Annals of Clinical Case Reports

Case Report
Published: 12 Dec, 2016

Toxic Hepatitis and Coagulopathy due to Scorpion Sting

Ataman Köse, Serdar Biricik, Seyran Bozkurt, Cağatay Cavuşoğlu and Cüneyt Ayrık*

Department of Emergency Medicine, Mersin University,Turkey

Abstract

Scorpion sting can cause simple symptoms of local reddening and pain to severe complications. However, cases of toxic hepatitis and coagulopathy have been rarely reported so far. In this paper we report a 30-year-old scorpion sting victim presenting with toxic hepatitis and coagulopathy. A 30-year-old woman presented to our emergency department with pain and numbness from finger to elbow after a scorpion sting. At 8th hour, her laboratory tests revealed increased liver enzymes, alterations in hematological parameters (thrombocytopenia, leukocytosis), and impaired coagulation tests (PT-INR prolongation and increased D-dimer). The patient was admitted to hospital by gastroenterology and hematology departments with a working diagnosis of toxic hepatitis and coagulopathy due to scorpion sting. Laboratory tests may have to be checked 6-8 hours after the initial tests in patients with scorpion sting who develop systemic signs. Physicians should particularly monitor hematological and coagulation parameters, liver function tests and cardiac enzymes and be able to apply the appropriate therapy as needed.

Keywords: Scorpion; Sting; Toxicity; Liver; Coagulation

Introduction

Scorpion stings are important threats to health, both domestically and worldwide. Scorpions sting their victims with their poisonous stings at the hind portion of their body. Amount and toxicity of particular venom may show great inter-species variability [1-3]. Ascorpion venom usually causes toxicity via excessive release of local, cardiotoxic, neurotoxic, and autonomic neurotransmitters. Depending on its toxicity, a wide spectrum of clinical signs and symptoms may be observed, from local reactions (redness, pain, and swelling) to severe consequences including respiratory, gastrointestinal, cardiac, or neurological complications. However, scorpion stings rarely cause severe poisoning. The severity of poisoning depends on a scorpion's size and species, amount of venom, and a victim's body mass and sensitivity to venom [4]. Few studies have reported renal, hepatic, pancreatic, cardiac, and hemolytic complications following poisoning by some scorpion species [5-7]. As far as we know, no reports to date have reported toxic hepatitis or coagulopathy in humans after scorpion sting. We herein report a case of toxic hepatitis and coagulopathy in a 30-year-old woman who presented to ED after a scorpion sting.

Case Presentation

A 30-year-old woman presented to our ED with pain and numbness from finger to elbow after a scorpion sting. She had no systemic disease or drug use for any reason. At admission she had a Glasgow coma score of 15 and stable vital signs. She had a body temperature of 36.7°C, a pulse rate of 70 bpm, a blood pressure of 110/70 mmHg, and an oxygen saturation of 98% via pulse oximetry (in room air). She had redness in one of her fingers, extending from the distal phalanx to the proximal phalanx. A single dose of tetanus vaccine was administered, wound area was irrigated and sterilized, and fluid replacement was begun. The initial laboratory tests revealed completely normal biochemical and hematological parameters. She was observed under monitorization at the ED. Six hours later she developed restlessness, sweating, nausea, vomiting, and hypersalivation. She was thus administered a single dose of scorpion antiserum (manufactured by Public Health Agency of Turkey) in 500 cc isotonic saline infused over one hour. A repeat examination of the patient about one hour later revealed a blood pressure of 100/60 mmHg, pulse rate of 100 bpm, body temperature of 38.7°C, and an oxygen saturation of 98%. Repeat blood samples were drawn 8 hours after admission and 1 g paracetamol (partemol, Vem, Istanbul Turkey) was administered intravenously. A control ECG showed sinus rhythm. The patient was also given 10 mg metoclopramide (primsel, Osel, Istanbul, Turkey) to prevent vomiting in addition to the fluid treatment. The etiology of fever was investigated by urinalysis and chest X-Ray, and both returned normal. The 8th hour laboratory tests revealed elevated liver enzymes (Table 1), altered hematological parameters

OPEN ACCESS

Correspondence:
Ataman Kose, Mersin University, Faculty of Medicine, Department of Emergency Medicine, Mersin, Turkey, Tel : 903242410000/2411; E-mail: ataberk76@yahoo.com.tr

Received Date: *03 Nov 2016*
Accepted Date: *06 Dec 2016*
Published Date: *12 Dec 2016*

Citation:
Köse A, Biricik S, Bozkurt S, Cavuşoğlu C, Ayrık C. Toxic Hepatitis and Coagulopathy due to Scorpion Sting. Ann Clin Case Rep. 2016; 1: 1212.

Table 1: Biochemical parameters during hospitalization period.

Değerler	AST U/L	ALT U/L	LDH U/L	ALP U/L	GGT U/L	T. Bil U/L	D. Bil U/L	CK U/L	CK-MB ng/mL	CRP mg/L
Arrival	13	12	-	64	11	0.3	<0.1	88	1.13	3.8
8. hours	606	271	1102	125	136	1.7	1.1	77	0.5	10
1. day	372	259	1016	94	160	2.5	0.9	82	1.2	125
2. days	146	161	-			2	1.2			165
3. days	68	109	-					65	0.5	102
4. days	52	94	298		77	1.1	0.5	76	0.15	157
5. days	36	73		133	119	1.8	0.2			

*AST: Aspartateaminotransferase [referans range (rr: 0-32)], ALT: Alaninetransaminase (rr: 0-31), ALP: Alkaline phosphatase(rr: 40-150), GGT: Gamma-glutamyltransferase(rr: 0-36), T.Bil: Total bilirubin (rr: 0.3-1.2), D.Bil: Direct bilirubin (rr: 0-0.3), CK: CreatineKinase (rr: 0-145), CK-MB: CreatineKinase-MB (rr: 0-5), CRP: C-reactive protein (rr: 0-5).

Table 2: Hematological and coagulation parameters during hospitalization period.

Values	WBC x10³	HGB g/dL	PLT X 10³	PT sn	INR	aPTT sn	D-Dimer ng/mL
Arrival	8.5	11.6	341	10.7	0.9	22.3	405
8. hours	3.2	11.7	130	15.7	1.4	34.7	3300
1. day	11.4	9.3	103	16.7	1.5	41.9	4760
2. days	11.8	8.8	81	16.5	1.4	49.5	
3. days	16.3	9.1	86	11.8	1.1	28	
4. days	14.2	9.2	80	12.6	1.1	32	5000
5. days	13.5	11.3	178	11.8	1	24	

Abbreviations: WBC: White Blood Count [referans range (rr: 4.5-11x10³)], HGB: Hemoglobine (rr: 11.7-15.5), PLT: Platelets, (rr: 150-400 x10³), PT: Prothrombin Time (rr: 10-14.5), INR: International Normalized Ratio (rr: 0.8-1.2), aPTT: Activated Partial Thromboplastin Time (rr: 0-35).

(thrombocytopenia, leukocytosis), and impaired coagulation tests (prolonged PT-INR, increased D-Dimer) (Table 2). Fibrinogen level was 270.9 mg/dl (reference range (rr): 175-400), and amylase, lipase levels, renal function tests, electrolytes, and cardiac enzymes were all normal. An abdominal ultrasonography demonstrated no pathology in hepatobiliary system, pancreas, or other organ systems. The patient was consulted with the Gastroenterology and Hematology Departments for scorpion sting-induced toxic hepatitis and coagulopathy, and was subsequently admitted to the gastroenterology service for follow-up and treatment. She had fever at the range of 38-38.7 for 2 days after admission and two sets of blood cultures and a single urine culture were obtained; she was also begun on empiric ampicillin sulbactam 2 x 1 g. At follow-up no proliferation occurred in blood and urine cultures and the urinalysis was also normal. The patient later developed diarrhea and a stool culture was taken, which revealed normal intestinal flora. The direct microscopic assay of the stool sample was also negative for ameba, parasites, erythrocytes, or leukocytes. An infectious diseases consultation was obtained for fever but that department made no additional recommendations for fever work-up. Blood gas analysis was normal. Isotonic saline and ringer's lactate solutions were infused. A peripheral smear to investigate the cause of thrombocytopenia was also normal. A total of 5 units of fresh frozen plasma were administered due to having elevated INR and thrombocytopenia. The patient was monitored for 6 days and discharged after clinical and laboratory improvement.

Discussion

Many medications, substances, and disorders may cause liver toxicity and coagulation disorders. However, it is very rare to observe these pathologies after scorpion sting [5-8]. Various studies have reported gastrointestinal irritation (nausea, vomiting, and diarrhea) in severe poisoning. Our patient also developed nausea, vomiting, fever, and, later, diarrhea. Diarrhea and elevated liver enzymes have been reported to be important prognosticators in severe poisoning [5,9]. We observed scorpion sting-induced hematological (thrombocytopenia and elevated INR) and biochemical alterations (elevated levels of ALT, AST, and LDH). A large-scale, 700-patient trial from Tunisia reported normal ALT and AST levels, although dying patients (n =72) had significantly higher mean ALT and AST levels compared to surviving patients [5,9]. In another report a two-year-old child was reported, who developed multiorgan failure characterized by central nervous system involvement, shock, disseminated intravascular coagulation (DIC), renal failure, hepatic failure, watery diarrhea, and death after scorpion sting. That patient developed AST, ALT, INR, and PT elevation 6 hours after ED admission and similarly had thrombocytopenia [10]. Another study reported an adult patient with acute renal injury and toxic hepatitis 24 hours after a scorpion sting [11]. In a case report from Iran, a child manifested significantly elevated AST and ALT levels 24 hours after scorpion sting. The authors suggested that elevation of these enzymes could be used as prognostic tools [12,13].

Many experimental studies have reported that various scorpion species may lead to histopathological changes in liver and spleen. Such studies have reported elevated ALT and AST levels indicating hepatic toxicity, although poisoned persons rarely developed bilirubinemia. Those studies reported that changes in liver enzymes and other laboratory parameters occurred approximately 3 to 8 hours after drawing the venom [3,6,7]. The signs and symptoms usually appear within 1 hour after scorpion sting. Complete absorption of the venom usually occurs by 7 to 8 hours. Namely, systemic symptoms may develop after 7-8 hours. Therefore, patients should be monitored for at least 6 hours after the incident [2,8]. We likewise monitored our patient for 8 hours at the emergency department; as she later developed systemic symptoms (nausea, vomiting, and fever), we checked her blood tests once again, noting that her liver

enzymes were markedly elevated. Fortunately, the levels of these enzymes progressively decreased at follow-up. Scorpion venom may also rarely have hemolytic, nephrotoxic, and cytotoxic effects in addition to hepatotoxicity [6,13]. Hence, some affected patients with intravascular hemolysis, coagulopathy, and renal injury have been reported [14,15]. We similarly observed leukopenia, leukocytosis, thrombocytopenia as well as PT, PTT, and INR prolongation. We also found that D-Dimer and LDH levels were increased.

The mechanisms of the various scorpion sting-induced organ involvements remain unclear although the hypothesis regarding the direct hemolytic and cytotoxic effects of the venom has predominated [6,13]. Additionally, stimulation of chemical mediators (neurotransmitters, catecholamines) and release of cytokines and inflammatory mediators have been implicated in hepatic and hematologic derangements [3,7,12,13]. Thus, utmost care should be taken to monitor the effect of venom causing hepatic and hemolytic toxicity on the direct action of scorpion venom on liver endothelial and blood cells.

Treatment of scorpion stings is usually symptomatic, usually consisting of fluid and electrolyte replacement and analgesic administration. Systemic toxicity may urge clinicians to administer a scorpion antivenom [5,8]. The onset of restlessness, nausea, vomiting, and hypersalivation urged us to administer antivenom. Medically manufactured by the Public Health Agency of Turkey from the species *Androctonus Crassicauda*, scorpion antivenom is effective against all types of scorpion poisonings. All effects mentioned above may show variation, depending on the scorpion species. As our patient or her relatives did not bring the culprit species, we could not perform species/type analysis. In Turkey, the species *Androctonus crassicauda*, *Leiurus quinquestriatus*, and *Mesobuthus gibbosushave* been defined as the species that threaten public health [1].

In conclusion, scorpion venom may cause hepatotoxicity and hematological toxic effects. More clinical data are needed to clarify the underlying mechanisms of scorpion venom toxicity. Repeat laboratory testing 6-8 hours after the initial examination may be needed, especially in cases with systemic signs and symptoms. Hematological tests, coagulation parameters, and liver function tests should be monitored and appropriate therapy should be started when any abnormality is observed. Emergency physicians should be watchful for the disastrous complications of scorpion poisoning.

References

1. Cesaretli Y, Ozkan O. Scorpionstings in Turkey: Epidemiological and clinical aspects between the years 1995 and 2004. Rev Inst Med Trop Sao Paulo. 2010; 52: 215-220.
2. Antopolsky M, Salameh S, Stalnikowicz R. Need for emergency department observation after scorpion sting: prospective study and review of the literature in theMiddle East. Eur J Emerg Med. 2009; 16: 206-208.
3. Zayerzadeh E, ZareMirakabadi A, Koohi MK. Biochemical and histopathological study of Mesobuthuseupeus scorpion venom in the experimental rabbits. Archives Razi Institute. 2011; 66: 133-138.
4. Albuquerque CMR, Porto TJ, Amorim MLP, Santana- Neto PL. EscorpionismoporTityuspusillusPocock, 1893 (Scorpiones; Buthidae) noEstado de Pernambuco. Revista da SociedadeBrasileira de Medicina Tropical. 2009; 42: 206-208.
5. Bouaziz M, Bahloul M, Kallel H, Samet M, Ksibi H, Dammak H, et al. Epidemiological, clinical characteristics and outcome of severe scorpion envenomation in South Tunisia: multivariateanalysis of 951 cases. Toxicon. 2008; 52: 918-26.
6. Pipelzadeh MH, Dezfulian AR, Jalali MT, Mansouri AK. Invitroand *in vivo* studies on some toxics effects of the venom from Hemiscorpious lepturus scorpion. Toxicon. 2006; 48: 93-103.
7. Cusinato DA, Souza AM, Vasconcelos F, Guimarães LF, Leite FP, Gregório ZM, et al. Assessment of biochemical and hematological parameters in rats injected with Tityus serrulatus scorpion venom. Toxicon. 2010; 56: 1477-1486.
8. Bawaskar HS, Bawaskar PH. Scorpionsting: update. J Assoc Physicians India. 2012; 60: 46-55.
9. Bahloul M, Chaari A, Khlaf-Bouaziz N, Hergafi L, Ksibi H, Kallel H, et al. Gastrointestinalmanifestations in severe scorpionenvenomation. Gastroenterol Clin Biol. 2005; 29: 1001-1005.
10. Cavari Y, Lazar I, Shelef I, Sofer S. Lethalbrainedema, shock and coagulopathy after scorpion envenomation. Wilderness Environ Med. 2013; 24: 23-27.
11. Krkic-Dautovic S, Begovic B. Acute renal insufficiency and toxic hepatitis following scorpions sting. Med Arh. 2007; 61: 123-124.
12. Jalali A, Pipelzadeh MH, Sayedian R, Rowan EG. A review of epidemiological, clinicaland in vitrophysiologicalstudies of envenomation by the scorpion Hemiscorpius lepturus (Hemiscorpiidae) in Iran. Toxicon. 2010; 55: 173-179.
13. Heidarpour M, Ennaifer E, Ahari H, Srairi-Abid N, Borchani L, Khalili G, et al. Histopathological changes induced by Hemiscorpius lepturus scorpion venom in mice. Toxicon. 2012; 59: 373-378.
14. Valavi E, Alemzadeh AMJ. Hemolytic uremic syndrome following Hemiscorpius lepturus (scorpion) sting. Indian J Nephrol. 2008; 18: 166-168.
15. Bahloul M, Ben Hmida M, Belhoul W, Ksibi H, Kallel H, Ben Hamida C, et al. Hemolytic-uremic syndrome secondary to scorpion envenomation (apropos of 2 cases). Nephrologie. 2004; 25: 49-51.