

Teaching Point
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Acute renal failure and haemorrhagic syndrome secondary to toxin of caterpillars (*Lonomia obliqua*)

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Introduction

Accidental poisoning with caterpillars has become increasingly frequent in southern Brazil, partly due to deforestation and elimination of natural predators [1]. Caterpillars are the larval stage of moths and butterflies and are found worldwide [2]. Accidental contact with caterpillar's bristles induces allergic and toxic signs and symptoms that range from mild cutaneous reaction to severe systemic reactions, depending mainly on the number and species of the caterpillar involved. Symptoms include local irritation, urticarial dermatitis, allergy, ocular injuries, osteochondritis, haemorrhage secondary coagulopathy and acute renal failure. Haemorrhagic complications including intra-cerebral can result in mortality [2,3].

Case report

A 68-year-old European female accidentally touched *Lonomia obliqua* caterpillars on a tree whilst visiting the National Park of Iguacu Falls in southern Brazil (Figure 1). This resulted in localized burning pain, erythema and oedema. By the next day, this had resolved but she had generalized myalgia and ankle oedema and later haematuria and gingival haemorrhage. By Day 2, she had melaena and was admitted to hospital.

On examination, she was pale and mildly jaundiced. She was eupneic and afebrile. Active gingival haemorrhage and ankle oedema were observed. Her blood pressure was 140/90 mmHg, pulse 86/min and lungs were clear on auscultation. The findings of blood tests on arrival were Hb

9.8 g/dL, Hct 27.7%, WBC 14/mm³, platelet count 75 × 10⁹/L, urea 20.8 mmol/L, creatinine 455.3 µmol/L, bicarbonate 16.5 mmol/L, pCO₂ 3.69 kPa, BE -9.8 mmol/L, bilirubin 75.24 µmol/L, indirect bilirubin 56.43 µmol/L, AST 52 U/L, ALT 44 U/L, PT 11.7 s (INR 1.02), APTT 34.4 s, fibrinogen 1.09 mmol/L and CPK 740 U/L. Serum electrolytes and glucose were normal. Urine microscopy showed 25 non-fragmented red cells per high-power field.

A diagnosis of *Lonomia* toxin poisoning and subsequent acute kidney injury (AKI) and coagulopathy was made. A central line was inserted and after the initial haemodialysis session she was given 10 ampoules of anti-lonomic horse serum. Short daily dialysis for 2 h per day was continued for the next three consecutive days. Despite an improvement in symptoms, the haematocrit initially continued to fall (19.1%) and despite the administration of antiserum before normalization of the blood counts and coagulation, a total of 3 units of packed red cells and 7 units of cryoprecipitate were needed. She was discharged on the ninth day of hospitalization with creatinine 247.52 µmol/L, urea 20.3 mmol/L, Hct 36%, platelets 240 × 10⁹/L, total bilirubin 28.72 µmol/L and fibrinogen 2.24 mmol/L.

Five months later, she was normotensive on 5 mg of ramipril and her creatinine was 97.24 µmol/L (eGFR 52 mL/min/1.73 m²). Eleven months later, her eGFR is 60 mL/min.

Discussion

As these caterpillars cluster in large numbers on tree barks and blend in so well (Figure 1), contact with large numbers of caterpillars can occur exposing the individual to larger, more dangerous doses of venom.

The case described is at the more severe end of the clinical spectrum. It is typical in that the systemic illness was preceded by an immediate local cutaneous reaction with burning pain, erythema and oedema. Malaise, fever, nausea and myalgia followed. The coagulopathy becomes apparent, typically within 48 h after poisoning, presenting with ecchymosis and the bleeding complications described [2,4].

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Fig. 1. Caterpillars (*L. obliqua*) on the trunk of a tree (picture taken by the patient).

Two species of *Lonomia*, the Brazilian caterpillar *Lonomia obliqua* and the Venezuelan caterpillar *Lonomia achelous*, provoke activation of the coagulation cascade through the action of several compounds that are the subject of toxicology research [2]. In *L. obliqua* bristle extract, toxins were identified including a factor X activator named Losac and a prothrombin activator named Lopap [5,6]. Zannin *et al.* reported a series of 105 patients poisoned by *L. obliqua* and found coagulation factor depletion and enhanced levels of fibrin degradation in keeping with a disseminated intravascular coagulation although platelet counts were typically preserved [7].

Mortality in Brazil secondary to these toxins peaked at 20% before falling to <2% following the introduction of the anti-*Lonomia* serum (in Brazil) in 1995 and educational campaigns [1]. The recent mortality of a 22-year-old in

Canada highlights the importance of considering this diagnosis in those travelling back from these regions [3]. Since 1989 the southern Brazilian States have reported accidental poisoning by *L. obliqua* in 2,067 individuals, 1.9% developed AKI and of these 32% required dialysis and 10.3% developed chronic kidney disease.

Even with anti-*Lonomia* serum, AKI can still occur [8]. Coagulation factors tend to be more profoundly altered in all patients with AKI in keeping with these being more severe cases. The renal lesion appears to be secondary to massive deposition of fibrin in the glomeruli leading to ischaemia. Some of the toxin components also result in direct toxicity to endothelium and tubular cells. The histology is poorly characterized owing to the coagulopathy-preventing biopsies in the acute phase of the illness.

Teaching points

1. When travelling to endemic zones in Central and South America, travellers should be aware of poisonous caterpillars and avoid direct contact.
2. In the case of accidental poisoning, report this immediately to the health authorities nearest to the site where the poisoning took place as they are more likely to have immediate access to anti-*Lonomia* horse serum. Most countries do not stock this product.
3. Timely administration of the antidote and supportive measures are critical.

Conflict of interest statement. None declared.

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