



A Cause of Hematuria Following *Hemiscorpius acanthocercus* (Scorpiones: Hemiscorpiidae) Sting in South of Iran

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Abstract

Introduction: A scorpion sting is one of the major medical problems in southern Iran. *Hemiscorpius* scorpions are the most dangerous species in this area and *Hemiscorpius acanthocercus* belonging to this genus is distributed in the southern part of Iran. The venom of this scorpion causes pathological changes in the blood and kidney of the victims, which eventually lead to hemolysis and renal failure.

Case Presentation: This report describes the occurrence of severe hematuria in a patient within a few hours after the scorpion sting.

Conclusions: The present report suggests that more studies are needed to set out a protocol for the management of scorpion stings in high risk areas.

Keywords: Scorpion Sting, Hematuria, Renal Failure, *Hemiscorpius acanthocercus*, Iran

1. Introduction

Scorpion stings are of clinical importance worldwide, which is associated with cardiovascular toxic effects or neuromuscular toxic effects that leads to illness and in children the cause of death (1). Various complications due to scorpion sting have been described in literature, such as cerebral edema, subarachnoid hemorrhage, encephalopathy, hemorrhagic, and cortical necrosis (2). *Hemiscorpius* species are the most venomous scorpions in the south and southwest of Iran. Their sting is associated with serious clinical symptoms. Most of the deaths due to scorpion stings in Iran are caused by *Hemiscorpius lepturus* (3). This case represents the first report of clinical complication of *H. acanthocercus* envenomation exhibited in the form of extensive hematuria in a young child from the South of Iran.

2. Case Presentation

A 12-year-old female resident of Bashagard, which is in the South of Iran was stung 24 hours before admission by *H. acanthocercus* on her face and flank (Figure 1). Based on her mother's description, five hours after envenomation and hematuria, she was referred to the hospital. She

received two vials of scorpion antivenom and hydrocortisone in the hospital. Due to the severe envenomation, she was transferred to the central hospital in Bandar Abbas District. Primary symptoms included vomiting, lethargy, abdominal pain, headache, fever, and hematuria. Vital signs were fever = 39.6°, BP = 100/60, PR = 110, and RR = 30. Tow cyanotic spots, erythema without pain was observed at the sting site. On the second day, her temperature was lower = 38°, WBC = 18 - 20, RBC = 25 - 30, blood = 3+, PH = 5, and the color of urine bloody. The patient was hospitalized for nine days due to the severity of the disease. Due to severe hematuria and ill condition, she was transferred to the intensive care unit (ICU). Laboratory findings on the first day are shown in Tables 1 and 2. The results of hematology and biochemistry test were as follows: Hemoglobin = 12.4 g/dL, white blood cell = $15.4 \times 10^3/\mu\text{L}$, red blood cell = $15.4 \times 10^3/\mu\text{L}$, MCV = $75.6 \times 10^3/\mu\text{L}$, platelet = $508 \times 10^3/\mu\text{L}$, SGOT = 1000 U/L, SGPT = 408 U/L, PTT = 60 S, PT = 17 S, serum creatinine = 0.5 mg/dL, sodium = 140 mEq/L, potassium = 5.6 mEq/L, BUN = 20.6 mg/dL, blood urea = 44 mg/dL, total bilirubin = 10.3 mg/dL, and urine microscopy showed hematuria. The patient was discharged with good condition on the ninth day.

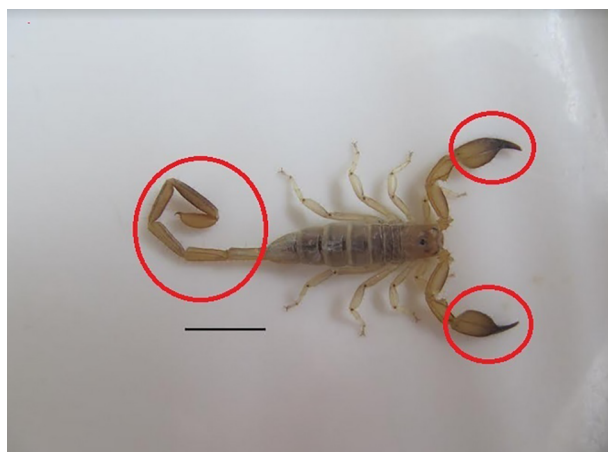


Figure 1. *H. acanthocercus* (pedipalps stout and bulky, pedipalp chela manus color predominantly orange to reddish-brown, metasoma very elongated and slender) male from Hormozgan province, south of Iran, (Scale, 10 mm).

Table 1. Urine Analysis Laboratory Test Results

Test	Results Day 1
Hemoglobin	2+
Color	Bloody
Appearance	Turbid
PH	6.5
Proteins	3+
Blood	Trace
WBC	1 - 2
RBC	3 - 4
Epithelia cells	1 - 2

Table 2. Hematology Test Results

Test	Results Day 1	Normal Range
WBC $\times 10^3 \mu\text{L}$	9.8	4 - 10
RBC, mictu/mL	4.29	4.6 - 6.2
HGB, g/dL	10	10 - 12
HCT, %	31.9	31 - 52 hk
MCV, flit	74.4	80 - 96
MCH, pg	23.3	26 - 32
MCHC, g/dL	31.3	26 - 36
PLT $\times 10^3 \mu\text{L}$	56	150 - 400

3. Discussion

The presented data in Tables 1 and 2 showed that patients who were stung by *H. acanthocercus* developed renal changes, the hematology and biochemistry paramet-

ric were significant. This data is consistent with the results of the Rahmani and Jalali (3), and Pourkhalili et al. 2014, finding in Iran. The results of the hemoglobinuria test in a study by Mohseni (4) showed that the most severe hemoglobinuria (+4) occurred in the victims stung by *H. lepturus*.

The symptoms observed in our patient was similar to some of the symptoms listed above.

Biochemistry result showed that urea, BUN, and total bilirubin increased to 44 mg/dL, 20.6 mg/dL and 10.3, respectively. Increasing BUN and Urea levels in victims were good markers of renal failure, following a *H. lepturus* sting (4). Therefore, based on this result and finding of this report, the levels of BUN of the blood may be used as factors signifying in *Hemiscorpius* sting.

In this case, calcium decreased to 8.3 mg/dL and potassium increased to 5.6 mEq/L. The neurotoxic fraction of *H. lepturus* venom contains a peptide active on Ca^{2+} channels called hemicalcin (5). Fever, confusion, hematuria, hemoglobinuria, and decrease in hemoglobin level were observed in this case. The histology results in Tables 1 and 2 showed that *H. acanthocercus* venom caused pathological changes in the blood and kidney. Based on this patient, the sting of *H. acanthocercus* does not cause severe pain. Isbester reported that the patient likened it to pain of an ant sting (1). The results of this report and other studies showed that laboratory tests including hematology, biochemistry, and urine analysis can be of great help in early detection and treatment of scorpion victims. Anemia, due to reduced RBC and hemoglobinuria, should also be seriously considered. Increasing knowledge about the mechanism of action venom, especially of medically important scorpions, can help patients. Scorpion sting is a medical problem for residents in south regions of country. In this region the most venomous scorpion is *Hemiscorpius*, which belong to the family Hemiscorpiidae. The venom of *H. acanthocercus* has cytotoxic effects. This venom result in the manifestation of a number of clinical symptom such as hemoglobinuria, proteinuria, hematuria, necrosis, hemolysis of blood cells, and lower creatinine excretion. These toxic effects are more severe and fatal in children. Urine analysis, hematology, and biochemistry data should be considered to be the most important factors in the follow-up of scorpion victims.

3.1. Conclusions

This report showed that the venom of *H. acanthocercus* such as *H. lepturus* had an effect on erythrocyte hemolysis. Therefore, *H. acanthocercus* envenoming must be considered as a serious medical emergency that requires immediate attention. Based on the available evidence, it appears

that *H. acanthocercus* is one of the most dangerous scorpions found in Hormozgan, the south Province of Iran. Due to lack of physicians' knowledge about scorpion species, treatment is difficult, therefore, patients, especially children, are at risk. This report suggests that more studies are needed to set out a protocol for the management of scorpion sting in high risk area.

Supplementary Material

Supplementary material(s) is available [here](#) [To read supplementary materials, please refer to the journal website and open PDF/HTML].

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Footnotes

Authors' Contribution: Mehran Shahi contributed to writing proposal, conducting the study, analyzing the results, and writing the paper. Parivash Davoodian contributed to performing experiments and supervised the research. Nasrin Davaridolatabadi contributed to analyzing the results and writing the paper. Mehraban Shahi contributes to analyzing the results and writing the paper.

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