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CASE REPORT

ENVENOMATIONS BY COLUBRIDS: CASE REPORTS

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ABSTRACT

Introduction: Envenomations by non-venomous snakes in Brazil are poorly accounted for and classified as mild, in which pain, erythema and local edema are reported. Objective: To describe accidents by *Philodryas olfersii* and *Hydrodynastes gigas* that occurred in the State of Pará, Brazil. Case report: The patient bitten by *Philodryas* presented bleeding, pain, local edema and axillary adenopathy. The patient bitten by *Hydrodynastes* had pain, local growing edema, as well as ecchymosis, fever and headache. No laboratory tests were performed. The treatment was based on pain control after identification of the snakes. Conclusion: The local symptomatology of colubrids is similar to accidents with *Bothrops*. It is important that health professionals perform a correct diagnosis for proper treatment.

KEY WORDS: Colubridae; snake; snakebites; *Philodryas olfersii; Hydrodynastes gigas*.

INTRODUCTION

In Brazil, there are about 20,000 cases of snake accidents per year, with non-venomous snakes accounting for 4.8% of the records (Brasil, 2015). Among the non-venomous snakes, are colubrids. Currently the Colubridae family is composed of seven subfamilies, including Colubrinae and Dipsadinae (Vitt & Caldwell, 2014), where most species are recorded (Costa & Bérnils, 2015) covering the aglyphous and opisthoglyphous species, the latter capable of causing envenomation in humans, since they have fangs which are small and furrowed, located in the posterior part of the jaw and connected to venom glands called Duvernoy glands, which produce toxic secretions; however, these are conventionally considered non-venomous and the composition of the venom is not well-known (Kardong, 2002; Hess & Squaiella-Baptistão,

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2012). In Brazil, there are reports of envenomation by colubrids from the genera *Philodryas* (Correia et al., 2010; Medeiros et al., 2010), *Boiruna* (Santos-Costa et al., 2000), and *Liophis* (Santos-Costa & Di-Bernardo, 2000) Human envenomation by these genera may cause local hemorrhage, local inflammatory processes and / or necrosis, and may or may not develop systemic manifestations (Silveira & Nishioka, 1992; Prado-Franceschi & Hyslop, 2002; Medeiros et al., 2010). The objective of this study is to describe two confirmed cases of human envenomation by *P. olfersii* and *H. gigas* that occurred in the state of Pará, Brazil.

CASE REPORTS

Case 1. In January 2006 a 19-year-old biology student was bitten on the left forearm by an adult snake of the *H. gigas* species popularly known as "Pepeua" (Figure 1) in the Municipality of Muaná, Marajó, Pará, Brazil. He immediately washed the area with soap and water. After 30 minutes he noticed the emergence of a mild edema without bleeding or pain at the bitten site. An hour after the bite, he began to feel a throbbing pain at the site of the bite and the edema spread to the hand and the rest of the forearm. After about four hours, the edema spread throughout the entire limb and the pain increased, impairing movements (Figure 2). After eight hours, fever and headache appeared and the forearm showed ecchymotic coloration. He sought medical attention at a primary health care center, which contacted the Toxicological Information Center of Belém who provided symptomatic treatment to control the pain, because it was considered a non-venomous snakebite. The patient showed good progress with the regression of the edema and normalization of the movements of the limb in one week.

Case 2. In July 2017 a 42-year-old herpetology technician was bitten on his left hand by a *P. ofersii* snake (Figure 3) while feeding a young specimen. The accident happened at the Amazonian Herpetology Center, in the municipality of Benevides, Pará, Brazil. After the accident, he returned the snake to its enclosure, washed his hand with soap and water and continued his work at the serpentarium. Shortly afterwards he noticed a little bleeding from the wound that lasted about an hour. Twenty minutes after the bite, a mild edema appeared on the affected hand (Figure 4) and mild painful throbbing at the site was reported. Three hours later, the pain with the same intensity spread across the entire arm, lasting for two days. He noticed enlargement of the left axillary ganglions, without other systemic symptoms. The patient was treated at Toxicological Information Center in Belém, which provided symptomatic treatment to control the pain, since it was considered a non-venomous snakebite. The patient showed good progress with regression of the edema within five days.

Figure 1. *Hydrodynastes gigas* cause of the envenomation.

Figure 2. Appearance of the upper limb four hours after envenomation by *Hydrodynastes gigas*.

Figure 3. Philodryas olfersii cause of the envenomation.

Figure 4. Appearance of the hand four hours after envenomation by *Philodryas olfersii*.

DISCUSSION

Colubridae is the snake family with the largest number of species of "non-venomous" snakes. However, envenomations are poorly reported (Nishioka & Silveira, 1994; Araújo & Santos, 1997; Ribeiro et al., 1999; Correia et al., 2010; Medeiros et al., 2010). Minton (1990), in a literature review, reports at least 50 non-venomous species in the world that cause envenomation. In Brazil, there are at least five species of colubrids associated with human envenomation among which are *Drymarchon corais* (Silveira & Nishioka, 1992), *Boiruna maculata* (Santos-Costa et al., 2000), *P. olfersii* and *P. patagoniensis* (Nishioka & Silveira, 1994; Araújo & Santos, 1997; Ribeiro et al., 1999; Correia et al., 2010; Medeiros et al., 2010). The snakes in the present report are from the Dipsadinae subfamily, one of the most abundant in Brazil, with 249 species (Costa & Bérnils, 2015).

The venom of the Colubridae family is produced by the Duvernoy gland, although the secreted toxins are not well known (Kardong, 2002). While studying the chemical and enzymatic composition of the venom of Brazilian *P. olfersii, P. patagoniensis, P. nattereri, Tomodon dorsatus* and *Thamnodynastes strigatus,* Zelanis et al. (2010) detected the presence of proteins, carbohydrates and caseolytic and Phospholipase A2 activities.

Envenomations by *Philodryas* are the most commonly mentioned in Brazilian literature (Nishioka & Silveira, 1994; Araújo & Santos, 1997; Ribeiro et al., 1999; Correia et al., 2010; Medeiros et al., 2010) while this is the first report for *Hydrodynastes*.

Bites by snakes with opisthoglyphous dentition can lead to envenomation. In this report the local and systemic symptoms were present in both cases. Medeiros et al. (2010) reported 297 confirmed snakebite accidents by *P. patagoniensis* in Brazil, of which 70.4% presented local and systemic clinical manifestations while no clinical evidence was noted in 29.6%

Pain and edema were the most frequently mentioned local manifestations in the reported cases. Several authors corroborate these findings for *Philodryas* (Araújo & Santos, 1997; Correia et al., 2010; Medeiros et al., 2010) and *Hydrodynastes* species (Keyler et al., 2016). The edema was evident and remained longer in the envenomation by *H. gigas*. Keyler et al. (2016) report regression in three days in envenomations by this species while in envenomations by *Philodryas* regression can take from three (Correia et al., 2010) to ten days (Araújo & Santos, 1997).

Local bleeding was present only in the envenomation by *Philodryas*. However, a coagulogram was not performed since the patient was treated at a primary health care center. Other authors show this clinical manifestation with a normal coagulation time (Nishioka & Silveira, 1994; Araújo & Santos, 1997; Correia et al., 2010; Medeiros et al., 2010). In the *Hydrodynastes* envenomation, bruising was observed. Keyler et al. (2016) also found this clinical manifestation in envenomations by this species and Correia et al. (2010) in accidents with *Philodryas*.

Among the systemic symptoms, fever and headache were reported in the *Hydrodynastes* envenomation. Keyler et al. (2016) describe increased axillary sensitivity caused by this snakebite and adenopathy being frequent in accidents caused by *Philodryas* these are also mentioned by Araújo & Santos (1997). Medeiros et al. (2010) reported dizziness in 29.6% of the patients.

The patient received medical care at a primary health care center. The symptomatology resembles in part an accident caused by *Bothrops*. The snakes which caused the accidents were identified by one of the authors of the report as non-venomous.

The treatment was symptomatic, with drugs for pain control, recommended by the Toxicological Information Center of Belém. Nishioka & Silveira (1994), Correia et al. (2010) and Medeiros et al. (2010) refer to the unnecessary use of an anti-venom in victims of non-venomous snakes.

In conclusion, since the victims were able to identify the snakes, they avoided the use of anti-venom, however the local symptomatology of the envenomation by *Philodryas* and *Hydrodynastes* is similar to that present in accidents by *Bothrops*. It is important that victims take the animal with them to the medical care facility for diagnosis and adequate treatment.

Ethics committee approval

The study was approved by the Research Ethics Committee of the University Hospital João de Barros Barreto (CAAE: 75671917.8.0000.0017).

REFERENCES

1. Araújo ME, Santos ACMCA. Cases of human envenoming caused by *Philodryas olfersii* and *Philodryas patagoniensis* (Serpentes: Colubridae). *Rev Soc Bras Med Trop 30*: 517-519, 1997.
2. Costa HC, Bérnils RS. *Répteis brasileiros: lista de espécies 2015*. Herpetol Bras 4: 75-92, 2015. Available at: http://sbherpetologia.org.br/wp-content/uploads/2017/04/Reptilia-Brazil-Costa-B%C3%A9rnils-2015.pdf. Accesed: 07/03/2018.
3. Brasil. Ministério da Saúde. DataSus. *Acidente por animais peçonhentos - notificações registradas no Sistema de Informação de Agravos de Notificação - Sinan Net.* (Actualized 2015 Oct 2). Available at: < http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sinannet/animaisp/bases/animaisbrnet.def>. Accesed: 01/08/2017.
4. Correia JM, Neto PLS, Pinho MSS, Silva JA, Amorim MLP, Escobar JAC. Poisoning due to *Philodryas olfersii* (Lichtenstein, 1823) attended at Restauração Hospital in Recife, State of Pernambuco, Brazil: case report. *Rev Soc Bras Med Trop 43*: 336-338, 2010.
5. Hess PL, Squaiella-Baptistão CC. Toxinas animais: serpentes da família Colubridae e seus venenos. *Estud Biol Ambiente Divers 34*: 135-142, 2012.
6. Kardong KV. Colubrid snakes and Duvernoy's ''venom'' glands. *J Toxicol Toxin Reviews 21:* 1-19, 2002.
7. Keyler DE, Richards DO, Warrell DA, Weinstein SA. Local envenomation from the bite of a juvenile false water cobra (*Hydrodynastes gigas*; Dipsadidae). *Toxicon 111*: 58-61, 2016.

8. Medeiros CR, Hess PL, Nicoleti AF, Sueiro LR, Duarte MR, Almeida-Santos SM, França FOS. Bites by the colubrid snake *Philodryas patagoniensis:* A clinical and epidemiological study of 297 cases. *Toxicon 56*: 1018-1024, 2010.

9. Minton AS. Venomous bites by nonvenomous snakes: an annotated bibliography of colubrid envenomation. *Wilderness Environ Med 1*: 119-127, 1990.

10. Nishioka SA, Silveira PVP. *Philodryas patagoniensis* bite and local envenoming. *Rev Inst Med Trop São Paulo 36*: 279-281, 1994.

11. Prado-Franceschi J, Hyslop S. South American colubrid envenomations. *J Toxicol Toxin Reviews 21*: 117-158, 2002.

12. Ribeiro LA, Puorto G, Jorge MT. Bites by the colubrid snake *Philodryas olfersii*: A clinical and epidemiological study of 43 cases. *Toxicon 37*: 943-948, 1999.

13. Santos-Costa MC, Di-Bernardo M. Human envenomation by an aglyphous colubrid snake, *Liophis miliaris* (Linnaeus, 1758). *Cuad herpetol 14*: 153-154, 2000.

14. Santos-Costa MC, Outeiral AB, D'Agostini FM, Cappellari LH. Envenomation by the neotropical colubrid *Boiruna maculata* (Boulenger, 1896): a case report. *Rev Inst Med Trop São Paulo 42*: 283-286, 2000.

15. Silveira PVP, Nishioka SA. Non-venomous snake bite and snake bite without envenoming in a Brazilian teaching hospital. Analysis of 91 cases. *Rev Inst Med Trop São Paulo 34*: 499-503, 1992.

16. Vitt LJ, Caldwell KP. *Herpetology: An Introductory Biology of Amphibians and Reptiles.* Elsevier: London, 2014.

17. Zelanis A, Rocha MMT, Furtado MFD. Characterization of the venoms of five Colubridae species from Brazil. *Toxicon 55*: 666-669, 2010.