Unusual presentation of more common disease/injury

Delayed presentation of scorpion sting with cardiogenic shock

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Summary

A young farmer presented with cardiogenic shock 5 days after a scorpion sting. He was managed with norepinephrine, atropine and supportive measures and made a complete recovery. The role of atropine in treating scorpion sting has to be defined better.

BACKGROUND

Scorpion sting is common in rural India and case mortality is high due to delay in treatment. Systemic envenomation requires use of prazosin and dobutamine to improve survival rates. We present the case of a young man who had delayed systemic manifestations of scorpion sting and made a complete recovery with norepinephrine, atropine and supportive therapy.

CASE PRESENTATION

A 22-year-old farmer sustained a black-scorpion sting on his left foot. He had no local or systemic symptoms following the sting. After 4 days, he sustained trauma on his left foot, adjacent to the area of the scorpion sting. He developed local pain and swelling which was treated on an

outpatient basis. The following day, he developed 3–4 bouts of vomiting and dizziness. On evaluation by a primary healthcare physician, he was found to have hypotension and was referred to our hospital for further management. On admission, his pulse was 60/min, regular and low volume; blood pressure was not recordable; respiratory rate was 20/min, SpO₂ was 90% on room air and his peripheries were warm. There was mild swelling and redness of the left foot with two wounds; there was no local pus collection. Systemic examination was normal.

INVESTIGATIONS

Baseline reports were: total leucocyte count was 30 800/mm³, differential neutrophils 56%, bands 32%, lymphocyte 6%, monocyte 6%, creatinine phosphokinase 1096 U/l,

Figure 1 ECG showing sinus bradycardia with T-wave inversion in lead 3 and V1 and biphasic T-wave changes in V2/V3/V4.

Figure 2 Chest x-ray anteroposterior view showing cardiomegaly with pulmonary venous hypertension.

troponin t 0.38 ng/ml, haemoglobin, platelets, sugars, renal and liver function tests, amylase, lipase, cortisol and thyroid-stimulating hormone were normal. Two blood cultures and one wound swab culture were sent prior to starting antibiotics. ECG showed sinus bradycardia with T-wave inversion in lead 3 and V1 and biphasic T-wave changes in V2/V3/V4 (figure 1). Chest x-ray showed cardiomegaly with pulmonary venous hypertension (figure 2).

Echocardiography (ECHO) showed globally hypokinetic left ventricle with an ejection fraction of 39% (figures 3 and 4, video 1).

DIFFERENTIAL DIAGNOSIS

A possibility of local cellulitis with septic shock was considered. Although there were signs of inflammation of the left foot, there was no pus discharge. Both blood and wound swab cultures were sterile.

TREATMENT

A normal saline bolus of 1 litre was given stat; as blood pressure failed to improve, norepinephrine infusion was started. In addition, intravenous piperacillin–tazobactam and intravenous metronidazole, intravenous normal saline at 125 ml/h, oxygen and analgesics were administered. His blood pressure improved within 2 h. Sinus bradycardia (heart rate 35/min) was noted a few hours later—it was reverted with intravenous atropine (1.2 mg) within a few minutes. Norepinephrine was tapered over the next 5 days and the antibiotics were stopped after 1 week.

OUTCOME AND FOLLOW-UP

Follow-up echocardiogram after 1 week showed normally contracting left ventricle with an ejection fraction of 60% (figure 5, video 2). He was clinically stable at the time of discharge.

DISCUSSION

Scorpion venom can act as a neurotoxin as well as a cardiotoxin and its lethality varies with different species. The rate at which the venom is absorbed into systemic circulation depends on the site of inoculation.¹ Review of the literature describes various manifestations occurring within

Figure 3 Echocardiogram M-mode showing dilated left ventricle with decreased ejection fraction.

Figure 4 Echocardiogram four-chamber view showing a dilated left atrium (LA) and left ventricle (LV).

few minutes to 48 h of the sting.^{1–4} Hypotension and bradycardia can occur within few hours of the sting due to cholinergic stimulation and after 2–3 days due to depletion of catecholamines, following the autonomic storm.^{1–3} Severe envenomation necessitates the use of prazosin and dobutamine.^{1–5} Use of atropine is not advocated as it is postulated that the complete blockade of the parasympathetic system may allow domination of the overstimulated sympathetic system.³ Delay in initiation of treatment is a leading cause for high death rates.¹

This case is remarkable because the patient presented 5 days after the scorpion sting. Previous studies record patients reporting to a healthcare centre as late as 65 h after the event.⁴ We hypothesised that the venom was inoculated in the subcutaneous tissue initially and that the subsequent trauma facilitated rapid absorption into the systemic circulation. On presentation, vomiting, warm peripheries, bradycardia and shock were definitive signs of systemic envenomation. Findings of ECHO and positive troponin levels were consistent with the diagnosis

Video 1 Echocardiogram four-chamber view showing a dilated left ventricle with globally reduced contractility.

Video 2 Echocardiogram four-chamber view showing a normally contracting left ventricle.

Figure 5 Echocardiogram M-mode showing normal left ventricular systolic function.

of myocarditis. Sepsis was ruled out by sterile blood and wound swab cultures. Severe hypotension precluded the use of dobutamine.⁶ We felt that norepinephrine was the logical choice for treating him. Norepinephrine stimulates β -1 and α -receptors leading to positive inotropic action as well as an increase in systolic and diastolic blood pressure.⁶ In our review of the literature, we found that use of norepinephrine has been documented for cases of refractory hypotension but has not been included in the protocol for the management of severe scorpion sting envenomation.¹ Another point of interest was that we used atropine without any adverse outcome. There are conflicting data regarding the role of atropine in scorpion sting. While one of the leading authorities maintains that atropine should be avoided,¹ others have reported a positive outcome with its use.^{7–9} We felt that its role was justifiable as black scorpion venom has been observed to completely inhibit acetyl cholinesterase action in experimental animal studies.¹⁰

Learning points

- ▶ Patients with scorpion sting can present even as late as 5 days with systemic envenomation.
- ▶ Role of atropine needs to be defined in the management of systemic scorpion envenomation.

Competing interests None.

Patient consent Obtained.

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