ORIGINAL RESEARCH

Update on the Epidemiology of Scorpion Envenomation in the South of Tunisia

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Introduction—Scorpion envenomation is still a frequent occurance in tropical and subtropical regions. In Tunisia, multiple studies on scorpion envenoming have contributed to an improved understanding of cardiac dysfunction and factors predictive of poor prognosis. These previous studies have contributed to the current standardized management of envenomed patients. However, the epidemiology of scorpion envenoming in Tunisia has not been updated for more than 10 years. The aim of this study was to report an update of the epidemiological features of scorpion envenomation in the southern region of Tunisia.

Methods—This is a retrospective monocentric study including all patients admitted in the emergency room for scorpion envenomation. Cases were collected from emergency medical files during a 3-year period (2013–2015). The diagnosis of scorpion envenomation was made by history of a scorpion sting. All files in which scorpion envenomation was not certain were excluded. Data are presented as mean ± SD with range or percentages, as appropriate.

Results—We enrolled 282 patients aged 27.4 ± 22.8 years with a 1:1 sex ratio. During surveillance in the emergency room, 39 patients developed cardiac dysfunction. Overall, 42 patients (14.9%) were at stage 3 of severity, and 240 patients (85.1%) had moderate scorpion envenomation (stage 2). Only 1 patient died a few hours after admission. In the remaining cases, the outcome was good. Our results show the improvement in mortality rates even in severe presentations.

Conclusion—This study found that the outcome of scorpion-stung patients has clearly improved. This enhancement can be explained by early medical consultation and standardized management of patients with predictive factors for cardiac dysfunction.

Keywords: clinical features, management, prognosis, emergency department

Introduction

Scorpion stings are still a common pathology in North Africa and many other tropical or subtropical regions around the world.[1–4] Severe forms are mainly characterized by cardiopulmonary complications, such as pulmonary edema and/or cardiogenic shock.[1,5,6] In Tunisia, a large number of clinical and experimental studies, realized over the last decades, have found explanations for poor prognosis of stung patients.[1,7–12] Thanks to this research, the management of severe cases has become more homogeneous and various therapies have been well debated in literature.[13–17] Unfortunately, there are no recent studies substantiating the changes in the clinical and epidemiological features in our region. For this reason, we conducted this study to update the epidemiological characteristics of scorpion-envenomed patients admitted in the academic emergency department (ED) of our region.

Methods

CLINICAL SETTING

This is a retrospective study conducted over a period of 3 years (from January 1, 2013 to December 31, 2015). The study population consisted of consecutive patients admitted in the emergency room (ER) of the ED of Habib

Bourguiba University Hospital, in Sfax, for scorpion envenomation. This hospital is a unique surgical academic facility in the south of Tunisia. Patients with life-threatening pathologies or requiring continuous monitoring are admitted in the ER, a 10-bed unit where monitors and invasive therapies (mechanical ventilation, vasoactive therapies) are available. Patients with no disturbance in vital signs are managed in the nonvital area of the ED.

INCLUSION CRITERIA

All patients admitted in the ER for scorpion envenomation (stage 2 or 3)[2,18] were included. Cases without any systemic manifestations (stage 1) were excluded. The diagnosis of scorpion envenomation was made by a history of scorpion sting. If scorpion envenomation was not certain, the case was excluded.

PATIENT MANAGEMENT AT ED

In our region, there are 3 main species of scorpions: *Androctonus australis*, *Buthus occitanus*, and *Androctonus aeneas* (recently renamed *Androctonus bicolor*).[1,19] After a scorpion sting, admission at the ED is decided if there are any systemic abnormalities. Stage 2 severity is noted if there are no severe troubles, and stage 3 severity is defined by the presence of at least 1 life-threatening systemic manifestation.[18]

During surveillance in the ER, myocarditis is suspected whenever there are concerns with respiratory status (dyspnea, hypoxia, radiographic signs of acute pulmonary edema) or hemodynamic status (pulmonary edema, electrocardiogram abnormalities, shock). In patients with suspected myocarditis, echocardiography was performed at the cardiology department of Hedi Chaker Hospital as soon as possible.

The Habib Bourguiba Hospital institutional review board considers this analysis to be exempt from ethical review.

STATISTICAL ANALYSIS

Data reported in the text and tables indicate the mean $\pm$ SD for numeric variables and percentages or ranges for dichotomous variables. To compare qualitative variables, we used the Pearson χ^2 test and the Fisher exact test. To compare quantitative variables, we used the Student's *t* test. The significance level was $P < 0.05$.

Results

We enrolled 282 of 507 cases of scorpion envenomation registered in the ED (Figure 1). There were 105 patients aged under 15 years (37.2%) and 23 patients aged above
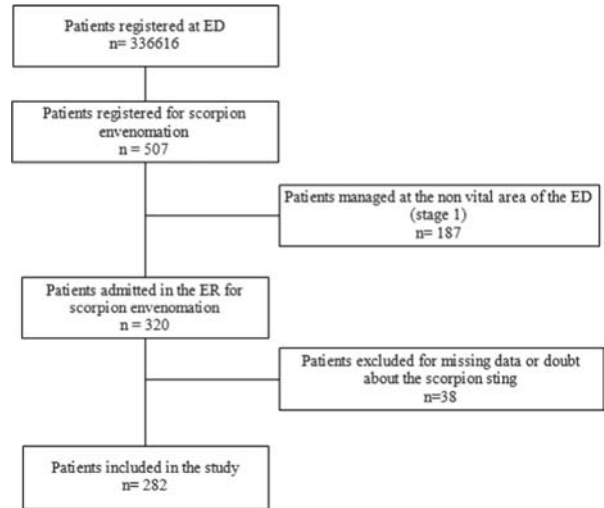

Figure 1. Flow chart explaining the sample of the study.

65 years (8.0%) (range: 1–88 years) (Figure 2). The sex ratio (M/F) was 1:1.

Forty patients (14.2%) presented one or more medical conditions. Hypertension was reported by 17 patients (42.5%), asthma by 3 patients (7.5%), and chronic renal failure by 3 other patients (7.5%).

Most patients (n=197; 69.8%) were from a rural region. Only 85 patients were from Sfax city (30.1%); 172 patients were from a rural region in the governorate of Sfax (61.0%). In 8.9% of cases, patients were referred from other EDs in the southern regions of Tunisia. The first medical contact was within the first hour after the scorpion sting in 33.3% of cases (n=94) (delay: 2.5 ± 2.5 hours; median delay: 2 hours) (Table 1). Data on the scorpion species were missing in 123 cases (43.6%). The most observed scorpion species was *A australis* (86.8%).
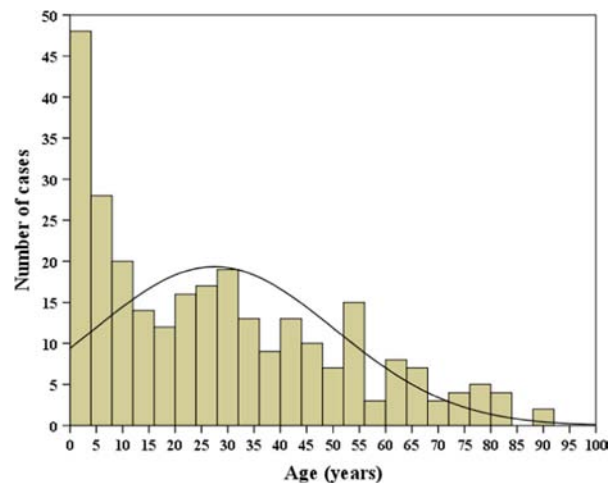

Figure 2. Distribution of the cases according to the age of patients (years).