







CASE REPORT OF A CORAL SNAKE BITE (*MICRURUS IBIBOBOCA*) IN THE STATE OF PERNAMBUCO, NORTHEAST BRAZIL

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ABSTRACT: The Elapidae family comprises 35 snake species in Brazil, with *Micrurus ibiboboca* being widely distributed in the northeast of the country. Despite the high number of *Micrurus* species in Brazil, there are few cases of human envenomation in literature. This study describes a clinical report of envenomation due to the bite of *M. ibiboboca* in the State of Pernambuco, Northeast Brazil, that took place in 2017. The patient presented symptoms of muscle paralysis and sweating. He was admitted to the intensive care unit. A total of 10 ampoules of anti-elapidic serum were administered. The patient complained of local pain that extended through the arm, paresthesia in the lower limbs, headache, and chest pain. Changes in the visual, respiratory, and neurological systems were not observed. This clinical case report on coral snake poisoning is useful for increasing the knowledge on the toxicological action of snake poison and its effect on injured individuals, thereby helping in the clinical evaluation and treatment.

KEYWORDS: Snake bites. Envenomation. Elapidae. Ophidic accident. Treatment.

RELATO DE CASO DE PICADA DE COBRA CORAL (*MICRURUS IBIBOBOCA*) NO ESTADO DE PERNAMBUCO, NORDESTE DO BRASIL

RESUMO: A família Elapidae compreende 35 espécies de serpentes no Brasil, com *Micrurus ibiboboca* amplamente distribuída no Nordeste. Apesar do elevado número de espécies de *Micrurus* no Brasil, são poucos os casos de envenenamento humano na literatura. Descrevemos aqui um relato clínico de envenenamento por picada de *M. ibiboboca* no Estado de Pernambuco, Nordeste do Brasil, ocorrido em 2017. O paciente apresentava sintomas de paralisia muscular e sudorese. Ele foi internado na Unidade de Terapia Intensiva. Um total de 10 ampolas de soro anti-elapídico foi administrado. O paciente queixava-se de dor local que se estendia pelo braço, parestesia em membros inferiores, cefaleia e dor torácica. Não foram observadas alterações nos sistemas de visão, respiratório e neurológico. Este relato de caso clínico de intoxicação por cobra coral é útil para aumentar o conhecimento sobre a ação toxicológica da peçonha da serpente e seu efeito sobre os acidentados, auxiliando na avaliação clínica e no tratamento.

PALAVRAS-CHAVE: Picada de serpente. Envenenamento. Elapidae. Acidente ofídico. Tratamento

INFORME DE CASO DE MORDEDURA DE SERPIENTE CORAL (*MICRURUS IBIBOBOCA*) EN EL ESTADO DE PERNAMBUCO, NORESTE DE BRASIL

RESUMEN: La familia Elapidae comprende 35 especies de serpientes en Brasil como la *Micrurus ibiboboca* ampliamente

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distribuidas en el Noreste. A pesar de lo alto número de especies de *Micrurus* en Brasil, hay pocos casos de envenenamiento humano en la literatura. Describimos aquí un informe clínico de envenenamiento por mordedura de *M. ibiboboca* en el estado de Pernambuco, Noreste de Brasil, ocurrido en 2017. El paciente presentaba síntomas de parálisis muscular y sudoración. Fue ingresado en la unidad de cuidados intensivos. Se administraron un total de 10 ampollas de suero antielápidico. El paciente se quejaba de dolor local que se extendía por el brazo, parestesias en las extremidades inferiores, cefalea y dolor torácico. No se observaron cambios en los sistemas visual, respiratorio y neurológico. Este informe de caso clínico sobre la intoxicación por serpiente coral es útil para aumentar el conocimiento sobre la acción toxicológica del veneno de serpientes y su efecto en los individuos lesionados, ayudando así en la evaluación clínica y el tratamiento.

PALABRAS CLAVE: Mordedura de serpiente. Envenenamiento. Elapidae. Accidente ofídico. Tratamiento.

Introduction

Coral snakes are venomous snakes of the family Elapidae, presenting with fixed hollow maxillary fangs for venom injection (proteroglyph dentition) and are conspicuous red-black-white/yellow in ringed patterns in appearance (ROZE, 1996). During 2019, approximately 32,000 cases of snakebites and envenomation in humans have been reported in Brazil, of which approximately 320 (1%) were caused by elapid species (*Micrurus* or *Leptomicrurus*) (BRASIL, 2019). Comparing the behavior of coral snakes with other venomous snakes, such as pitvipers and rattlesnakes, coral snakes are generally more reclusive, flee when threatened, and do not strike, which leads to a few cases of envenomation (BUCARETCHI *et al.*, 2016; PARDAL *et al.*, 2010; SILVA-JÚNIOR, 2016). Thus, descriptions of local and systemic effects caused by envenomation of different species are important for more efficient treatments and to identify erroneous diagnoses, such as false-coral snake bites (BUCARETCHI *et al.*, 2016; CASAIS-E-SILVA; BRAZIL, 2009). In a review of *Micrurus* snakebites in Brazil, between 1867 and 2014, 150 cases were reported, of which 21 in the Northeast region, 19 in Bahia, and one in Pernambuco and Paraíba States (BUCARETCHI *et al.*, 2016).

In general, the venom of *Micrurus* species is neurotoxic, myotoxic, nephrotoxic, hemorrhagic, and edematogenic. Moreover, neuromuscular blockade is a systemic hallmark of envenoming by coral snakes (JORGE-DA-SILVA; BUCARETCHI, 2003; SILVA-JÚNIOR, 2016). Therefore, envenomation by coral snakes in humans should be considered serious, and knowledge of clinical reports with different species is important for future treatments.

Of the 81 species described, it arises from the south of North America to the south of South America. In Brazil, there are 35 species of coral snakes, three *Leptomicrurus* spp., 32 *Micrurus* spp., 5, and *M. corallinus*, *M. ibiboboca*, *M. lemniscatus*, and *M. potyguara* occur in the Pernambuco State of Northeast Brazil (NOGUEIRA *et al.*, 2019; SILVA-JÚNIOR, 2016). The species *M. ibiboboca* is widely distributed and extensively found in Northeastern Brazil, occupying coastal and interior environments, such as ombrophilous forests to deciduous seasonal forests (BARBOSA *et al.*, 2019; FILHO *et al.*, 2017; FRANÇA; FRANÇA, 2019). *M. ibiboboca* is a medium-sized snake that reaches 1,470 mm, feeds on other snakes and amphisbaenians, and presents fossorial or cryptozoic habits being active during the day and night (BARBOSA *et al.*, 2019; FILHO *et al.*, 2017; SILVA-JÚNIOR, 2016). When

threatened, the species flee, make erratic movements, or hide the head under the body lifting the tail, and bite only as a last defensive behavior (PARDAL *et al.*, 2010; SANZ *et al.*, 2016). Here we describe a clinical report of envenoming by *M. ibiboboca* in Pernambuco, Northeast Brazil.

Case report

On October 17, 2017, at 7:00 am, in Timbaúba municipality, Pernambuco, northeast Brazil (7°30' 14.1" S/35°18' 45.6" W), a 60-year-old man, 70 kg and 1.70 m tall was bitten by a *M. ibiboboca* (Figure 1) 300 mm total length. The man engaged in agricultural activities, and when he was tying up the cattle for grazing, he placed his hand in a thicket of grass where he was bitten between the index and middle fingers of the right hand. The coral snake held the bite for approximately five s. Immediately, symptoms of muscle paralysis and sweating began. The man arrived at his residence within two minutes after the snakebite spot, and he ingested fresh garlic in an attempt to revert the symptoms of the elapidic accident, following a popular belief in the region.

Figure 1. Specimen of *Micrurus ibiboboca*



At 8:00 am, the man was rescued and admitted at 8.10 am to the Emergency Unit (UPA) closest to his residence and was administered fluid therapy after admission (8.15 am). After the first line of treatment, the man was sent to the Hospital of Restauração (HR) Governador Paulo Guerra, located in Recife, at 10:40 am. In the hospital, he was sent to the red room of the Intensive Treatment Unit (ITU or UTI), reporting local pain associated with irradiation of the hand to the entire right arm and paresthesia in the lower limbs. In addition, headache and chest pain started four hours

after the bite but without difficulty in urinating. Changes in visual ability, respiratory, and neurological systems were not observed. The patient was an alcoholic and a smoker in the past and had no previous comorbidities. He also underwent treatment with antiophidic serum in the UTI under the guidance of the Toxicological Assistance Center (CEATOX), with the administration of 10 ampules of anti-elapidic antivenom. Laboratory examinations (blood count and biochemistry) were performed 7 h after the accident that did not show any changes. However, when the examination was repeated on the following days, thrombocytopenia and a significant rise in creatine phosphokinase (CPK) in the first three days of hospitalization was noted. A decline in CPK from the fifth day was observed, and normalization of CPK was done on the thirteenth day (Table 1).

Table 1. Rates of Creatine Phosphokinase (CPK) from exams performed during the treatment. When the levels of CPK dropped out, the exams were not performed every day.

Day	Serum Biochemistry	CPK
October 17	94 U/L	-
October 18	>1.600 U/L	High
October 19	5.757 U/L	High
October 20	>1.600 U/L	High
October 21	2.880 U/L	High
October 22	1.441 U/L	High
October 23	843 U/L	High
October 27	107 U/L	-
October 30	32 U/L	-

The patient remained clinically stable with progressive improvement of pain and edema symptoms at the site of the bite from the third day of treatment initiation. However, the patient still presented with isolated feverish peaks during the day, without other symptoms. Three days after administering the anti-ophidic serum, the patient still had difficulty in moving. He presented with an increase in micturition due to urinary infection but without alterations in the urine summary. The patient also mentioned an intermittent pain in his right calf, without swelling, edema, or hyperemia, a few days before the accident. A MID Doppler Ultrasonography was performed, which confirmed deep vein thrombosis (DVT) in the soleal veins.

With the patient clinically stable, cultures were harvested, DVT was treated, and fever and signs of infection were monitored. During hospitalization, normocytic/normochromic anemia was observed on laboratory examinations. Tests of iron kinetics, vitamin B12 kinetics, folic acid kinetics, screening colonoscopy, and upper gastrointestinal (UGI) endoscopy showed no changes. He also had a urinary tract infection, which was treated with ciprofloxacin. The patient remained clinically stable, with good diet acceptance, had normal CPK and improved renal function, and a hemoglobin level of 10.4 g/dL (November 11, 2017). The patient was discharged on November 16, 2017 (30 days after the accident, pointing out

that there were other complications unrelated to the snakebite) in a good clinical condition and with guidelines for outpatient treatment.

Discussion

In other reports of human envenomation by *M. ibiboboca*, *M. lemniscatus*, *M. corallinus*, *M. brasiliensis*, and *M. frontalis*, the patients also presented with symptoms of headaches, local and chest pain, and the absence of difficulty in micturition, as reported in this study (CASAIS-E-SILVA; BRAZIL, 2009; CASTRO *et al.*, 2015). In some clinical cases, patients who did not present with neurological changes presented with myalgia proven by the increase in CPK (CASTRO *et al.*, 2015), as observed in this case report. The rapid onset of symptoms can be related to neurotoxins having low molecular weight, with high absorption by the body (OLIVEIRA; NORONHA; LOZANO, 2017). Regarding local pain, Bucarechi *et al.* (2016) a review of accidents by *Micrurus* spp. that this is the most common symptom, and in accidents with other species of coral snakes, intense local pain was reported in a child bitten by *M. averyi* (SILVA *et al.*, 2018), young man bitten by *M. lemniscatus helleri* (MANOK *et al.*, 2018), and young man bitten by *M. filiformis* (PARDAL *et al.*, 2010). Here, the patient had severe local pain that radiated through the entire bite site.

The number of cases of coral snake bites recorded in Brazil is underestimated, especially in the Northeast region, where in 147 years only 22 cases have been reported (BUCARETCHI *et al.*, 2016; CASAIS-E-SILVA; BRAZIL, 2009; LIRA-DA-SILVA *et al.*, 2009). Most of these bites were on the hands and feet, mainly on the fingers (BUCARETCHI *et al.*, 2016; CASAIS-E-SILVA; BRAZIL, 2009; CASTRO *et al.*, 2015). Accidents can occur because of a fortuitous encounter with the coral snake and an attempt to manipulate it without knowledge and adequate protection (e. g., gloves, leggings, high boots, etc.) in the field (OLIVEIRA; NORONHA; LOZANO, 2017). In Brazil, many non-venomous species, such as false-coral snakes and false-vipers, can be easily confused with venomous species, and some people attempt handling them because of erroneous identification that leads to an accident (BARBOSA *et al.*, 2020; STRAUCH *et al.*, 2018).

Conclusion

Accidents with coral snakes can be extremely dangerous, leading to an irreversible damage to the victim until death. Therefore, this clinical case report of coral snake poisoning is useful for increasing the knowledge of the toxicological actions of the snake poison and its effect on injured individuals that will help in clinical evaluation and treatment. We reinforce the precaution and care that people need when finding a snake, mainly one with a coral snake pattern. Workers in agricultural areas should be aware that they have worn appropriate clothing and should never handle any snake species. Finally, if an accident occurs, the victim should go to a medical care as soon as possible.

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