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ERUCISM DUE TO *LONOMIA SPP.* WITH CUTANEOUS HEMORRHAGIC SYNDROME. FIRST CASE REPORTED IN THE NORTHERN COAST OF COLOMBIA

Keywords: Butterflies; Hemorrhage; Disseminated Intravascular Coagulation.
Palabras clave: Mariposas; Hemorragia; Coagulación Intravascular Diseminada.

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ABSTRACT

Introduction: In South America, accidents involving caterpillar venom of the genus *Lonomia* have become a growing public health concern in recent years. Treatment includes the use of antilonomic serum and careful monitoring in hospital settings. However, the severity criteria and diagnostic tests to approach the patients are still unclear.

Case presentation: A 35-year-old farmer from La Jagua de Ibirico, Cesar (Colombia), was admitted to a local primary care hospital on November 25, 2018, due to headache, dizziness, and left arm pain. He reported being stung by an animal whose species he could not identify 5 days earlier, experiencing immediate pain in the affected arm. After ruling out several infectious diseases and a possible ophidian accident, and considering his clinical course, erucism due to *Lonomia spp.* was suspected. Two weeks after the event, treatment was started with antilonic serum obtained from the Butantan Institute of Brazil, which resulted in complete resolution of the symptoms. No complications related to the event were observed during the follow-up performed at 3 days, 1 month, and 3 months.

Conclusion: Primary care physicians must be adequately trained on *Lonomia spp.* accidents, since their diagnosis is mainly based on an accurate clinical assessment and erucisms (the most severe form of this type of poisoning) may manifest in an atypical manner, as in the case presented here, in which the patient developed a cutaneous hemorrhagic syndrome.

RESUMEN

Introducción. Los accidentes con veneno de orugas del género *Lonomia* en Suramérica se han convertido en un problema de salud pública en los últimos años debido a su incremento. El tratamiento de estos eventos incluye la administración de suero antilonómico y la monitorización cuidadosa en entornos hospitalarios; sin embargo, los criterios de gravedad y las pruebas diagnósticas para su abordaje aún no son claros.

Presentación del caso. Hombre de 35 años residente en La Jagua de Ibirico, Cesar (Colombia), quien el 25 de noviembre de 2018 ingresó a un hospital local de primer nivel de atención por cefalea, mareos y dolor en brazo izquierdo. El paciente relató haber sido picado 5 días antes por un animal cuya especie no pudo identificar, experimentando dolor inmediato en el brazo afectado. Tras descartar varias enfermedades infecciosas y un posible accidente ofídico, y considerando la evolución clínica, se sospechó de erucismo por *lonomia spp.* y 15 días después del evento se inició tratamiento con suero antilonómico obtenido del Instituto Butantan de Brasil, con lo cual se logró la resolución completa de los síntomas. Durante el seguimiento hecho a los 3 días y los controles realizados al mes y a los 3 meses no se observaron complicaciones relacionadas con el evento.

Conclusión. Es crucial que los médicos de atención primaria reciban una formación adecuada sobre los accidentes causados por *Lonomia spp.* ya que su diagnóstico se

basa principalmente en una evaluación clínica acertada y los erucismos (forma más grave de este tipo de envenenamiento) pueden manifestarse de manera atípica, como en el caso presentado donde el paciente desarrolló un síndrome cutáneo hemorrágico.

INTRODUCTION

The caterpillars of the genus *Lonomia* are greenish-brown larvae with yellow spots (1) that can reach a maximum length of 6–7 cm. They tend to form colonies of 20 to 30 individuals, mainly on trees such as cedar, orange, banana, and plum trees (2). These caterpillars have spines along their body that serve as a defense mechanism against predators since they are connected to glands producing a venom that is released under the skin of the victim when the spines break during contact with the animal. This venom contains proteolytic, histaminergic, and anticoagulant substances that circulate through the hemolymph and are stored in the teguments (3).

Lonomia spp. venom activates the fibrinolytic system, leading to reduced levels of fibrinogen, factor V, factor XIII, plasminogen α -2-antiplasmin, and C-reactive protein. Thus, the poisoning produces hypofibrinogenemia due to intense and persistent fibrinolysis related to moderate fibrinolytic, amidolytic, and procoagulant activity (4).

Accidents caused by lepidoptera can result in different syndromes that are classified as follows: a) erucism, which occurs after having direct contact with the caterpillar and is characterized by localized epidermolysis bullosa, macular rash, and urticaria; b) lepidopterism, which is caused by coming into contact with the hairs of the adult moth and is characterized by urticaria, headache, nausea, conjunctivitis, vomiting, bronchospasm, and dyspnea; c) dendrolimiasis, which is associated with the presence of inflammatory arthropathies; d) ophthalmia nodosa; and e) consumption coagulopathy with secondary fibrinolysis. The symptoms of the lonomic accident usually appear between 2 and 72 hours after coming into contact with the animal and present with headache, nausea, ecchymosis, hematuria, renal insufficiency, and gingival, nasal, genital and intracranial hemorrhage (3,5). After such accidents, the platelet count usually remains within normal parameters, while other factors such as factors II, VII, and protein C may be affected to different degrees (3).

In *Lonomia* spp. accidents, clinical severity and laboratory patterns depend on the amount of venom inoculated, the species of caterpillar involved, and its stage of development (6). However, it has been established that coagulation tests show prolongation of prothrombin (PT) and thromboplastin (PTT) times and that there are two distinct phenomena: intense fibrinolytic activity caused by activation of the fibrinolytic system and proteolysis of factor XIII and moderate disseminated intravascular coagulation due to procoagulant agents (7).

The diagnosis of these accidents is mainly based on the clinical course, and special attention should be paid to local and systemic manifestations. In case of systemic symptoms, the diagnosis should be confirmed by blood tests such as

complete blood count, PT, PTT, and renal function tests (8–10). Variability in clinical presentation can often delay initiation of appropriate treatment.

The treatment of lonomic accidents focuses on the use of anti-inflammatory drugs and antihistamines. Moreover, an antivenom is currently available and is considered the first option for treatment. The effectiveness of this treatment can be monitored through coagulation tests (10).

In Colombia, the presence of caterpillars of the genus *Lonomia* has been reported in several departments, including Guainía, Valle del Cauca, Boyacá, Antioquia, Cundinamarca, Meta, Casanare, Caldas, Villavicencio, Arauca, and Amazonas. The mortality rate due to accidents with these species has been estimated at 2.5% (8).

The following is a description of the first case of an accident caused by a caterpillar of the genus *Lonomia* diagnosed in the department of Cesar, on the northern Colombian coast.

CASE PRESENTATION

A 35-year-old male resident of the rural area of La Jagua de Ibirico (Cesar), was admitted to the Hospital Jorge Isaac Rincón Torres (primary care level institution) on November 25, 2018, as he had been stung on his left arm 5 days earlier by an animal that he could not identify. The injury caused immediate pain and bruising around the sting site (Figure 1), as well as dizziness and headache, which appeared 48 hours after coming into contact with the animal and were persistent. The patient had no history of disease, surgery, toxicology, transfusion, or pharmacology. On admission to the hospital, laboratory tests were performed, and the results are presented in Table 1.



Figure 1. Extensive ecchymosis on the affected limb 5 days after the accident.

Source: Image obtained while conducting the study.

Table 1. Timeline of laboratory tests performed to the patient.

Test	Result 26/11/2018	Result 29/11/2018	Result 03/12/2018	Result 08/12/2018	Reference values
White blood cells ($10^9/L$)	6.9	8.7	9.9	9.0	5.0–10.0 $10^9/L$
Lymphocytes ($10^9/L$)	1.6	0.7	0.5	2.0	1.3–4.0 $10^9/L$
Monocytes ($10^9/L$)	0.45	0.18	0.12	0.18	0.15–0.70 $10^9/L$
Eosinophils ($10^9/L$)	0.01	0.00	0.00	0.05	0.0–0.5 $10^9/L$
Basophils ($10^9/L$)	0.01	0.00	0.00	0.05	0.0–0.15 $10^9/L$
Red blood cells ($10^{12}/L$)	2.71	2.77	2.72	4.0	4.0–5.5 $10^{12}/L$
Hemoglobin (g/dL)	8.8	8.0	8.0	11.2	12.0–17.4 g/dL
Hematocrit (%)	24.6	24.0	24.0	35.3	36.0–52.0 %
Platelets ($10^9/L$)	160.0	130.0	120.0	170.0	150.0–450.0 $10^9/L$
Mean platelet volume (fL)	7.8	7.6	7.5	8.2	8.0–15.0 fL
Serum creatinine (mg/dL)	0.95	0.92	0.90	0.92	0.51–0.95 mg/dL
Urea nitrogen (mg/dL)	19.81	19.20	19.12	19.18	7.0–18.0 mg/dL
Sodium (mol/L)	145.0	145.0	145.0	145.0	135.0–145.0 mmol/L
Potassium (mmol/L)	3.76	3.5	3.3	3.6	3.5–5.5 mmol/L
Chloride (mol/L)	104.5	104.0	104.5	104.0	98.0–107.0 mmol/L
Partial thromboplastin time (seconds)	25.9	20.3	20.7	33.0	30.0–43.0 seconds
Prothrombin time (seconds)	10.0	8.0	8.0	12.0	10.0–14.0 seconds
Fibrinogen (mg/dL)	98	<60	<60	200	200–400 mg/dL

Note: values in red were altered.

Source: Own elaboration.

On the second day of hospital admission, ionogram, liver and renal function tests, chest X-ray, and abdominal ultrasound were requested, all of which were normal. Treatment was started with Hartman 500cm³ intravenous (IV) at 90cm³ every hour, Losartan 50mg orally every 12 hours, ampicillin/sulbactam IV every 8 hours, clindamycin 600mg IV every 8 hours, and vitamin K 10mg IV every 12 hours. In addition, a unit of fresh frozen plasma (FFP) was transfused to correct the coagulation problems. The following day, the patient was transferred to the hospital's internal medicine service.

Despite receiving vitamin K and FFP, there was an increase in ecchymosis and pain in the affected forearm after 4 days of hospital admission (November 29, 2018), and signs of edema were evident (Figure 2). Moreover, the patient presented hematuria, skin bleeding, decreased hemoglobin levels, hemodynamic decompensation, and hypotension (Table 1). As there was no improvement in coagulation, transfusion of 1 unit of FFP every 12 hours was started and daily monitoring with PT and PTT tests and fibrinogen tests was requested.



Figure 2. Extensive edema and ecchymosis in the affected limb 9 days after the accident.
Source: Image obtained while conducting the study.

Due to the clinical presentation and the behavior of the coagulation parameters, on the sixth day of hospital admission, an ophidian bothropic accident with high risk of hypovolemic shock and severe hemorrhagic manifestations was suspected. Therefore, 10 vials of IV antiophidic serum (AOS) were administered over a period of 2 hours, and an evaluation by the infectious disease and toxicology departments was requested.

In spite of treatment with AOS, hematuria persisted and the patient's PT and PTT increased. In view of this course, the infectious disease and toxicology services ruled out the initial suspicion of an ophidian accident and raised the possibility of a lonomic accident. That same day, the departmental health authority (Centro Regulador de Urgencias Emergencias y Desastres de la Secretaría de Salud) was contacted to arrange the importation of the antilonic serum (SaLON) from Brazil. At this time, the patient was transferred to the Clinica de Alta Complejidad del Caribe, located in Valledupar, Colombia, because he was jaundiced and hematuria and prolonged PT and PTT persisted, increasing the risk of bleeding, hemodynamic instability, and hypovolemic shock.

Finally, 15 days after the event, the patient received 10 vials of SaLON diluted in 250mL of saline solution over a period of 10 minutes. As no allergic reactions occurred, the infusion was continued for an additional 30 minutes. Hematology tests performed 48 hours after the administration of SaLON showed an improvement in hematological parameters, including a partial recovery in hemoglobin, red blood cells, and platelet levels. Furthermore, PT and PTT test results were

normalized, which was reflected in the stabilization of fibrinogen levels and was associated with the resolution of ecchymosis, disappearance of hematuria, and normalization of urinary and energy expenditure (Table 1).

Even though the patient had moderate anemia, his coagulation times were corrected, so on the second day after treatment he was transferred back to the Hospital Jorge Isaac Rincón Torres to continue medical treatment there. Due to his favorable progression, the patient was discharged four days after the administration of SaLON. Follow-up clinical tests performed one and three months later showed a satisfactory progression with no sequelae or complications.

DISCUSSION

This report describes the first case of a lonomic accident documented in the northern Colombian coast. In this case, the results of the patient's laboratory tests revealed alterations in several blood and coagulation parameters from admission, including red blood cells, hemoglobin, hematocrit, red cell distribution width, mean platelet volume, PT, PTT, and fibrinogen levels. These manifestations, as described by Chan *et al.* (10) in their case report, become evident from 1 hour to 10 days after the exposure to the venom.

During the hospital stay, both platelets and fibrinogen were quantified every 8 hours to adjust therapy following the recommendation of Arocha-Piñango & Guerrero (11), who in their literature review suggest doing this type of follow-up in patients showing alterations in blood parameters after having contact with a caterpillar.

Erucism caused by *Lonomia spp.* is the most severe form of this type of poisoning and presents with hemorrhagic symptoms that may appear between 6 and 72 hours after the contact with the caterpillar, being more severe after 48 hours (12). In the clinical case presented here, the patient developed ecchymosis, local pain, dizziness and headache, which is consistent with what has been described by Arango *et al.* (12) in one of their 2 reported cases, in which the patient presented ecchymosis, bleeding phlycten, headache, chills, and arthralgia 48 hours after contact with the animal.

In the case reported, the clinical manifestations were initially treated with analgesics, antibiotics and AOS, but after the infectious diseases and toxicology services ruled out infection and ophidian accident, respectively, the patient received SaLON, which resulted in a favorable outcome. The use of this serum, as mentioned by Ángel-Mejía *et al.* (13), is recommended for the treatment of patients who have suffered a lonomic accident.

Some studies report renal failure and intracranial, intrapulmonary, and intracerebral and nasal hemorrhage in cases of lonomic accidents (12–16); however, these effects were not observed in the patient of the reported case. The complex effects of *Lonomia spp.* poisoning are attributed to several toxins that act synergistically, resulting in a variety of clinical manifestations. The diagnosis of a lonomic accident

is based on clinical findings and its treatment requires general measures such as rest, use of anti-inflammatory drugs, and management of bleeding and coagulation alterations; in severe cases, the administration of SaLON is necessary (17-19). Prognosis varies depending on individual patient characteristics, the amount of venom inoculated, the promptness with which SaLON is administered, pre-existing medical conditions, and possible complications that may occur (19,20).

CONCLUSION

Primary care physicians need to be adequately trained on lonomic accidents since their diagnosis is mainly based on an accurate clinical evaluation and erucisms (the most severe form of this type of poisoning), which may manifest in an atypical manner, as in the case presented here, in which the patient developed a cutaneous hemorrhagic syndrome.

ETHICAL CONSIDERATIONS

For the preparation of this case report, the patient signed an informed consent form, indicating that he consented to the use and publication of their medical records and photographs. The anonymity of the information was guaranteed at all times.

CONFLICTS OF INTEREST

None stated by the authors.

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