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Case report

Scorpion sting induced Myocarditis, Hyperpyrexia and convulsion: - A Case report

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Abstract.

Background: Scorpion envenomation is a public health problem especially in tropical and sub-tropical regions where it is considered as one of the important health challenges. It is life threatening condition more in paediatric age groups.

Case report: This is a case report of 7-year-old Eritrean male child come with complaint of scorpion sting to Tesseney Hospital, Eritrea in December 20, 2020. His family reported that the child started to have severe pain, restlessness, profuse sweating and drooling with in fifteen minutes of scorpion sting. He was vigorously crying with abnormal body movement during admission to emergency. In emergency department he was treated with local infiltration lidocaine, diazepam and frequent suctioning. Electrocardiogram result showed mild ST elevation in V5 and V6 with T wave inversion in V4 and V5. Later he develops hyperpyrexia which is intractable to antipyretics and cold compression. Though scorpion anti-venom, nifedipine, local lidocane infiltration and other supportive managements, his condition deteriorates with time and collapsed after 22 hours of stay in hospital.

Conclusion: Scorpion envenomation can be associated with very fatal complications that needs urgent management. Physicians and communities should be aware about the debilitating complications fatal outcomes. Availability of scorpion anti-venom, alpha-1 blocker (prozasin) in hospitals is essential as they are required urgently and vital in such cases.

Key words: Scorpion sting, hyperpyrexia, myocarditis, Eritrea

Background

Scorpion envenomation is a public health problem, common in certain areas of the world including Middle East, Latin America, Asia and Africa. In tropical and sub-tropical regions, scorpion stings are considered one of the most important health challenges. (4) In 2018, WHO reported that the truth of scorpion sting envenoming is not known because many cases do not seek medical attention and envenoming accidents occur in villages of tropical and subtropical countries, it has been estimated that there are approximately 1.23 million stings per year. (9) Scientists are very keen on treating, reporting and studying the snake bite than scorpion envenoming. (4, 7) Scorpion sting is ignored because of unknown prevalence and high number of low income countries. (1)

Scorpion sting is a dreadful medical emergency, more in paediatric victims because of their smaller body size. The first symptom of scorpion envenoming is localized pain, which reflects the penetration of the venom and is a valuable warning signal, especially in children. (3) It is present in more than 95% of cases of envenoming and may be associated with oedema and erythema (20%), more rarely small blisters. (5) Initial parasympathetic excitation is characterized by vomiting once or twice, profuse sweating (skin diarrhoea for 3–17 hours), ice cold extremities, hyper salivation and thick mucus secretion due to stimulation of bronchial mucus glands. (2) Lacrimation, pin-point pupils, diarrhoea, abdominal distension, priapism, bradycardia and hypotension are common manifestation of patients with scorpion sting. (2) Irritability and agitation are also common features and patients can hurt themselves during this stage. (6)

Morbidity and mortality due to scorpion sting are related to acute pulmonary oedema, cardiogenic shock, and multiorgan failure. (2) In 2012 there was case report of scorpion bite induced myocardial damage and pulmonary oedema presented with shortness of breath and chest pain. (1) She had not predisposing cardiac risk factors and cardiac enzymes were increased with sinus tachycardia and ST-T changes on electrocardiography. (1)

Based on our hospitals demographic data and clinical observation, scorpion related hospital admissions and increasing fatal outcome was becoming a challenge to health workers and worrying to communities in western lowland of Eritrea in Tesseney subzone.

Case report

This 7-years old Eritrean child was brought to emergency department of Tesseney Hospital, in Gash Barka, Eritrea in December 20, 2020 by his family with complaint of severe pain, restlessness, profuse sweating and drooling with in fifteen minutes of scorpion sting. The bite was

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on his right hand and had one episode of vomiting of ingested material at home. Family killed and brought the scorpion to the hospital. (See pic 1) His parent denies any history fever, cough, and fall down accident or any chronic illnesses. He has no history of haematuria, hematemesis, and abdominal pain. During his arrival to emergency, the child was restless, on severe generalized pain, vigorously crying followed by abnormal body movement and twitching of face. Generally he was diaphoretic with vital signs of blood pressure 100/50 mmHg in right arm with appropriate cuff size, with regular and faint pulse rate of 84beats/min radial artery, temperature 34.50c in axilla, and respiratory rate of 28 breaths/min. chest was clear to auscultation with good air entry on both lung fields. The pericardium was quite with normal first and second heart sound. The sting site right hand was not swollen and without detectable sting marks. The patient was admitted to the emergency department with grade IV scorpion envenomation. Immediately, he was put under O2 via nasal prong, positioned on left lateral side. Subsequently, three vials of scorpion ant-venom diluted in 150cc of 0.9% of normal saline was given slowly over 30 minutes. His irritability continues despite treatment and diazepam 5mg intravenously once was given. Besides, local infiltration with lidocaine hydrochloride injection USP 2 %, nifedipine 10mg orally and frequent suctioning of secretions was done. Overnight, his general condition was getting better and was transferred to inpatient department with pain killers, antihypertensive and maintenance IV fluids.

After 15 hour of the bite, the child again become restless with twitching of face and vital signs of BP 120/60mmHg, pulse rate 126beats/min, temperature 39.90c, and respiratory rate of 30 breaths/min. in the meantime, the patient was investigated with CBC, EKG, blood chemistry and chest x ray. The EKG showed sinus tachycardia, mild ST-T abnormality in V5 andV6, inverted T wave in aVR, V1, V2, tented T wave V3, flat T wave in V5, 6 with Sign of left ventricular hypertrophy. (Fig 1) The Chest x-ray was clear of normal study, complete blood count was of white blood cells 7×103, Hgb 13.4mg/dl, Hct 41% and platelet count of 225×103 and blood chemistry and amylase showed mild elevation of Liver enzymes (ALT, AST). (Fig 2)

On the subsequent management, diclofenac 50mg IM once, basing with tape water, and nasogastric tube (NGT) for feeding was done. The abnormal body movement persisted despite diazepam, and phenobarbital 60mg tablet was given through NGT. Within six hours of his stay in the inpatient department, his breathing pattern altered and condition deteriorated further going to deep coma. The last record of vital signs showed BP 100/0mmHg, pulse rate 136beats/min, temperature 41.50c, and respiratory rate 70 breaths/min. Finally, even though he was managed intensively to the level the hospital capacity, he collapsed after 22 hours of his admission to the hospital.

Discussion

Scorpion venom is water soluble composed of mixture numerous toxins and enzymes with neurological tropism acting on ion channels of excitable cells. Toxins binding to the sodium channel are most important, at least with regard to mammals, particularly humans. The main consequence is strong depolarization of the membrane, followed by a drop in excitability. (4) The venom which delays the closing of neuronal sodium channels, resulting in "autonomic storm" owing to sud-

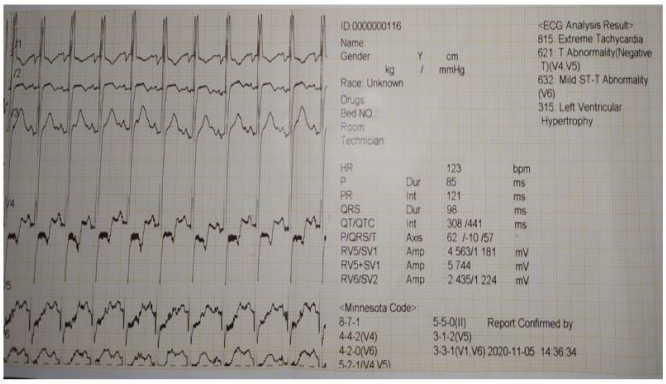

Figure 1: *EKG changes*

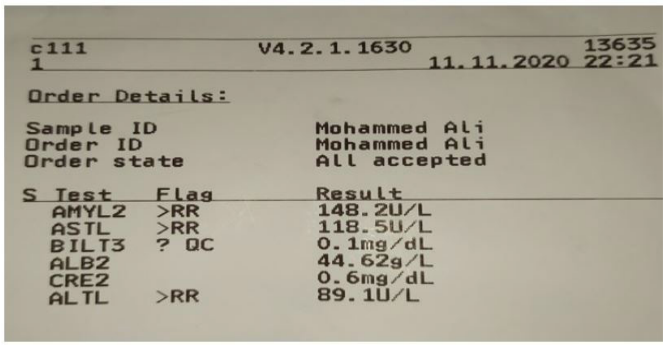

Figure 2: *Blood chemistry results*

den outpouring of endogenous catecholamine's into the circulation. At high doses, they prolong the action potential of excitable cells and induce paralysis and cardiac arrhythmia. (9)

In our patient, the initial parasympathetic excitation was characterized by profuse sweating, ice cold extremities, hyper salivation, lacrimation, restlessness within 15 minutes of the bite. In most of the cases the initial parasympathetic symptoms occur in 3-7 hours after the stung. These immediate body reactions seen in our patient can be related to the amount and type of toxins in the venom secreted at the time of stung and can indicate poor prognosis.

Hyperpyrexia is an extraordinary high grade fever greater than 41.50c which requires cooling blankets or cool water basing to control body temperature by preventing temperature sensitive body enzymes from dissociation. Persistent hyperpyrexia retractable to treatment leads multi organ failure and death. In our case, fever occurs after 15 hours of the stung which never drops below 39.90c with antipyretics and basing with tab water. Hyperpyrexia seen after initial diverse parasympathetic symptoms is a sign of poor prognosis though the pathogenesis is poorly understood.

In our patient, the EKG results mimics signs of myocarditis probably provoked by abnormal release of epinephrine and norepinephrine from adrenal glands to the top of the direct effect of scorpion venoms to cardiac muscles which affected the membrane channels. Toxins-α inactivate the closing potential of the sodium channel resulting strong depolarization of the membrane, followed by a drop in excitability paralysis and arrhythmia. Strong depolarization cardiac muscles and the extremely increased heart rate and contractility can demand extra oxygen predispose to ischemia of myocardium.

This case had showed repetitive convulsions which couldn't be attributed to other cause. This could be mainly caused by the hyperpyrexia, direct cause of the sting. Phenobarbital tablet was given via NGT be-

cause intravenous preparation was not available in the hospital which could be very helpful in the management high grade fever. Intubation and deep sedation could have also change the final outcome. Even though scorpion sting is common in many regions of this country, the types of scorpions and severity of complications may differ by sub-regions in the country as there are similar reports around the lowlands, near the border to Sudan. (7) But, further studies which solidifies this findings are highly recommended

Conclusion

Availability of scorpion anti-venom, alha-1 blocker in the hospitals and physician's high index of suspicion on the anticipated complications of scorpion sting are essential to decrease morbidity and mortality. Beside awareness of the community about scorpion sting related fatal outcomes attention to the possible preventive measures has to be done. Our case was complicated with hyperpyrexia, convulsions and myocarditis. He might be benefited by intensive care unit management in higher centres.

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