that “many patients presenting with a furuncle caused by MRSA complain of a spider bite,” but provided no data to estimate incidence (13). Moran et al. collected data on 422 patients with purulent SSTIs at 11 EDs across the United States (15). They found that 29% (71/248) of patients infected with MRSA and 13% (17/135) of those infected with other bacteria had reported a spider bite. The patient’s complaint of a “spider bite” increased the likelihood of their lesion being caused by CA-MRSA vs. any other bacteria almost threefold (odds ratio 2.8; 95% confidence interval [CI] 1.5–5.3) (15).

One theory for associating spider bites with skin infections is the introduction of bacteria during the bite. A study of bacteria carried by 100 common house spider specimens found very low numbers of microbial flora, only one isolate with pathogenic potential in humans (*Aeromonas*), and no instances of *S. aureus* or MRSA (29). Bacteria that are pathogenic to humans may not thrive on spiders, whose bodies are at ambient temperature. An even more likely explanation, however, is that bacterial SSTIs and alleged “spider bites” are associated only by reputation, and no causal link exists.

Only a few studies have focused on patients evaluated specifically due to a presumed spider bite, and none are generally applicable to the ED. Cacy and Mold prospectively collected data regarding 149 patients evaluated by Oklahoma family physicians for brown recluse spider bites. Eleven percent of the cases were rated in retrospect as “not a recluse bite,” and 66% of the patients were treated with antibiotics, suggesting that an infectious etiology was suspected (30). Wright et al. reported a retrospective series of 111 patients in Tennessee seen either in a toxicology clinic or the ED for presumed brown recluse spider bites. Eighty-six percent were treated with antibiotics, and the authors noted that “[i]t is virtually certain that some patients in our series had lesions that were the result of some other cause” (31). Because both of these studies were conducted where the brown recluse spider is endemic, the incidence of actual spider bites resulting in dermonecrotic wounds is expected to be much higher than in the current study. Russell and Gertsch reported that 80% of approximately 600 suspected spider bites were found to have an alter-

nate cause, whereas 44.7% of 1348 patients evaluated for presumed spider bite or insect sting over 40 years in a Chilean university specialty clinic had a condition originating from an arthropod (1,2). The Chilean study reported a 16.6% incidence of loxoscelism (*Loxosceles laeta* is endemic to the area) and an additional 1.3% of patients affected by other spiders.

Some well-performed studies of patients with definite spider bites originate from Australia. Isbister and Gray prospectively evaluated 750 spider bite patients who immediately collected the offending animals, which were then expertly identified by an arachnologist, and the subjects were followed clinically (32). None of the subjects developed necrotic ulcers (99% CI 0–0.7%). Similarly to how Americans often blame unexplained dermonecrotic wounds on brown recluse spiders, the spider typically blamed in Australia is the white-tail spider (*Lampona cylindrata* or *L. murina*). In a series of 130 definite white-tail spider bites, no necrotic ulcers occurred (97.5% CI 0–2.8%) (33). These studies demonstrate that spider bites are a very rare cause of dermonecrotic lesions, at least in Australia, and probably anywhere outside of *Loxosceles* spider-endemic areas.

What Does “Spider Bite” Mean?

The data from this study show that “spider bite” is a commonplace, short-hand term used to describe skin lesions of indeterminate etiology, particularly when dermonecrosis is present. All of the subjects initially blamed their conditions on spider bites, but the information that might justify their claims was often weak or altogether absent. Most patients did not feel a bite or sting and did not see any spider. Among those claiming to have seen a spider, witnessing the actual biting incident was very rare, and even that claim did not always result in a physician’s diagnosis of a spider bite. When asked why they thought their conditions were from spider bites, the most common responses were the medical equivalent of hearsay. Of particular concern to health care professionals were the 16% of responses indicating that the current or prior similar lesion was diagnosed as a spider bite by a doctor or nurse. Thus, the label of “spider bite” seems to be common among laypersons and health care personnel alike.

Responses regarding what kind of spiders the subjects thought had bitten them further indicate that “spider bite” is a generic term that doesn’t specifically implicate arachnids. When offered a choice of four spider species and an additional “other spider” category (Table 2), more than 25% of subjects indicated instead that they had been bitten by an “other bug” or that they did not know if it

had been a spider. These subjects were apparently not convinced that they had been bitten by spiders, but identified their medical complaint as a "spider bite" presumed for lack of better terminology.

Thus, "spider bite" is a *dysphemism*, the opposite of a *euphemism*, used when standard vocabulary cannot adequately describe the patient's medical complaint. Whereas euphemisms are expressions that are more agreeable or less offensive than what they replace, a dysphemism (or cacophemism) is a nastier substitute. Blaming a spider places a disagreeable yet widely understood label to the condition. From a medical perspective, however, most of the conditions called "spider bites" would properly be called "dermonecrotic wounds of uncertain etiology" (6).

Limitations

This study was conducted in a single ED, and the results may not be applicable in all geographic or clinical settings. The study ED is located within the known geographic range of a black widow spider species (*Latrodectus hesperus*), but is approximately 1400 km outside the range of the brown recluse spider (*Loxosceles reclusa*) (3). Particularly in areas where the brown recluse is endemic, the incidence of clinically confirmed spider bites could easily be higher. Even in such areas, however, the misattribution of dermonecrotic wounds to spider bites is common (30,31). Similarly, the incidence of black widow spider bites could be geographically dependent.

We relied on subject reporting, without requiring any outside confirmation of the information provided. The ED clinical diagnosis is also not a criterion standard; it is quite possible that some patients' diagnostic categories were misassigned. The ED diagnoses could have been biased, because physicians were not blinded to the subjects' clinical histories. We elected to use the ED clinical diagnosis rather than require wound cultures or other confirmatory testing, because this would better reflect ED working conditions, where empiric treatment is typical. Also, this study was unfunded, and we wanted to avoid incurring additional costs to the subjects that were not directly related to their medical care.

Diagnostic uncertainty may also have influenced the results. Eight subjects had no final diagnostic category recorded on the data collection instruments. It is likely that most of these patients had infections. If all eight had infections, the percentage of ED patients claiming a "spider bite" ultimately diagnosed with SSTI would be 90.1% (164/182). Conversely, if all eight had been bitten by spiders (rather unlikely), this would increase the percentage of clinically confirmed spider bites to 8.2%

(15/182), which is still a small minority of cases. Some of the 9 patients diagnosed with bites or stings from other animals (which included unknown arthropods) may have been bitten by spiders, but there was insufficient clinical evidence for the physician to ascribe it specifically to a spider. In any event, the great preponderance of patients presenting with a complaint of "spider bite" were diagnosed with SSTIs, and very few were diagnosed with actual bites, whether from spiders or from other arthropods.

Seven patients had their claims of spider bites clinically confirmed by their treating physicians. In retrospect, two of these cases appear highly suspicious for physician misdiagnosis: the patient who reported feeling no bite and where no spider was recovered, and the patient who was diagnosed concurrently with an infection (Table 1). It is not clear how the physician in the former case made this diagnosis. Generally, physician-confirmed spider bites involve a reliable eyewitness account of the incident, recovery of the offending spider, or the patient developing typical signs and symptoms of envenomation. None of these conditions were recorded for this patient, although the data collection instrument did not require the physician to document justification of their diagnosis. In the second case, a concurrent diagnosis of infection increases suspicion that the eyewitness history of a bite by a "black spider" might have been fabricated by the patient. Actual spider bites should not significantly increase the risk of developing SSTIs above baseline, because the amount of physical trauma involved is (barring a few very large species not relevant to this study) negligible compared to the cumulative minor skin abrasions, nicks, and scratches humans endure daily. Concurrent infection of actual spider bites is very rare, increasing the likelihood that this dual diagnosis was incorrect (32,34).

Three patients were diagnosed with black widow spider bites, and these were the only cases where a specific species was implicated. No analytical proof of widow spider envenomation (i.e., determination of circulating venom levels) was obtained; these cases were diagnosed based on signs and symptoms consistent with latrodectism or compatible clinical histories. In one case the purported offending black widow spider was brought to the ED, but even this specimen was not subjected to expert identification. Nevertheless, when compared to the 36 subjects alleging a brown recluse bite occurring far outside that spider's known geographic range, these three black widow bites were at least epidemiologically viable. Widow spider envenomation also produces a distinct toxidrome that is less likely to be confused with potential mimics, compared to the myriad causes of dermonecrotic wounds, making these three cases more likely to be true-positive spider bites.

The lack of any significant association between the risk factors for CA-MRSA and the incidence of a diagnosis of infection probably results from this study being underpowered to detect such associations. The incidence of infection was very high whether these factors were present or not, and many more subjects would be required to potentially obtain statistically significant results in this regard.

CONCLUSION

Patients ascribe a large variety of medical conditions to spider bites. The most common clinical diagnosis reached by ED physicians evaluating patients with a complaint of "spider bite" in this study was a skin or soft-tissue infection. Many of these infections were believed to have been caused by CA-MRSA. Part of the reason for the misattribution of these skin infections to spider bites probably results from the appearance of the typical lesion induced by CA-MRSA, which is an erythematous, indurated area with central dermonecrosis. Whether warranted or not, dermonecrosis is commonly associated by laypersons and health care personnel alike with spider bites, and thus the lesion is blamed on a spider, even in the absence of corroborating historical data.

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ARTICLE SUMMARY

1. Why is this topic important?

Many people seek medical attention for skin lesions and other conditions they attribute to spider bites. Prior experience suggests that many of these lesions have alternate causes, especially infections with community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA).

2. What does this study attempt to show?

This study determined the percentage of emergency department (ED) patients reporting a "spider bite" who received a clinical diagnosis of spider bite by their physician vs. other etiologies, and if the diagnoses correlated with demographic risk factors for developing CA-MRSA infections.

3. What are the key findings?

Out of 182 patients, 7 (3.8%) were diagnosed with actual spider bites, 9 (4.9%) with bites from other animals, 156 (85.7%) with infections, and 6 (3.3%) were given other diagnoses. No statistically significant associations were found between the patients' diagnostic categories and the demographic risk factors for CA-MRSA assessed.

4. How is patient care impacted?

ED patients reporting a "spider bite" were most frequently diagnosed with skin and soft-tissue-infections, many of which were believed to have been caused by CA-MRSA. Clinically confirmed spider bites were rare, and were caused by black widow spiders when the species could be identified.