Adam & Jafar
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Case Report

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Suspected Neurotoxic Envenomation in a 5-year-old Child: A Syndromic Approach.

Hassan **ADAM*** and Jamal **JAFAR**

Abstract

Snakebite envenomation remains a significant cause of morbidity and mortality in Southeast Asia. Accurate identification of the snake species or even confirming biting incident can be challenging, especially in children. This case report discussed the essential considerations for a suspected snakebite in a paediatric patient who presented to the emergency department with progressive neurological signs consistent with envenomation, necessitating empiric antivenom administration and mechanical ventilation. It highlights the diagnostic and therapeutic challenges encountered, emphasising the critical need for prompt identification of envenomation, judicious use of empirical antivenom therapy, and comprehensive supportive critical care. Urgent and effective interventions, including ventilatory support have been demonstrated to enhance outcomes in severe neurotoxic envenomation cases.

Keywords: Snakebite; Malayan Krait; Neurotoxicity; Antivenom; Paediatric Emergency; Envenomation.

Author Details:
Department of Accident and Emergency, Raja Isteri Pengiran Anak Saleha Hospital, Jalan Putera Al-Muhtadee Billah, Bandar Seri Begawan, BA1712, Brunei Darussalam

***Correspondence:**
Hassan ADAM
Hassan.adam@moh.gov.bn

INTRODUCTION

Each year, snakebite with envenomation is responsible for estimated 80,000 to 140,000 global fatalities. At least twice that number result in debilitating morbidities, with the Southeast Asian nations experiencing a disproportionately high incidence.[1,2]

The impact is particularly severe in the paediatric population, where physiological differences can lead to more rapid and exacerbated effects from venom compared to adults.[3] This increased vulnerability necessitates a heightened clinical suspicion and a streamlined

protocol for immediate management, as delayed intervention can lead to irreversible neurological deficits or even fatality if unrecognised.[4] In cases of neurotoxic envenomation, rapid onset of respiratory compromise often mandates mechanical ventilation and aggressive supportive care.[5]

This case report details a case of an unidentified neurotoxic snakebite in a paediatric patient, where a high index of suspicion, timely anti-venom administration, intubation, and mechanical ventilation were critical.

CASE REPORT

A 5-year-old boy presented to the Emergency Department (ED) with generalised weakness, as noted by his family. He had been playing in front of their home that morning. By early noon, he was observed to be very weak, though there were no other reported complaints, nor any history of a sting, bite, or pain.

Upon arrival at the ED, he was lethargic but remained fully alert. He was afebrile, and haemodynamically stable. Initial assessments revealed subtle neurological manifestations, primarily mild bilateral ptosis, which prompted further evaluation. A thorough head-to-toe examination identified a set of small, faint adjacent marks on the dorsum of his right foot. Although initially deemed insignificant, these marks raised suspicion of a snakebite, which led to intense focused neurological examination and the clinical history was revisited in more detail with the father. He recalled that he was playing with his siblings on and around a pile of wood in front of their house where he was likely to have been bitten or stung.

Based on the clinical presentation and subtle neurological signs, a presumptive diagnosis of neurotoxic snake envenomation was established, despite the absence of a witnessed bite or definitive snake identification.

Shortly after the initial assessment, the patient's condition rapidly deteriorated, exhibiting progressive bulbar palsy like features, started with drooling and progressed to impending airway compromise. This necessitated immediate intubation and mechanical ventilation.

Immediate intravenous infusion of neuropolyvalent antivenin (30 mls of reconstituted antivenom over 60 minutes, a total of three vials of Purified polyvalent equine immunoglobulins- produced by: Queen Saovabha Memorial Institute, Thailand) was administered. A few minutes after initiation of the anti-venom infusion, he developed generalised urticarial rashes. Consequently, the infusion was temporarily paused, and intravenous chlorpheniramine and hydrocortisone were given, after which the antivenom infusion was resumed and completed without any further reaction.

He was subsequently admitted to the paediatric intensive care unit for continuous monitoring and further management. He was extubated six hours later and two days later was stepped down to the general paediatric ward. By the third day of hospitalisation, he was discharged with a full recovery and normal laboratory investigations.

A follow-up examination in the paediatric clinic conducted six days after discharge revealed a mild bruise on the dorsum of his right foot, with no residual neurological deficits.

DISCUSSION

This case highlights that given the swift progression of neurotoxic symptoms and our patient's age, prompt clinical decision to administer antivenom, despite the lack of specific snake identification proved to be vital. This syndromic approach involves recognition of the constellation of symptoms and signs suggestive of envenomation and providing immediate treatment based on the severity of the case presentation. This concept is crucially important among paediatric and incapacitated victims.

This aggressive approach aligns with established guidelines for managing suspected severe envenomation in children, where early intervention can significantly improve outcomes and reduce the likelihood of long-term sequelae.[6]

The efficacy of antivenom in neutralising circulating toxins is well-established. Emphasising the importance of timely administration to prevent further neurological deterioration, systemic impact, and delayed complications.[7] Furthermore, the necessity for intubation and ventilation highlighted the severity of the envenomation and the rapid progression to respiratory paralysis, which is a common and life-threatening complication of neurotoxic snakebites.[8]

The rapid clinical deterioration observed in this case, is consistent with the well-documented neurotoxic effects of several venomous snake species prevalent in the region, such as kraits (**Figure 1a**) and cobras (**Figure 1b**).[9] Krait bites, in particular, is more likely because it is often less noticeable due to their short, thin

Figure 1: a) *Bungarus candidus*, commonly known as the Malayan krait or blue krait, is an extremely venomous species of snake. It is a member of the genus *Bungarus* and the family *Elapidae*. (Source; Wikipedia: https://en.wikipedia.org/wiki/Bungarus_candidus [accessed 10 October 2025]). It is native to Southeast Asia, known for it is banded black/bluish-black and white pattern. It has a ***potent neurotoxic*** venom that causes paralysis (often fatal without antivenom) after a bite with no or little pain, and **b)** The **king cobra** (***Ophiophagus hannah***) is a species complex of snakes endemic to Asia (Source: https://en.wikipedia.org/wiki/King_cobra [accessed 10 October 2025])

fangs, which can lead to delayed presentation and diagnosis.[10]

The successful management of this case has demonstrated the critical role of maintaining a high index of suspicion for potential envenomation, thus providing immediate, aggressive supportive care concurrently with antivenom administration to counteract the venom's effects. This approach is particularly vital given the heightened susceptibility of paediatric patients to venom-induced respiratory compromise.[11]

CONCLUSION

This case emphasises the critical need for rapid diagnosis and aggressive interventional strategies, including early antivenom administration and advanced airway management, to mitigate severe outcomes of neurotoxic snakebite envenomation. Additionally, the subtle and often unrecognised presentation of neurotoxic effects in children, such as respiratory compromise rather than seizures, can further complicate initial assessment and delay critical interventions.

Take Home Message

- While antivenom is the cornerstone of treatment, supportive measures, including airway management and ventilatory support, are equally critical.
- Given the challenges in identifying snake species at the point of care, clinical reliance on high index of suspicion combined with syndromic management approach for neurotoxic envenomation becomes essential.
- This approach necessitates continuous education and awareness campaigns to enhance potentially harmful bites and stings recognition, thereby reducing the time to definitive medical care.

Abbreviations

ED Emergency Department

Declarations

Patient Consent

Patient consent has been obtained.

Disclosure and Conflict of Interest

The authors declare that they have no conflicts of interest and no financial disclosures relevant to this case report.

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None

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