



Clinical severity of scorpion envenomation in children: a review of two observations.

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Introduction

scorpion bites represent a major public health problem in many countries, particularly in North Africa and Sahelian Africa. In Algeria, scorpion envenomation is a tangible problem due to the morbidity and mortality it induces.

The neurotoxic and cardiotoxic effects of the two common species in Algeria *Androctonus australis hector* and *buthus occitanus*, determine the severity of the clinical signs.

The objective of the work is to determine the clinical characteristics of scorpion envenomation in children admitted to pediatric intensive care at the Oran University Hospital Establishment November 1st during the year 2017-2018.

Materials-methods:

The authors report two clinical observations of scorpion envenomation in two young boys, which produced a severe clinical signs with acute pulmonary edema of cardiogenic origin.

Observation

first observation: A 7-year-old boy from the southern Sahara was stung by a scorpion on his right foot in August 2017. He was admitted 4 hours later in his hometown hospital for grade 2 envenomation and convulsions; he receives antiscorpionic serum, a solumedrol-type corticosteroid, and an Aspégic-type antipyretic and a benzodiazepines (for his state of agitation). The development was marked by the installation of respiratory distress motivating his transfer to pediatric intensive care at the university hospital in Oran November 1, Oran 25 hours after the envenomation.

On admission: BP = 74/43 mm Hg, HR = 169 beats / min, the filling pressures measured on ultrasound were increased, polypnea with a respiratory rate of 37cycles / min. The child presented with perioral cyanosis, the spio2 in ambient air was 75%. Lung auscultation found diffuse crackling rattles in both lung fields. The child is also in stage II coma, feverish with a core temperature of 40 ° C.

Telethorax shows bilateral pulmonary overload images, and the ECG shows ST segment deposition in all leads.

Biochemistry finds: a glycemia at 2.37g / l, a prothrombin rate = 65%, a natremia at 132 meq / l, a Kalemia at 3.71meq / l. The CBC shows hyperleukocytosis at 13,000 / mm³.

The child was intubated, ventilated, sedated with benzodiazepines; a PEEP at 5 cmH20 was added after a saline vascular filling guided by the measurement of the filling pressures on ultrasound. 'evolution was marked by the occurrence of O2 successive cardiac arrests after 20 minutes of his admission. The child dies at H4 from hospitalization.

Observation n ° 2: A 12-year-old teenager from southern Algeria was stung by a yellow scorpion on his upper lip in September 2018. He was received by a resuscitator at the hospital in his hometown 3

hours after the bite. The examination at their level shows: SBP = 70mm / Hg, abdominal pain, the extremities are cold, bronchial congestion with hypersalivation, glasgow at 11/15, with crackling pulmonary rales, an 80% Spio2, motivating his transfer to the pediatric intensive care unit at EHU Oran.

On arrival in pediatric intensive care unit , 12 hours after envenomation; the clinical examination finds:

Blood pressure at 84/47 mm Hg, heart rate at 136 b / min, superficial polypnea at 52 c / min with cyanosis of the extremities and Spio2 at 79%. Pulmonary auscultation finds crackling rales in both fields, The central temperature is at 37 ° 3, a diuresis at 200cc on probing. Moreover the child is obsessed, reactive, and presents a priapism. A cardiac ultrasound finds an ejection fraction at 47%, the filling pressures are increased. The telethorax shows bilateral opacities confluent at the lower 2/3 of the pulmonary fields

The blood gases find a Pao2 / Fio2 ratio = 310. The biochemical examination objective: an increase in CPK and LDH, leukocytosis at 10400 mm³, anemia with hemoglobinemia at 10g / l, prothrombin level at 52%, glycemia = 1.86 g / l. Natremia and serum potassium are normal.

The child was put into mechanical ventilation, sedated with benzodiazepines maintained under hemodynamic support such as dobutamine at 10 microgram / kg / min in a self-propelled syringe. Vitamin K therapy at 0.1 mg / kg and antibiotic therapy with 3rd generation cephalosporin have completed the conduct of treatment.

The evolution was marked on day 1 by a stability of the mean arterial pressure between 70-75mmHg, a spio2 = 96% under Fio2 = 25%. The control echocardioc found a global hypokinesia of the Left Ventricular at 49%, , a dilated OG, a PAPS = 12cm H2O, a dry pericardium.

The Child is extubated on day 4, weaned from support on day 5 of hospitalization. PAM = 100mmHg, FR = 22c / min. The cardiac ultrasound on day 4 finds a Systolic Ejection Fraction at 54%, then at 70% on day 6. The child is discharged on day 8 of his hospitalization.

Discussion:

scorpion envenomation is a real public health problem in Algeria due to its morbidity and mortality. Nearly 1,500 species of scorpions are described throughout the world [1], only a few of which are dangerous to humans. [2] Of these two are endemic to Algeria. They are responsible for high morbidity and mortality: *Androctonus australis* is a large brown scorpion that can reach up to 10 cm, some parts of which are darker (the pincers and the last rings of the tail), its tail is thick. It is the most dangerous species, its venom is powerful and contains 6 toxins. *Buthus occitanus* is a scorpion of medium size (4 to 7cm), of light color, the claws and the legs are lighter and its tail is hail. The toxins identified are 13 in number. Its distribution area is extensive and its dangerousness is variable.

Each year in Algeria there are on average 30,000 to 50,000 bites / year and just under a hundred deaths / year. Among them, it is school-age children who bear the brunt of scorpion envenomation; they represent 50% of all deaths [3]

The factors of severity of the bite in humans depend on the species in question (in Algeria, the most dangerous species is *Androctonus australis* hector), the size of the scorpion (low risk if less than 3 cm), its nutrition, the quantity of venom injected, its route of introduction, the age of the person bitten and finally the time taken to take charge (significant severity for a time greater than 2:30. it is 4 hours for our 1st patient).

The toxins of the venom have a direct cardiotoxic action on the one hand and indirect through the effect of catecholamines on the myocardium on the other hand. These catecholamines are secreted by peripheral nervous action of the venom [3] These toxins are present in the majority toxic fraction isolated by molecular filtration from the venom of *Androctonus australis* hector) [4].

Clinical symptoms [5] The clinical manifestations observed are divided into three classes: Class 1: Benign sting Isolated local signs are observed, such as: Pain of varying intensity at the point of sting Tingling Paresthesias or burns which may be accompanied by numbness sometimes triggered by percussion or touch (Tap test positive).

Class 2: Moderate envenomation In addition to local signs, which may be more marked, there are systemic manifestations revealing autonomic dysfunction and one or more symptoms that may be related to one of the syndromes that scorpion envenomation can induce.

Class 3: Severe venom The general signs are increased. A failure is associated with it: Respiratory: respiratory failure determines the severity of the initial picture And / or Cardiovascular: arterial hypertension is rare in our patients. On the other hand, rhythm disturbances, whatever the type, can be found and / or central neurological: the clinical manifestations are varied and range from myoclonus to coma.

from a physiopathological point of view: scorpion envenomation leads to an increase in capillary permeability responsible for pulmonary edema of hemodynamic origin

the addict may present with bronchial spasms with stridor, bronchial hypersecretion and severe pulmonary edema with cyanosis. Like the case of our 2 patients. Abroug [6] describes a series of 5 patients who presented respiratory distress with pulmonary edema associated with dysfunction.

left ventricular from a scorpion sting; probably *Androctonus Australis* Hector.

Our patient had signs of heart failure with repolarization disturbances and on echocardiography the Left Ventricle was hypokinetic dilated with high filling pressure. The pathogenesis of this cardiac dysfunction is still unclear. It is thought to be secondary to catecholamine discharge secondary to envenomation [7].

The short-term vital prognosis of patients in this class may be compromised. This is especially true if the following clinical manifestations are found. They are considered to predict worsening: hyperthermia, bradycardia, priapism, hyperglycemia > 2g / l, vital function disorders. Their association with factors such as severe neurological signs, age, site of the bite, the presence of debilitating pathologies, the time to treatment and finally the species and size of the scorpion are all important elements. vigilance.

There is no preventive treatment for complications. The only specific treatment currently used is the administration of an antiscorpionic serum made up of fragments of F (ab ') 2 and Fab immunoglobulins [8].

Conclusion:

Despite the efforts made, scorpion envenomation in Algeria remains a concern and a public health problem. therapy must focus on improving the quality of therapeutic management which will be based on symptomatic and pathophysiological approaches.

The use of antiscorpion serum should be more rational and thoughtful, and not routinely prescribed to any patient who presents within six hours of the injection.

Conflict of interest: the authors declare that they have no conflict of interest.

Références :

- 1-STOCKMANN R. GOYFFON M. Animaux venimeux actifs. Les scorpions. Masson 1994.
- 2 - GENTILINI M..Animaux venimeux terrestres.Encyclopédie médico-chirurgicale, intoxication. 1990, 16078, A. 10
- 3-BENGUEDDA, LARABA DJEBBARI *Bull Soc Pathol Exot*, 2002, 95, 3, 205-208

- 4-LARABA-DJEBARI F , HAMMOUDI D - Utilisation de la fraction toxique majoritaire isolée à partir du venin de scorpion *Androctonus australis hector* d'Algérie dans la valorisation du sérum anti-scorpionique. *Arch Inst Pasteur d'Algérie*, 1998, 62, 254 - 266 .
- 5-Khattabi A, Soulaymani-Bencheikh R, Achour S, et al (2011) Classification of clinical consequences of scorpion stings: consensus development *Trans R Soc Trop Med Hyg* 105(7):364–9. Epub 2011 May 23
- 5-ABROUG F., BOUJDARIA R., BELGHITH M. ET AL. Cardiac dysfunction and pulmonary oedema following scorpion envenimation. *Chest*, 1991, 100, 4: 1057-1059.
- 6- GUERON M., ADOLPH RJ, GRUPP L. Hemodynamic and myocardial consequences of scorpion venom. *Am. J. Cardiol.*, 1980, 45 : 979-86.
- 7- PEPIN - COVATTA S. Immunoreactivity and pharmacokinetics of horse anti-scorpion venom F(ab')₂-scorpion venom interactions. *Toxicol Appl Pharmacol*, 1996, 146, 272 - 277.
- 8-DEHESA-DAVILA M , POSSANI LD - Scorpionism and serotherapy in Mexico. *Toxicon*, 1994, 32, 1015-1018.

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