

**Epidemiological, clinical, biological and evolutionary profile of scorpion envenomed children under one year to 15 years in the Souss Massa region of Morocco**Bouchra Darkaoui<sup>1,3</sup>, Moulay Abdelmounaim El Hidan<sup>2</sup>, Ayoub Lafnoune<sup>1,3</sup>, Driss Aroud<sup>4</sup>, Hassan Belli<sup>4</sup>, Rachida Cadi<sup>3</sup>, Ouafaa Aniq Filali<sup>3</sup>, Naoual Oukkache<sup>1</sup>  
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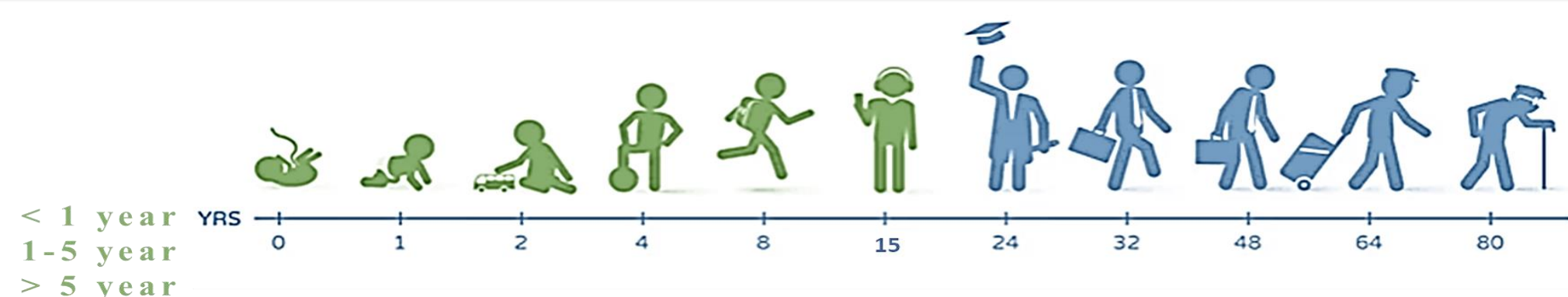
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## INTRODUCTION &amp; AIM

Scorpion envenomation remains a critical public health challenge in Morocco, which bears the highest scorpionism-related mortality in North Africa. Children represent the most affected group, accounting for nearly 89% of fatalities, yet age-stratified clinical data remain largely underexplored. The Souss Massa region, known for its high scorpion biodiversity and prevalence of highly venomous species such as *Androctonus mauretanicus*, is particularly affected. Despite the frequency and severity of pediatric cases, no previous study has comprehensively analyzed how clinical severity and outcomes vary across pediatric age subgroups.

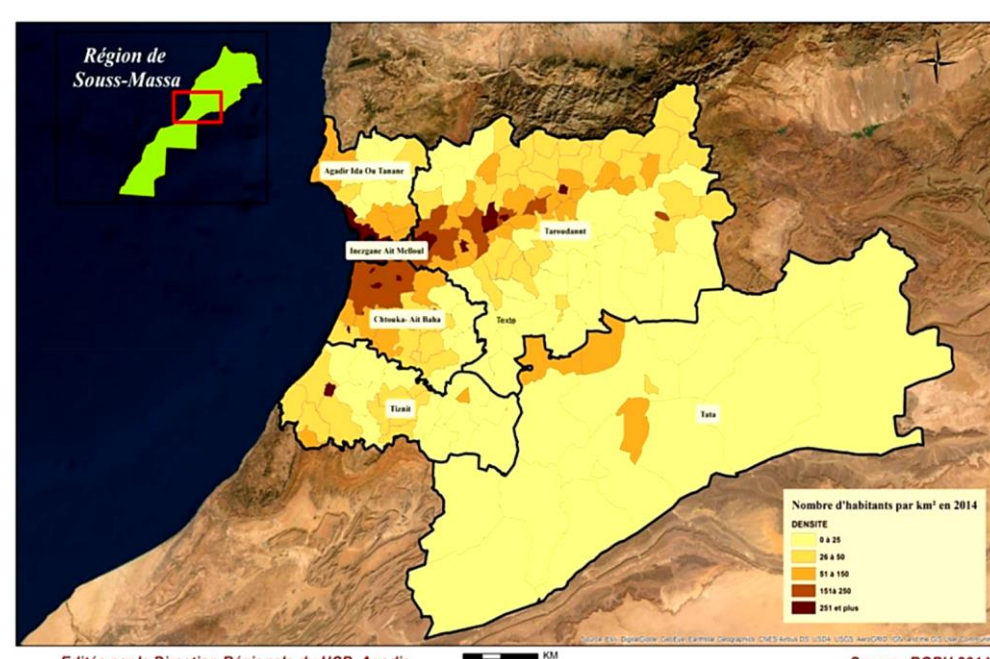
This work provides, for the first time, a detailed epidemiological, clinical, biological, and prognostic profile of scorpion envenomation in children, segmented into three critical age categories: <1 year, 1–5 years, and >5–15 years. By analyzing 383 cases over nearly a decade at the regional referral center in Agadir, this study fills a significant knowledge gap and offers evidence-based insights essential for improving triage, risk assessment, and pediatric management protocols in endemic regions.

## METHOD



Collected data encompassed demographic characteristics, clinical signs, vital parameters, biochemical profiles, and patient outcomes. All data were sourced from patient files and verified against official records from the hospital's Epidemiology Department, with full adherence to confidentiality standards. This retrospective study was conducted in the Souss Massa region, located in central-western Morocco, characterized by a predominantly arid climate. The Regional Hospital Hassan II in Agadir, the main referral center in the region, served as the study site.

Descriptive statistics (means  $\pm$  SD, percentages) and Pearson's Chi-square tests (SPSS,  $p < 0.05$ ) were applied to analyze correlations between epidemiological parameters and clinical outcomes.

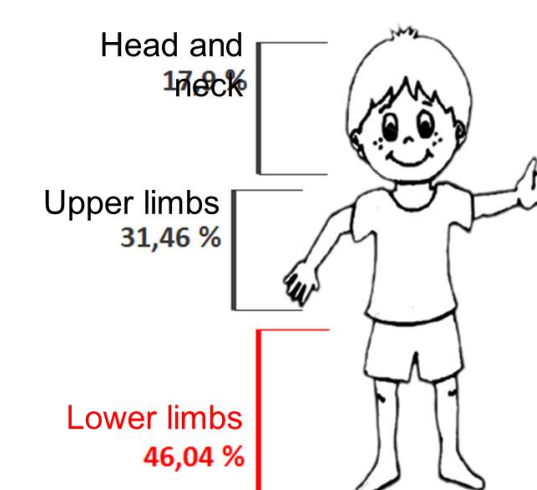


## RESULTS &amp; DISCUSSION

## The epidemiological profile

Table 1  
Epidemiological characteristics of the envenomed patients

Epidemiological characteristics		Number of patients	%
Age	<1 year	41	10.70
	1–5 years	211	55.09
	>5 years	131	34.20
Sex	Male	228	59.53
	Female	155	40.47
Time of the sting	Night	258	67.36
	Day	125	32.64
Post sting time (PST)	<1 h	14	3.66
	1–3 h	107	27.94
	>3 h	262	68.41
Length of hospital stay	1 day	66	17.23
	2–3 days	274	71.54
	>3 days	33	8.62
Admission grade	Not mentioned	10	2.61
	Grade I	153	39.95
	Grade II	201	52.48
	Grade III	29	7.57



## The biological profile

Scorpion stings induced disturbances in the body's main biochemical variables (<https://doi.org/10.1016/j.toxico.2024.107832>), namely high hyperglycemia levels, with maximum values (1.89 g/l, 1.89 g/l and 2.2 g/l) recorded in cases admitted in grade 3, and low blood creatinine values of up to 4.92 mg/l in patients aged between 1 and 5 years.

In addition, serum urea levels were increased, particularly in grade 3 patients. Scorpionic envenomation is also associated with an increase in serum ASAT and ALAT transaminases, even in patients hospitalized in grade 1

## The clinical profile

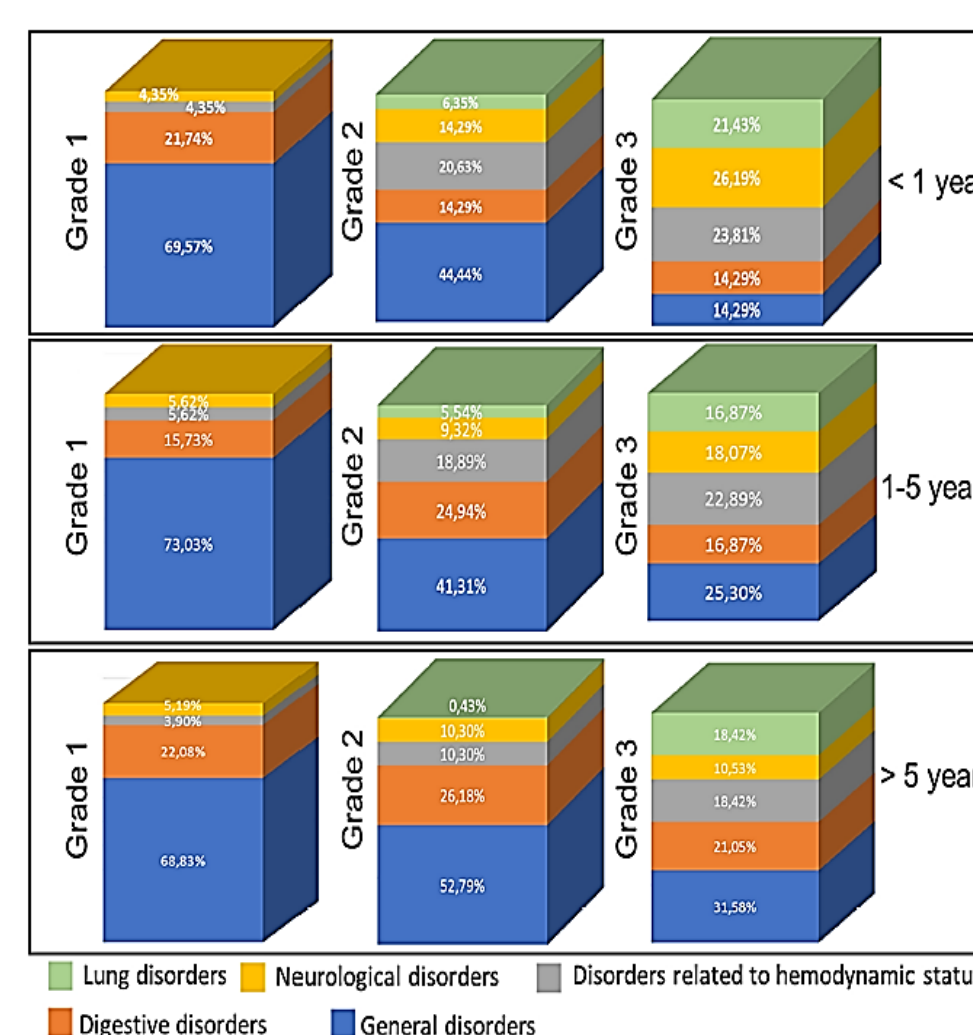


Fig. 4. Analysis of clinical signs and symptoms according to the severity of the envenomation and the age of the patients.

## The evolutionary profile

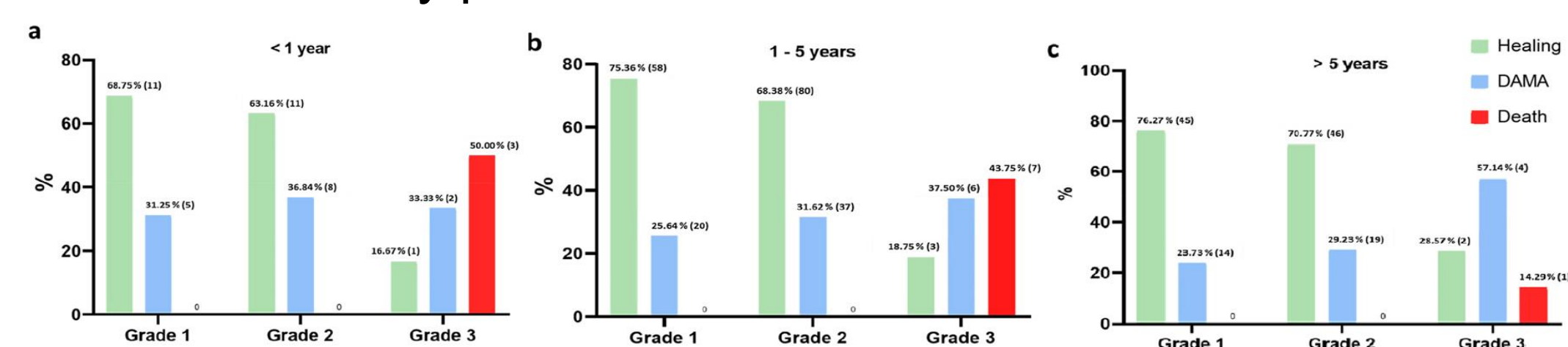


Fig. 5. Evolutionary profile of envenomed patients according to age and severity of envenomation

Positive correlation was mentioned between the state of evolution and the various epidemiological parameters, digestive symptoms, as well as signs and symptoms linked to hemodynamic state, general and neurological state.

## CONCLUSION

This study provides the first in-depth analysis of pediatric scorpion envenomation in the Souss Massa region, highlighting age-related severity and clinical outcomes. The findings underscore the need for improved therapeutic strategies and support the integration of targeted immunotherapy as a key component of effective management in health centers.