

Case report: stingray envenomation

Abstract

Envenoms of aquatic animals are often hazardous to swimmers, surfer, divers, and fisherman. Stingray stings are common happened along coastal regions and most of the incident found in the shallow water. Most of stingray envenomation are mild, so the victim may not seek medical care but some of the case had high profile media coverage following a rare fatality. The integument sheath of stingray contain venom gland, when it's torn away or embedded in soft tissue of victim, venom may release and cause severe pain on contact or systemic envenomation. Rapid effective treatment improves immediate outcomes and minimizes secondary complication including infection, allergy or wound complication such as tetanus.

Keywords: marine envenomation, stingray envenomation, sting-ray injuries, immediate management

Volume 7 Issue 5 - 2017

Andy Zulfiqqar,¹ Sarwan,¹ Evhy Apryani,² Taruna Ikrar³

¹Departement of Internal Medicine, Manambai Abdulkadir general hospital, Indonesia

²School of Pharmacy Shanghai Jiao Tong University, China

³Biomedical Sciences, National Health University, USA

Correspondence: Evhy Apryani, School of Pharmacy Shanghai Jiao Tong University, China, Email evhy.apryani@yahoo.com

Received: November 14, 2017 | **Published:** November 29, 2017

Introduction

Treatment is symptomatic. Heat immersion may help with the pain. Stingrays cause localized damage and a typically severe envenomation. The venom is deactivated by heat. The stingray spine, including the venom gland, typically is difficult to remove from the victim, and radiographs may be necessary to localize the spine or fragment. Surgical débridement occasionally is needed. Direct trauma can result from contact with marine creatures. Hemorrhage and tissue damage occasionally are severe. Infections with organisms unique to the marine environment are possible; antibiotic choices are based on location and type of injury. Shark attacks, although rare, require immediate attention.

Stingray envenomation is a common marine injury. Stingray often buries themselves in the sand or mud coastal water. Usually, fisher or swimmer walk in shallow water and accidentally trampled on the sting-ray. When the stingray feel encounter the danger, it will raises its tail and strikes with it spine as an instinctive and a defense mechanism of the stingray. The stingray is the unique flat cartilaginous fish that has a sharp bilaterally retro serrated spine and integumentary sheath where the venom remains concentrated. The serrated spine found on the proximal third of the tail and encased in an integumentary sheath.¹⁻³

As for mentioned above, the spine has integumentary sheath contains a venomous protein that released as spine strike tissue. This causing intense pain and tissue necrosis, in severe cases may developed into systemic envenomation such as diaphoresis, nausea, cardiac arrhythmias, seizures, muscle cramp, tremors, skin rash, headache, delirium, fever, hypertension, syncope, anxiety and a host of other common allergic reactions.^{4,5}

Case report

A 30-year-old man was wading in the shallow ocean water of Labangka beach, Southern Sumbawa. He felt a sharp pain in his right sole of his foot (Figure 1) and noticed a small rounded fish strike. The skin appeared dusky or poorly perfused, mild laceration accompanied with intense pain, local hemorrhage, and necrosis with bluish edge. After contacted with stingray, he started experience excruciating pain (VAS Score 9), calf cramp, nausea, and epigastric pain. He brought

to local primary health center 5hours later and taken oral NSAID (mefenamic acid) and amoxicillin was given, 15minutes later patient started having seizures. Seizures stopped after the administration of 5mg IV of diazepam and he referred to ER. In ER patient came with unconsciousness due to diazepam injection. Patient was somnolent and diaphoresis. The patient also complained an excruciating pain in site of contact and shortness of breathing.



Figure 1 Stingray injury on the foot.

Physical examination showed the increase in blood pressure (170/110). There were rales on the basal part of the right pulmonary. On laboratory result were found an increase of leucocytes, mild hypokalemia, evidence of acute kidney injuries (Table 1) and ECG reveal sinus tachycardia.

At the Emergency Room the foot soaked with warm water, the water temperature unrecorded and surgery performed (cross-incised and drainage). On surgery, there was no spine of stingray found instead a small white particle and blood was presented. Ceftriaxone, Ketorolac and Tetagam were given. 2hours after surgery patient felt better and vas score was down to 2 and patient is discharge on the third day.

Table 1 Laboratory result

| Lab Test | Result | References ranges |
|-------------------------------|--------|--------------------------------|
| Na mmol/L | 133,23 | 135,37-145.00mmol/L |
| K mmol | 3,12 | 3.48-550mmol/L |
| CL mmol/L | 105,94 | 96.00-106.00mmol/L |
| Urea mg/dl | 38 | 6-26mg/dl |
| Creatinine mg/dl | 1.4 | 0.9-1,3mg/dl |
| Hemoglobin g/dl | 13 | 12-16g/dl |
| Hematocrit | 40.5 | 42-52 |
| Platelets 10 ⁹ /L | 265 | 150-450 10 ⁹ /L |
| Leucocyte 10 ³ /uL | 15.77 | 4.80-10.80 10 ³ /uL |

Discussion

Indonesia is archipelago countries that comprising of more than 17,000 islands spread over 5200km from Banda Aceh, on the tip of Sumatra in the west, to West Papua in the east. There is no doubt Indonesia water are home to 54 species of batoid rays belonging to 12 families.^{6,7} Not only have enormous species of rays, Indonesia also has numerous of traditional medicines that known as jamu, myths, and superstitions. Among these, most Indonesian believe that the use of fresh urine on site injury to relieve pain and complication of stingray envenomation.

Currently there is no treatment is available (serum anti-venom), immersion of hot water is the only first aid that recommended for the treatment of the stingray envenomation. It is reported that hot water (42 to 45 degrees Celsius) will denature the enzymes, which cause the pain and prevent further tissue necrosis. The immersion of hot water must be given for 30-90 minutes or until pain is resolved. If the pain is still present then administration of systemic analgesic is recommended. In some cases may require administration of an opioid drug. Literature investigations found that 1 reference mentioned about tetanus injection after the injury of stingray of 7 references on tetanus after injuries for animal, but tetanus prophylaxis and antibiotic is mandatory.⁸

Serious complication is not often find and reported in Indonesia but some countries such as Australia, new Zealand, Columbia, Mexico, Texas, and Fiji had reported the serious complication after the stingray envenomation. Fatalities specifically resulted from direct penetration in major blood vessel, heart or vital organs.⁹ Serious complication more likely caused by untreated infection, most infection resulted by the microorganism that found in water of injuries site, common pathogens to infect the wound include staphylococcus aureus and streptococcus species.

Our patient came to ER after 6 hours of contact with systemic envenomation include seizures, excruciating pain, shortness of breathing, excruciating pain, epigastric pain and symptoms of heart failures. In this case, aggressive irrigation and surgical explorations are mandatory to remove foreign body, and necrotic tissue. The primary closure is delayed and the wound is left open to prevent anaerobic infection. Systemic symptoms were ceased 2hours after surgery. Quinolone (ciprofloxacin) is antibiotic of choices but 1 cohort studies found that 1 of 30 patients has worsening infection, and switched to Cephalosporin (Cephalexin or ceftriaxone) as antibiotic.⁸

Our observation point out to the conclusion that the envenoming of sting ray is very severe if the first aid of hot water immersion not applied. Pain management and wound management is crucial step on managing sting-ray injuries, we hope to contribute to a better understanding on management of these harmful injuries.

Acknowledgements

None.

Conflict of interest

The author declares no conflict of interest.

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