






An efficient protocol for avoid sequelae over stingray sting injury

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TECHNICAL NOTE

The artificial reservoir at Luiz Eduardo Magalhães hydroelectric power plant, Tocantins River, is one of the most beautiful sceneries in Brazilian Amazon. The reservoir has clean, calm and warm water, being an inviting place to the practice of aquatic sports and recreation. This ecosystem is located in the Amazon region, where biodiversity is remarkable, including organisms that may cause harm to humans. The reservoir, for example, provides adequate environments to alligators, piranhas and poisoned stingrays. Although alligator's attacks are very rare, piranha bites and stingrays stings are frequent. The reservoir is populated with several species of piranhas (e.g. *Serrassalmus*, *Pygocentrus*) and stingrays (e.g. *Potamotrygon*), ¹ which are very abundant in shallow littoral areas, including sandy beaches used by local people and tourists. Piranha attacks usually cause small wounds, but stingrays may provoke serious injuries. Usually, the lesions caused by stingrays are very painful and involve edema and necrosis by poison ^{2,3}. There is also risk of severe secondary infection by microbial population related to stingray's mucus. ⁴ Frequently, the injuries are compounded because the injured individual is not given proper first aids and does not seek medical help for appropriated care. ⁵ Thus, the total remission of symptoms can take months. The scientific literature and medical records describes many complex cases. ^{1,6}

Considering that people is largely uninformed about adequate post-lesion treatments, we describe in this letter an efficient treatment against stingray lesions, involving a 42-year-old man injured in his left ankle during a fishing trip in this reservoir at Palmas municipality, Tocantins State, Brazil (Figure 1). The sting stuck his lateral ankle 3 cm posterior to the lateral malleolus. The lesion was immediately immersed in hot water (about 45°C) to denature the tertiary structure of the poison proteins by at least 60 min. ⁷ Approximately 2 hours after the incident, he received care attention in the emergency room of the local hospital. The prophylaxis for tetanus was applied and two perpendicular incisions (2 cm) were made to disinfect and clean the wound from mucus, remaining poison and sting debris. Broad-spectrum antibiotics were taken along with analgesic and anti-inflammatory to control the wound development and reduce the nociceptive pain and edema.

To test the efficiency of hot water in treatment, we performed *in vitro* experiments using mucus collected from five stingrays (*Potamotrygon* sp.) that was incubated in potato dextrose agar (PDA) and Mueller Hinton agar to isolate fungus and bacteria, respectively, at different temperatures (25° and 50°) for three days. The experiments did not reveal any reduction over the microbial inoculum in any temperatures tested, confirming the efficiency of hot water only in the initial procedures to attenuate the venom.

The use of broad-spectrum antibiotics (21 days) and the continuum asepsis provided the recovery of natural movements of foot and absence of necrosis after 30 days. The application of these protocols (hot water, surgery to remove mucus and sting debris, antibiotics and asepsis) allowed an efficient and faster recovery without major complications.



Figure 1. (A) Specimen of stingray (*Potamotrygon* sp.). (B) Sting detailed view. (C) Injury (arrow) aspect in the same day of lesion. (D) Lesion aspect after 01 day. (E) Lesion aspect after 07 days. (F) Lesion aspect after 30 days



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