

# FATAL INTRACEREBRAL HEMORRHAGE SECONDARY TO *LONOMIA OBLIQUA* CATERPILLAR ENVENOMING

## Case report

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**ABSTRACT** - The case of a 70 year-old, previously healthy woman who developed a severe bleeding diathesis shortly after touching a *Lonomia obliqua* caterpillar and finally died from multiple intracerebral hemorrhages is described. Brain hemorrhages are the leading cause of death in patients envenomed by the *Lonomia* species. The pertinent literature is reviewed and the most relevant clinical features highlighted, with emphasis on diagnosis. The use of new therapeutic options such as anti-*Lonomia* serum is discussed.

**KEY WORDS:** intracerebral hemorrhage, *Lonomia obliqua*, caterpillar envenoming.

### Hemorragia intracerebral fatal causada por acidente com *Lonomia obliqua*: relato de caso

**RESUMO** - O caso de uma mulher de 70 anos, previamente hígida, que desenvolveu diátese hemorrágica grave após contato com uma lagarta *Lonomia obliqua*, resultando em óbito por hemorragia intracerebral é relatado. Hemorragias cerebrais são uma das causas de morte em acidentes por *Lonomia*. A literatura pertinente é revisada, sendo as características clínicas e laboratoriais mais relevantes discutidas com ênfase para o diagnóstico, e o uso de novas abordagens terapêuticas como o soro anti-*Lonomia*.

**PALAVRAS-CHAVE:** hemorragia intracerebral, *Lonomia obliqua*, envenenamento, lagartas urticantes.

First described by Arocha-Pinango and Layrisse in Venezuela in 1967<sup>1</sup>, the hemorrhagic diathesis caused in humans by touching the *Lonomia* species begins with inflammatory changes at the site of envenoming, followed by systemic symptoms such as headache, fever, vomiting and malaise. After 24 hours, a severe bleeding disorder ensues, leading to echimosis, hematuria, pulmonary and intracranial hemorrhages, and acute renal failure<sup>2</sup>. Two species of *Lonomia* are known to cause the hemorrhagic syndrome, *Lonomia achelous*, found in Venezuela and the north of Brazil, and *Lonomia obliqua*, found in the south of Brazil<sup>1,3,4</sup>. Although there are differences in the effect of the venom of both species, both venoms may lead to intense fibrinolytic activity associated with consumption coagulopathy, resembling a diffuse intravascular coagulation<sup>5-7</sup>. A case of accidental *Lonomia obliqua* envenoming is described, and its implications are discussed. The report was approved by the institutional regulatory committee.

### CASE

A 70 year-old, previously healthy woman developed a sudden coma. Four days before, she had started to present hematuria. Shortly after admission, her coma was rated as Glasgow 3. Physical examination revealed several skin hemorrhages, and gross hematuria was present. Based on information in a note left by the patient, two small hyperemic lesions were identified on the tip of her left toe. Along with the note was the green caterpillar (Fig 1) which was hidden inside of her slipper. CT-scan imaging revealed multiple intracerebral hemorrhages (Fig 2). She died seven days after being envenomed. Her laboratory data is summarized in the Table.

### DISCUSSION

Presentation of the symptoms of caterpillar envenoming can generally be classified as follows: a) eruicism (a local inflammatory reaction); b) lepidopterism (systemic reactions); c) dendrolimiasis (a chronic form of lepidopterism characterized by dermatitis, migratory inflammatory polyarthritis or polychondri-

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Table. Laboratory results.

	Admission (fifth day)	Sixth day	Seventh day	Reference values
Hematocrit (%)	36	28	30.3	35 - 45
Leukocyte count x10 <sup>3</sup> /μl	17,700	12,100	8,500	4,800 - 10,800
Platelet count x10 <sup>3</sup> /μl	169,000	114,000	110,000	150,000 - 450,000
PT (seconds)	18.5	19.7	17.5	11-15
PTT (seconds)	58.6	47	>100	25 - 35
Creatinine (mg/dL)	0.8	-	1.1	0.6 - 1.2
Na <sup>+</sup> (meq/L)	138			135 - 145
K <sup>+</sup> (meq/L)	4.0			3.5 - 5.0
Glucose (mg/dL)	75			60 - 110
Fibrinogen (mg/dL)		92.4		175 - 433

\*Conventional units.

Fig 1. *Lonomia obliqua* caterpillar.

tis, chronic osteoarthritis and acute scleritis); d) ophthalmia nodosa (caused by specific families of caterpillars); and e) consumptive coagulopathy with secondary fibrinolysis<sup>8</sup>.

The clinical manifestations of *Lonomia* sp envenoming can include a local inflammatory reaction, which starts immediately after contact; systemic reactions such as headache, fever, vomiting and asthenia, which start some hours after exposure; and a bleeding diathesis, characterized by hematomas and ecchymoses, hematuria, pulmonary hemorrhage, intracerebral hemorrhage and acute renal failure<sup>2,7,9</sup>.

Due to their greater exposure to the environment, men are more frequently envenomed than women. The site of envenoming usually involves the upper limbs, as the caterpillars live in fruitiferous trees<sup>4,10</sup>.

The severity of the envenoming is related not only to the number of caterpillars involved but also to the intensity of the exposure, since the venom is present not only in the caterpillars' spines but also in their skin, which consists of a complex tegument with several cuticular specializations such as spicules or sco-

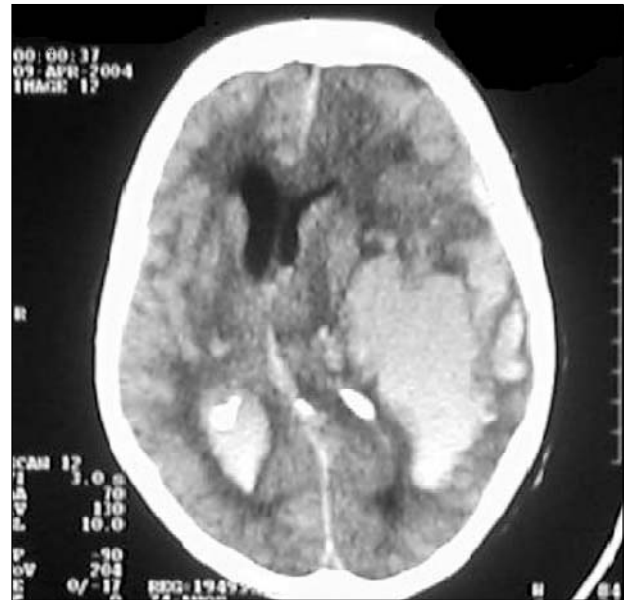


Fig 2. Ct-scan imaging with multiple intracerebral hemorrhages.

li<sup>11,12</sup>. The best characterized toxin in this venom is known by its acronym LOPAP, *Lonomia obliqua* prothrombin activator protease<sup>13</sup>.

*Lonomia* envenoming is frequent in Brazil. In the state of Paraná alone, in the south of Brazil, 354 cases were reported between 1989 and 2005<sup>14</sup>. In the same State, lethality has been decreasing, and fell from 20% in 1995 to 1.5% in 1998, but, interestingly enough, intracranial hemorrhage was confirmed as the leading cause of death in three out of the six fatal cases reported. In the remaining three fatal cases this data was unavailable due to insufficient ancillary support in the rural areas<sup>10,14</sup>.

Attempts to clarify the underlying mechanisms of intracranial hemorrhage focused on the blood-brain barrier in Wistar rats six hours after exposure to *Lo* -

*nomia obliqua* venom. Hippocampal and cerebellar edema were observed, and these resolved 72 hours after the envenoming. Only a single rat out of 28, however, developed intracerebral hemorrhage<sup>15</sup>. In another study, the venom could not be traced in the brain 6 and 18 hours after administration, but could be found in the kidneys and liver. This evidence suggests that the brain is less vulnerable to LOPAP and that toxins other than LOPAP may also be the cause of brain damage in *Lonomia* envenoming. It also points to an interaction between both the venom and individual factors<sup>15</sup>. Indeed, until the present case, intracranial hemorrhages leading to death had only been described in cases of severe envenoming after exposure to multiple *Lonomia* caterpillars at the same time.

Laboratory findings include a normal platelet count, anemia, a prolonged prothrombin time (PT), and decreased fibrinogen, plasminogen, factor V and factor XIII levels associated with increased fibrin degradation products.

The clinical and laboratory manifestations of envenoming in the case described above are similar to those described in previous reports<sup>5,6</sup>. There was an increase in the PT and activated partial thromboplastin time (PTT), a reduction in fibrinogen and a mild reduction in the platelet count (Table). Zannin et al.<sup>7</sup> also described a significant reduction in coagulation factors V, XIII and VIII, prekallikrein, plasminogen,  $\alpha$ -antiplasmin and protein C in patients with fibrinogen levels below 50 mg/dL. They concluded that the hemorrhagic syndrome is the result of consumption coagulopathy and secondary fibrinolysis.

Therapy with whole blood or fresh frozen plasma usually results in a sharp decrease in platelet count, leading to renal insufficiency and death. A more reasonable approach is the administration of antifibrinolytics agents on their own or in combination with cryoprecipitate or purified fibrinogen<sup>16</sup>. The prognosis is related not only to the severity of the envenoming but also to early intervention.

In the 90's, Silva et al.<sup>17</sup> demonstrated that horses could produce effective antibodies against *Lonomia obliqua* spine venom. Since then, the antilonomic serum (SaLon) produced at Instituto Butantan has proven effective for treating envenomed individuals<sup>17-19</sup> and has been approved by the Brazilian regulatory agency. Caovilla and Barros<sup>20</sup> have recently proven its efficacy in 44 envenomed individuals, with either 17.5 mg or 10.5 mg doses. The latter dose was chosen as the ideal one. They also observed that ear-

ly intervention lead to fewer hemorrhagic complications.

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