

Case Report

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Scorpion sting complicated by ischemic stroke in a child

Najwa Imad*; *Jawhara El Himer; Soumia Mghar; Karima El Fakiri; Nouredine Rada; Ghizlane draiss; Mohammed Bouskraoui*
 Department of Pediatrics A, Mother and Child Hospital, University Hospital Mohammed VI of Marrakech, Morocco.

*Corresponding Author: Najwa Imad

Department of Pediatrics A, Mother and Child Hospital, University Hospital Mohammed VI of Marrakech, Morocco.

Email: najwa.imad24@gmail.com

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Abstract

Scorpionic envenomations (SE) are a public health problem, especially in Morocco where they rank first, causing high morbidity and mortality. The presence of neurological signs marks the seriousness of this envenomation especially in the pediatric population, which remains more vulnerable to these intoxications. We present the rare observation of a child hospitalized in July 2022 in the pediatric department A of the CHU Mohammed VI of Marrakech, Morocco, for a stroke complicating a scorpion sting.

Keywords: Scorpion sting; Complication; Stroke.

Introduction

Scorpion envenomation (SE) is a relatively frequent accident in tropical and subtropical areas and is a major public health problem, particularly in South and Central America, North Africa, the Middle East and India [1]. In Morocco, according to epidemiological data published by the Moroccan Poison and Pharmacovigilance Centre, scorpion stings are the most common form of poisoning (30-50%) [2]. The severity of this envenomation is more marked in children, with 90% of deaths occurring in children under 15 years of age [2]. Morocco has developed a national strategy to combat scorpion poisoning for all regions of Morocco, in order to reduce the morbidity and mortality caused by this intoxication [3].

Case report

We present the observation of the child A.Z, male, 8 years old, with no particular pathological history. The child was stung by a scorpion, complicated by stage III cardiogenic shock with tachycardia and hypotension, for which he was hospitalised in a paediatric intensive care unit, where he received a Dobutamine infusion at a dose of 15 µg/kg/min for 48 hours and then progressive degeneration, the patient presented a good clinical evolution with stability of his haemodynamic state and transfer to a paediatric hospitalization unit. After 4 days, the child presented

cardiac rhythm disorders, consciousness disorders, aphasia, as well as a right-sided hemiplegia, of sudden onset and evolving in a context of fever of 38° and alteration of his general state with asthenia. The decline of his clinical condition motivated his transfer to our institution after hemodynamic stabilization, the child was unable to stand and walk, muscle strength was diminished on the right side, estimated at 1/5, it was preserved on the left side. Osteotendinous reflexes were abolished on the right side, with indifferent cutaneous-plantar reflexes, a right facial paralysis.

A cerebral CT scan with contrast injection was performed and found an ischaemic stroke in the territory of the left middle cerebral artery, with individualisation of a patch of cortico-subcortical hypodensity, systematised fronto-parieto-temporal on the left side, suppressing the cortical sulci and the homolateral basal ganglia in front of it, with a mass effect on the homolateral lateral ventricle without any subfalcular herniation (Figures 1,2).

An echocardiogram and supra-aortic trunks, with an EKG were conducted, which came back with no abnormalities. A complementary biological work-up was ordered which showed a haemoglobin level of 12.5, platelets 281000, and leucocytes 7940, the prothrombin level was 100% with an INR of 0.87, and an ACT of 18.8s, the D-dimer and fibrinogen levels were

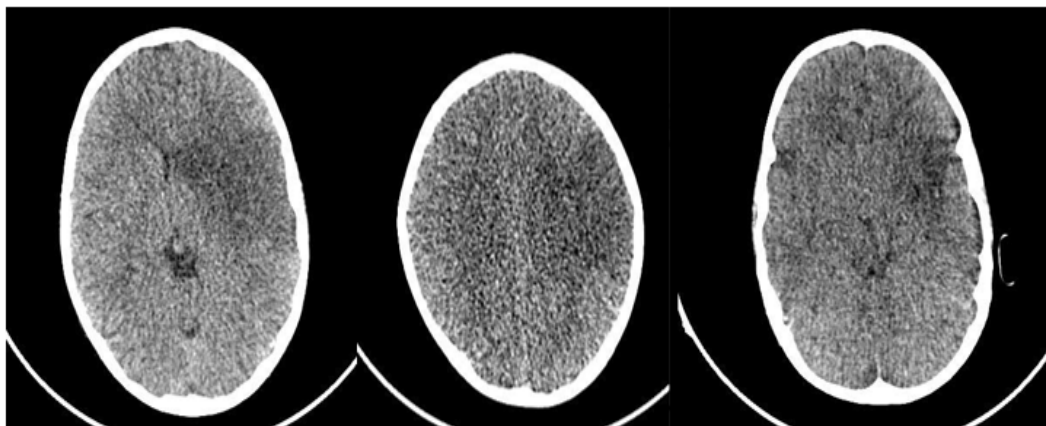


Figure 1: Cerebral scan without contrast injection, axial sections: left fronto-parieto-temporal, cortico-subcortical and systematized hypodensity area, producing a discrete mass effect on the homolateral lateral ventricle, without detectable subfalcine involvement.

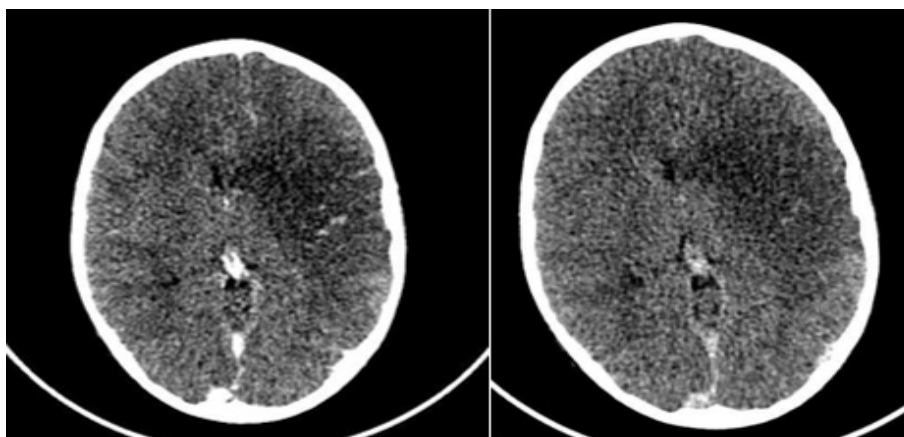


Figure 2: Brain scan after contrast injection: venous and late time, axial slices: no contrast of the hypodensity range.

increased to 1.71 ug/ml and 4.6 g/l respectively. SV was 64/90 mm, ferritin was 145. An immunological assessment was also requested which found negative NAA, negative ANCA p/c, with normal C3 and C4 complement levels at 2 and 0.37 g/l respectively. We ruled out any other cause that could explain the stroke. The evolution was marked by an improvement of the patient's neurological state, with functional recovery and gain of autonomy, owing to motor physiotherapy sessions.

Discussion

Scorpion envenomation is a potentially fatal public health problem in tropical and subtropical regions of the world. A large global population, nearly 2.5 billion people, is at risk of scorpion stings. Each year, more than 1.2 million people are stung by scorpions, resulting in the death of at least 3,250 people worldwide [4].

The national strategy in Morocco to combat scorpion poisoning has been able to reduce the morbidity and mortality caused by this intoxication. The components of this strategy are based on the training of medical and paramedical staff and the standardisation of the actions to be taken when faced with a scorpion sting, Information, Education and Communication (IEC) activities for the population, the use of scorpion predators to reduce the number of stings, and the implementation of an information system to monitor the evolution of the various morbidity and mortality indicators [1,3].

Children represent the largest number of hospitalized and stung victims. Most scorpion stings in children occur during play (50%) and sleep (33%) [5]. The most common reason for the high mortality in these children is the delay in treatment. Children who received treatment after six hours of stinging are at high risk of complications and death [6].

Scorpions are one of the most venomous animals, found mainly in the hot, dry climate of tropical and subtropical regions. There are about 1,500 species of scorpions, 30 of which are dangerous to humans [4]. They can sting with or without venom inoculation, which results in a wide range of clinical manifestations [4]. The main active components of dangerous scorpion venom are neurotoxic peptides. This venom activates sodium and calcium channels in the neuromuscular system. The main mechanism of action of scorpion venom toxins involves the release of endogenous acetylcholine and catecholamines (autonomic storm) by acting on ion channels. It causes transient cholinergic symptoms such as vomiting, abdominal colic, diarrhoea, incontinence, profuse sweating, piloerection and priapism. These symptoms are followed by late and long-lasting adrenergic effects such as hypertension, shock, tachyarrhythmia and bradyarrhythmia, signs of myocarditis and pulmonary oedema [4,6].

Scorpion sting envenomation in children is a life-threatening emergency that can result in severe neurological, cardiac and

respiratory damage, anaphylactic shock and death. The main factors associated with the poor prognosis of scorpion sting envenomation in children are the presence of metabolic acidosis, myocarditis, priapism, encephalopathy and acute pulmonary oedema [7].

SE is classified into 3 classes, the presence of neurological signs with cardiovascular failure, found in our patient, classifies the envenomation as stage 3 in severity [1], Central nervous system complications are rare and represent only 2% of all complications [8,9].

Stroke is one of these rare complications, and there are several mechanisms that explain the occurrence of brain damage from scorpion stings. Catecholamines released by stimulation of the hypothalamus cause sympathetic and parasympathetic effects. Vasospasm leads to hypertension and systemic hypoperfusion. High blood pressure can rupture vessels and cause haemorrhagic infarction. Systemic toxicity may cause myocarditis leading to blood stasis in the heart and subsequent thromboembolism [10], in our patient the haemodynamic instability, with cardiogenic shock, resulting in hypotension with vasospasm may explain the ischaemic stroke that occurred.

Conclusion

Worldwide, scorpionism is a real public health concern of worrying magnitude in many countries. Deaths could be prevented by adequate awareness, safety measures and prompt and early treatment.

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