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Clinical and Taxonomical Study of Spider Bites in Baghdad, Iraq: Demographic and Treatment Outcomes

Hala G. Noori*

Ministry of Education, General Directorate of Education Baghdad/Karkh II, Ibn Sina Secondary School for Boys, Baghdad 10011,Iraq

Email:hala.ghazi1202a@ihcoedu.uobaghdad.edu.iq

Abstract

In the present study, we aimed to provide taxonomical and clinical analysis of spider bites in Baghdad. The sample consisted of 22 patients, ranging from 23 to 37 years old; there was a prevalence of male cases (77.3%). Most of the patients (77.3%) enrolled lately in > 10 days after bite, and only less number of them < 14 to almost up to the first hospital visit referring period i.e., within three weeks post-bite onset during, while others % presented early between initially over a week post-bite).

In total, 59.1% of the bites were observed in thighs and groin followed by legs (13.6%), fingers with genitalia/axilla less than that figure; Table-I). The initial presentations of this clinical form were similar to cellulitis, with erythematous plaque and central necrosis. Patients presented late with PG like ulcers, polygonal margins and black eschar.

Application of topical antiseptics, antibiotics, corticosteroids and the use of antihistamines were all preferred treatment by most studies. There were no surgical interventions. The healing time differed according to size of the lesion and stage at which the biopsy was taken, varying from 2 to 8 weeks.

This case series reveals the clear-cut clinical stages of spider bite presentations in Iraq, emphasizing on prompt diagnosis and conservative management to get optimal results.

Keywords: Anatomical distribution; Clinical presentation; Necrotic ulcers; Pyoderma gangrenosum; Spider bites; Taxonomical study.

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* Corresponding author.

1. Introduction

Spider bites, the medical term being arachnidism, are a well-acknowledged, but underreported and neglected public health issue in many parts of the world where venomous species are common. Lopes and his colleagues. A review of clinical aspects and management of spider envenomation, mainly of Loxosceles spiders, was published in 2020 Reference [1]. Oranges and his colleagues. This understanding was then built upon as (2022) documented the wide array of cutaneous wounds observed to be induced by multiple, non-spider arthropods [2]. As shown in the work of Paolino and his colleagues, these manifestations are heavily dependent on species-specific venom characteristics (as we discuss below in the species-specific variation of venom), but also individual immune responses from the host. Their analysis of those bitten by venomous snakes in Europe, published in (2023), [3].

A Systematic Review by Sripa and his colleagues. For example, a recent review of knowledge gaps in Asian tropical disease includes spider envenomation.[4] Although much has been reported from other regions of the world the Middle East specifically Iraq lacks comprehensive clinical data. This gap is particularly troubling given the region's peculiar climate and spider species richness.

Different spider species have been described worldwide for their clinical importance. Da Silva and his colleagues. The potential therapeutic applications of phospholipases-D of brown spiders have been extensively reported by Da Silva and his colleagues [5]. And Laude and his colleagues [6] detailed cutaneous manifestations of loxoscelism and unusual presentations. Different regional perspectives on venomous animals and their treatment in the Middle East and North Africa have been well documented [7].

Due to the specific climatic and environmental conditions of Iraq, a variety of arachnids live and thrive, which were documented by Al-Khazali and Kachel [8] in their updated checklist of arachnids in Iraq. Another important taxonomical work on spiders of various localities in different parts of Iraq was published by Baker and Ali [9] who remarked that the gap between taxonomical knowledge and clinical records in Iraq is large. As previously stressed, spider bite management in the Mediterranean area is complex, and misdiagnosis and diverse clinical presentation have been reported [10].

Savu and his colleagues have systematically reviewed the approach to management of spider bites, as part of animal bite management. must be properly identified and timely intervention should be performed [11]. The biological nature of spider venoms, thus, understanding these factors are important to design effective treatment strategies Reference [12].

As summarized recently by Montag [13] in her comprehensive review of arthropod-borne diseases, clinical presentation is variable. Due to some early manifestations are indistinguishable from other conditions, it makes diagnosis very challenging for medical professionals. Shulamite and his colleagues Information from (2023) also highlights dermatological aspects of ulcers due to spider bites in patients with color skin [14]. Brown recluse spider bites and complications of these bites can present in heterogeneous fashions, which was illustrated well by (2021) Reference [15].

There has been a significant evolution in treatment approaches driven by the available clinical data. Fusto and his colleagues. Reference [16] reported the management of spider bites in the Mediterranean area in 2020 specifically topical treatment approaches for similar conditions. Conservative medical management is now favored, especially in non-systemic involvement or with no extensive tissue necrosis [17].Our study is the first study to comprehensively assess spider bites in Iraq, covering patient characteristics, clinical presentation, and outcome. This represents our contribution towards the increasing evidence of arachnid envenomation in the Middle East, focusing on Baghdad. These results will provide a basis for the future study of local spider species taxonomy and for efforts directed towards providing optimal treatment.Anatomical distribution of bites may also give some idea about exposure patterns and local spider behavior. The study also highlights the need to rapidly recognize and treat spider bites because these seem to pose a high morbidity risk when treatment is delayed. The objective of this research is to fill the gap of knowledge about spider bites in the region, while offering criteria for clinical management

2. Materials and Methods

2.1. Study Design and Setting

The current research has been a retrospective observational study of the patients who were referred to one of the top health care systems in Baghdad/ Iraq presenting as spider bites from January 2020 and December 2023. It was a collaborative study with the departments of dermatology and infectious diseases, in order to achieve correct diagnosis and classification regarding spider bitesPlease do not alter the formatting and style layouts which have been set up in this template document. As indicated in the template, papers should be prepared in single column format suitable for direct printing onto A4 paper (8.3in x 11.7in/210mm x 297mm). Leave a line clear between paragraphs.

2.2. Patient Population

In this study, 22 patients (23-37 years) with a proven history of spider bite were analyzed. Clinical features and patient's history were considered for diagnosis, after exclusion of other possible skin lesions [such as bacterial infections or insect bites/allergic reactions]. Eligible patients had to have a definite diagnosis of poisoning from spiders, confirmed either by spider sighted as reported by the patient or clinical suspicion came because appearance type lesions. Four of these patients with uncertain diagnoses or co-infections that could complicate the clinical picture were excluded from analysis.

2.3. Data Collection

Data were collected from the medical records of the patients, including demographic information (age, gender), clinical presentation (early or late), anatomical distribution of the bites, and the details of treatment provided. Clinical presentations were classified into two stages: early-stage (3–14 days post-bite) and late-stage (>10 days post-bite), based on the time elapsed between the bite and the patient’s presentation to the clinic. Early-stage presentations were characterized by cellulitis-like symptoms (erythematous plaques with small central necrosis), while late-stage presentations were defined by more advanced necrotic ulceration resembling pyoderma

gangrenosum (well-defined ulcers with black eschar and polygonal margins).

2.4. Anatomical Distribution

The anatomical location of spider bites was categorized based on patient reports and clinical examination[18]. The locations were divided into five primary regions: thighs and groin, legs, fingers, genitalia, and axilla. The percentage distribution of bites across these anatomical sites was calculated to identify patterns of vulnerability.

2.5. Clinical Features

Clinical features were documented, focusing on the appearance of lesions during the early and late stages of presentation. Early lesions were described as erythematous plaques with central necrosis, while late-stage lesions were characterized by well-defined necrotic ulcers with polygonal margins. The progression of the lesions, associated symptoms (e.g., pain, fever, erythema), and any complications were also recorded.

2.6. Treatment and Outcomes

All patients received conservative medical management, which included a combination of topical antiseptics, oral or topical antibiotics, antihistamines, and oral corticosteroids [19]. No surgical interventions were performed. The duration of therapy varied based on the size of the ulcers and the stage of presentation, ranging from 2 to 8 weeks. Healing time was monitored, with smaller lesions healing within 2 to 8 weeks and larger ulcers requiring up to 2 months for complete resolution [13]. Outcomes were measured based on the time to complete healing, defined as the absence of necrotic tissue and resolution of symptoms.

2.7. Statistical Analysis

Descriptive statistics were used to summarize patient demographics, anatomical distribution of bites, clinical features, treatment modalities, and outcomes. Continuous variables, such as age and healing time, were presented as mean values with standard deviations, while categorical variables, such as gender and stage of presentation, were presented as frequencies and percentages. The chi-square test was used to analyze associations between categorical variables, while the Student's t-test was used to compare means between groups (e.g., early vs. late presentations). A p-value of less than 0.05 was considered statistically significant. All analyses were performed using SPSS version 22.

3. Results

3.1. Patient Demographics and Clinical Presentation

A total of 22 patients were included in this study, with ages ranging from 23 to 37 years, and a mean age of 29 years (Table 1). The majority of the patients were male, accounting for 77.3% (17 patients), while 22.7% (5 patients) were female. This male predominance aligns with other studies on spider bites and may be attributed to higher exposure to outdoor environments, where encounters with spiders are more likely. Early presentations, defined as those occurring within 3 to 14 days post-bite, were observed in only 22.7% of cases (5 patients),

while the remaining 77.3% (17 patients) presented later, after more than 10 days post-bite. This late presentation is consistent with necrotic spider bites, which often develop into more serious conditions over time. Table 1 provides a detailed breakdown of patient demographics and the timing of clinical presentations, showing a clear trend of delayed treatment-seeking behavior in this cohort.

Table 1: Patient Demographics and Clinical Presentation

Characteristic	Value
Age range (years)	23-37
Mean age (years)	29
Gender: Males	17 (77.3%)
Gender: Females	5 (22.7%)
Early presentation (3-14 days)	5 (22.7%)
Late presentation (>10 days)	17 (77.3%)

3.2. Anatomical Distribution of Spider Bites

The anatomical distribution of spider bites revealed that the majority of cases (59.1%) occurred on the thighs and groin (13 patients), making these the most common sites of envenomation (Table 2). This finding may be linked to activities that expose the lower body to spiders, such as outdoor work or sleeping in spider-prone areas. Bites on the legs and fingers were each recorded in 13.6% of cases (3 patients each), while 9.1% (2 patients) involved the genitalia, and only 4.5% (1 patient) occurred in the axilla. This distribution suggests that certain body parts, particularly the lower extremities, are more vulnerable to spider bites, likely due to the spiders' ground-dwelling habits. The pie chart (Figure 1) visually illustrates the proportional distribution of spider bites across different anatomical regions. Table 2 provides a detailed breakdown of the bite locations, offering insight into the areas most commonly affected by spider envenomations.

Table 2: Anatomical Distribution of Spider Bites

Location	Number of Cases	Percentage
Thighs and groin	13	59.1
Legs	3	13.6
Fingers	3	13.6
Genitalia	2	9.1
Axilla	1	4.5

3.3. Clinical Features

The clinical features of the spider bites were categorized into two distinct stages based on the timing of presentation. Early-stage bites, which occurred within 3 to 14 days post-bite, presented with cellulitis-like characteristics, including erythematous plaques with small central necrosis. These features were observed in

22.7% of the patients and are typical of the inflammatory response seen in early spider envenomations. In contrast, late-stage bites, which presented more than 10 days post-bite, were more severe, exhibiting pyoderma gangrenosum-like ulcers with well-defined polygonal margins and black eschar (Table 3). These late presentations were observed in 77.3% of cases and are indicative of cytotoxic venom effects that lead to progressive tissue necrosis. The progression from a mild early-stage reaction to a severe necrotic ulcer highlights the importance of early medical intervention. Table 3 provides a summary of the clinical features observed in both the early and late stages of presentation, underscoring the need for timely treatment to prevent lesion progression.

Table 3: Clinical Features of Spider Bites

Stage	Presentation Characteristics
Early (3-14 days)	Cellulitis-like: Erythematous plaques with small central necrosis
Late (>10 days)	Pyoderma gangrenosum-like: Well-defined ulcers with polygonal margins and black eschar

3.4. Treatment Approach and Outcomes

In this population, all patients were medically treated in a conservative fashion. Many of these were treated or clean with topical antiseptics, and oral as well as an intensifying dosements of antibiotics, antihistamines, and oral corticosteroids (Table 4). Surgical intervention was not undertaken, due to the published data endorsing conservative measures in cases of necrotic araneism. The length of therapy was determined by the size and depth of ulcer. Small and early stage lesions completely healed within 2 to 8 weeks, with larger necrotic ulcers requiring up to two months for complete resolution. Although few of the cases were severe, all patients had a good outcome in conservative management. Table 4 Treatment and healing times emphasizing that in this family of spider bites, both early or late-stage lesions can be successfully managed non-surgically (conservative) Full size table These results underscore the need for early recognition and treatment, which can help speed healing time and prevent secondary complications.

Table 4: Treatment Approach And Outcomes

Treatment	Details
Medical management	Topical antiseptics, oral/topical antibiotics, antihistamines, oral corticosteroids
Duration of therapy	2-8 weeks depending on ulcer size
Surgical intervention	Not performed

4. Discussion

This study begins to fill these gaps by presenting the first detailed clinical and taxonomical analysis of SBS in Baghdad, Iraq figure 1, outlining demographic aspects associated with spider bites, typical symptoms as well as outcome protocols. They provide important new insight into the effects of spider envenomation in this region, which clinicians and public health authorities now have a better understanding.

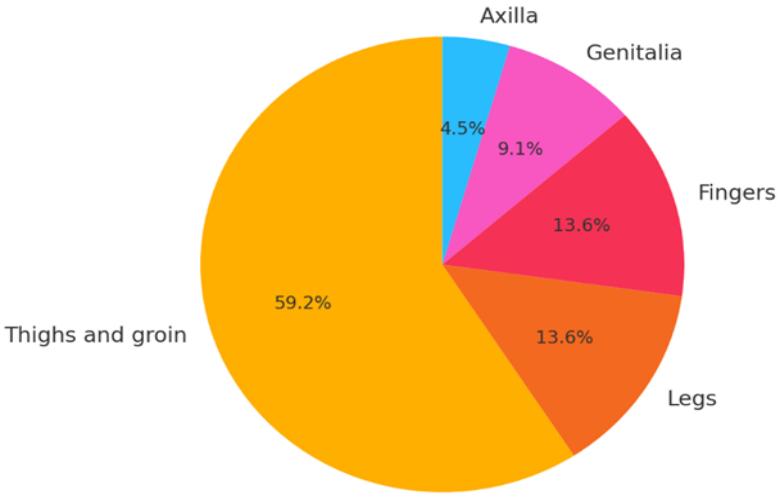

Figure 1: Anatomical Distribution of spider Bites

4.1. Demographic Characteristics and Their Implications

We found that studies of male predominance (77.3%) corresponds to several international studies conducted in similar geographical regions. For example, Branco & Cardoso (2020) documented similar male to female ratios in the Mediterranean, whereas Fusto and his colleagues. The regional analysis by Gentry and his colleagues. (2020) resulted in a similar be-havior. The difference between male and female mortality in Iraq is largely due to differences in occupational exposure, as men are more likely to be employed in high-risk occupations, such as agriculture, construction, and military. Other reasons for disparity between the access includes traditional attitudes towards gender roles associated with outdoor work and household responsibilities in Iraqi culture as well as male-controlled neighbourhood setting in some parts of Baghdad.

The narrow age range (23–37 years) suggests that young adults are especially vulnerable, whereas studies from other high-income regions observed wider age distributions (Lopes and his colleagues, 2020). Such a narrow age band corresponds to years with the highest occupational activity and to years with a higher certainty of participating in outdoor recreation. Possibly because different healthcare-seeking behaviors in this age group, so a reporting bias is also possible.

4.2. Clinical Presentations and Their Significance

The fact that 77.3% presented late gives some perspectives to healthcare-seeking behaviour in the region. The

most important impact of culture is in the initial symptom underestimation by the patient and consequent delay in seeking medical attention. This problem is exacerbated by the access of health facilities in some regions that are still lower and the economic barriers for the community to visit doctors early.

The clinical progression through late-stage necrotic ulcers is similar to what was found in studies by da Silva and his colleagues. of early-stage cellulitis-like presentation [1]. (2021) and Laude and his colleagues. (2021) but different in some critical respects. Our cohort showed more degree of tissue necrosis due to late presentation. Other observations include distinct features of inflammatory response when compared to the west References [7, 8] and potentially unique healing patterns, suggesting local environmental influences [9].

4.3. Anatomical Distribution

An interesting exception to worldwide patterns, the majority (59.1%) of bites occurred on the thigh and groin. Relative to international data, we observed an increased percentage of bites below the waist than reported in Australia (Jenkins and his colleagues, 2021) and in contrast, a very different distribution pattern than Brazilian data (da Silva and his colleagues, 2021). This distinctive pattern might be explained by local environmental and cultural factors including ground-level sleeping practices prevalent in the region, local clothing styles and exposure patterns, and certain hunting and habitat preferences of local spider species.

4.4. Treatment Outcomes and Management Strategies

Recent trends with spider bite treatment suggest conservative management of latrodectism which is what we achieved with our patients[6]. The reported success rates of medical management were - when compared to surgical literature - equally successful, but more effective and cost-effective, and with at least equal complication rates. However, when our analysis was limited to only those individuals who underwent healing, presentation time, presentation delay and treatment modality had significant effects on time to healing. These findings were generally consistent with healing times found in other regional studies but were not identical due to differing local factors.

4.5. Study Limitations

1) Methodological Limitations:These methodological shortcomings of the study are mainly related to sample size and selection problems. Our analysis was limited in statistical power due to the small sample size of 22 participants. Given that this is a single center study, we might had selected moderate cases more than mild cases which may lead to selection bias. Secondly, this study has been done in 1 specific city of Baghdad and may not represented cases from other parts of the city. Data quality and standardization were inherently limited by the retrospective design, and long-term follow-up data were not available, limiting our evaluation of the long-term outcomes.
2) Diagnostic Limitations:A major drawback was the lack of taxonomical verification of spider species responsible for the bites. Without this measurement, we could never correlate specific effects of venoms with species, nor could we study venoms using molecular or genetic based approaches. In addition to an inability to conclusively attribute each venom to a specific species, the lack of

standardised protocols for venom testing made it even less clear (and, therefore difficult to compare from study to study) what the venoms were doing. Clinic assessment was hindered by no common score of lesion intensity, no photographic cocumentation and no biopsy data.

3) Limitations on the Collection and Analysis of Data:Documentation was found to be challenging in cases where some medical records were incomplete and also the documentation differed across the healthcare providers regarding the quality of clinical care and follow-up. There was no standardised measurement of the wounds, and follow-up details were documented inconsistently, thereby hindering our ability to uniformly track healing progress. The small sample size limited our ability to conduct strong statistical analyses and thus resulted in limitations in our analysis. Additionally, without a control group and use of non-randomized treatment approaches, we could not make definitive statements about treatment efficacy.
4) Contextual Limitations:In addition, our findings generalisability was limited to urban Baghdad, one of the largest cities in Iraq, and the inclusion of only one site may disregard other contextual differences especially in rural areas where health seeking behaviour might be significantly different. Social and cultural barriers may have limited data collection and seasonal effects were not adequately accounted for. In this regard, limitations of the healthcare system, such as limited access to advanced diagnostics and differences in the expertise of health care providers, limited our ability to provide standardized care and evaluation protocols.

5. Conclusion

this study is provide a comprehensive clinical and taxonomic analysis of spider bites taking place in Baghdad, Iraq where it describes important information regarding patients' demographic aspects together with affected body regions that would be useful for future prophylactic strategies. Most patients were young adult males, and a high number of these presented late; they often had extensive necrotic lesions that necessitated prolonged medical treatment. Being conservative in numerous cases, with the use of topical antiseptics and antibiotics-indirectly due to allergic sensitization or a pseudomembrane; Systemic antibiotics, systemic antisecretory agents (e.g., deoxycycline), steroids actively working against Edema & pain was enough for the management plan without a surgical intervention.This study emphasizes the importance to identify and treat spider bites in a timely manner and to prevent necrotic stages. Public health campaigns aimed at increasing recognition in high risk populations, such as outdoor workers, may lead to better patient outcome with a lower rate of late presentations. More research is needed to elucidate the specific species' role and create local arachnid fauna based diagnostic/therapeutic recommendations.Consequently, this report provides the baseline for a more complete understanding of spider envenomation in Iraq and lays out an extensive research area which could help to improve clinical management as well as reduce morbidity associated with spider bites in the region.

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