



Article/Artigo

Trauma and envenoming caused by stingrays and other fish in a fishing community in Pontal do Paranapanema, State of São Paulo, Brazil: epidemiology, clinical aspects, and therapeutic and preventive measures

Traumas e envenenamentos por arraias e outros peixes em uma colônia de pescadores no pontal do Paranapanema, Estado de São Paulo, Brasil: epidemiologia, aspectos clínicos e propostas terapêuticas e preventivas

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ABSTRACT

Introduction: Accidents caused by fish are common in inland fishing communities in Brazil, being work-related injuries in the majority of cases. These populations have no information on the mechanisms of trauma or envenoming. **Methods:** Through a questionnaire administered to fishermen, we obtained clinical and epidemiological data on accidents in Rosana, Pontal do Paranapanema, State of São Paulo, Brazil. These data were analyzed and converted into an easily understood prevention and treatment program for the colony. **Results:** Thirty-nine fishermen replied to the survey. All of the patients had been hurt by fish. Of those mentioned, the yellow catfish (*Pimelodus maculatus*) was the main fish species associated with injuries, but others also caused trauma to the fishermen. Six fishermen had been envenomed by stingrays. Pain and ulcers were the main symptoms and were described as intolerable. Approximately half of those injured were treated using traditional folk remedies. **Conclusions:** The fishermen suffered multiple accidents with catfish, which are venomous and cause intense pain, as well as trauma due to other fish, such as surubins, traíras, freshwater croakers, and piranhas. Approximately 16% of those interviewed presented with envenomation from stingrays. Our data and previous experience in the area led to the creation of a pamphlet with clear language that can effectively help fishermen in the region, an area in need of health services and disease prevention. This initiative also applies to the whole La Plata River basin, which has similar fauna.

Keywords: Venomous animals. Trauma. Bites and stings. Fishermen. Health populations. Brazil.

RESUMO

Introdução: Os acidentes causados por peixes são comuns em comunidades de pescadores fluviais no Brasil, sendo acidentes ocupacionais na maioria das vezes. Estas populações não têm informações dos mecanismos de trauma e envenenamento. **Métodos:** Através de um questionário aplicado aos pescadores, foram obtidos dados clínicos e epidemiológicos sobre acidentes em Rosana, Pontal do Paranapanema, Estado de São Paulo, Brasil. Estes dados foram analisados e convertidos em um programa de prevenção e tratamento de acidentes através de um folheto de fácil assimilação. **Resultados:** Trinta e nove pescadores responderam o questionário. Todos os pacientes apresentaram ferimentos causados por algum peixe. Dos peixes mencionados, mandijubas (*Pimelodus maculatus*) foram os mais associados aos ferimentos, mas outros também causaram traumas. Em relação às arraias, seis pescadores tinham sido envenenados. Dor intensa e úlceras foram os principais sintomas. Aproximadamente metade dos acidentados usou apenas medidas de tratamentos populares. **Conclusões:** Os pescadores apresentaram acidentes múltiplos por mandis, que são peçonhentos e causam dor intensa, assim como traumas por outros peixes, como surubins, traíras, corvinas de água doce e piranhas. Cerca de 16% dos entrevistados apresentaram envenenamento por arraias. Nossos dados e experiência prévia permitiram a criação de um folheto de fácil assimilação pelas populações locais que pode ajudar os pescadores de forma efetiva, em uma área extremamente carente de serviços de saúde e prevenção de doenças. Esta iniciativa é aplicável a toda a bacia do Rio da Prata, área extensa e de fauna similar.

Palavras-chaves: Animais peçonhentos. Trauma. Picadas e mordeduras. Pescadores. Saúde Pública. Brasil.

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INTRODUCTION

Accidents from fish are common in amateur and professional fishermen. Assessment of the problem is still not very effective in our country and data on the problem are scarce¹⁻¹². The incidence of accidents is high in inland fishing communities and these colonies have no information on trauma or envenoming mechanisms⁹. Traditional folk remedies are generally used as there are no guidelines for the treatment or prevention of these accidents.

Research on stingray injuries is even rarer as most of the fish associated with accidents are part of the local fauna and are always present in the nets of professional fishermen, whereas stingrays were only first detected in the region 50 years ago¹³⁻¹⁸. Stingrays are venomous and carry toxins that cause inflammation and severe pain in the early stages and skin necrosis in the late phases of envenoming¹⁶⁻¹⁸.

Stingray colonization of the upper Paraná River is associated with the building of the Itaipu hydroelectric plant, which allowed these fish to colonize the initial points of the river. Currently, there is a very large population of stingrays in the studied area, although contacts with fishermen are not frequent due to the fear that they provoke in the population^{15,18}. This study aimed to establish a clinical and epidemiological profile of accidents with stingrays and other fish in the Paraná River fishing community in Rosana, a town of nearly 300 fishermen on the borders of 3 Brazilian States: São Paulo, Mato Grosso do Sul, and Paraná. Upon receipt of this profile, we compiled an accident prevention and treatment plan that can be used in the colony and along the Plate Basin Rivers (Tietê, Paraná, Paraguay, and Plate Rivers), which present with the same fish fauna as this region.

METHODS

Through a questionnaire guided by previous studies and applied to fishermen, we obtained clinical and epidemiological data on accidents in this location. These data were analyzed and converted into a prevention and treatment program that was easy for the colony to assimilate.

Ethical considerations

This study was submitted to and fully approved by Botucatu School of Medicine Ethics Committee, São Paulo State University.

RESULTS

Thirty-nine fishermen responded to the survey. All had been hurt by fish. The specific fish associated with the injuries are shown in **Table 1**.

Of the fish mentioned, *mandijubas* (*Pimelodus maculatus*) and *surubins* or spotted catfish (*Pseudoplatystoma corruscans*) are catfish with venomous stingers. Other fish have teeth and sharp dorsal fins, causing traumatic injuries in fishermen (**Figure 1**).

Pain was the main symptom and present in all 39 fishermen. Other important findings were edema (7 or 17.9%) and copious bleeding (9 or 23.1%). The pain was tolerable in 26 fishermen and intolerable in 5. There was no ulcer formation in 21 (53.8%) patients, but the remaining 18 (46.1%) presented with ulcers of variable diameter that healed after 1 month. Approximately half of those injured treated the accident by immersion in gasoline (11), urine

TABLE 1 - Fish causing injuries and the frequency of accidents in fishermen.

Fish names	Frequency of accidents in fishermen			
	once	two times	three times	more than 3 times
<i>Mandijubas</i>	3	2	2	18
<i>Piranhas</i>	8	1	1	10
<i>Traíras</i>	3	0	1	7
<i>Pintados</i>	8	0	0	1
<i>Dourados</i>	3	0	2	1
<i>Corvinas</i>	0	0	0	7
<i>Armaus</i>	3	0	0	3
<i>Tucunarés</i>	2	2	0	5
<i>Corimbatá</i>	0	0	0	1
<i>Piauçu</i>	1	0	0	0

(2), and herbs (3). Other methods were chrome mercury, tobacco, garlic, olive oil, tobacco, alcohol, and rubbing the eye of a catfish on the wound (1 each).

With regard to stingrays, 21 (53.8%) out of 39 fishermen identified *Potamotrygon motoro* as the most common species; the other 18 (46.1%) identified *Potamotrygon falkneri*, after looking at photographs included in the questionnaire. Thirty-seven fishermen had seen someone stung by stingrays and 6 (15.4%) had been envenomed themselves. The main initial symptom was pain (100%), which was described as intolerable. The 6 victims presented with ulcers at the injury sites. The ulcers healed after 1-6 months. These 6 patients were treated at a hospital or Community Health Center and used the following first aid measures (before receiving medical assistance): immersion in hot water (1), urine (2), and herbs (6).



FIGURE 1 - Fish species associated with injuries in the studied region. Top left to right: *Mandijuba* (yellow catfish), *Mandijuba* sting, and spotted catfish. Middle row: *dourado*, *traíra*, and *piranha* teeth. Bottom: freshwater stingrays (*Potamotrygon motoro* and *Potamotrygon falkneri*) and tail stings.

Other traditional treatments were the use of smoke and garlic or olive oil (2), alcohol (2), applying a catfish eye to the wound (1),

and contact with a human vagina (1). **Figure 2** shows some clinical aspects of these injuries.



FIGURE 2 - Injuries caused by fish to fishermen in the study. Top left to right: ulcers after a sting from a *mandi*; inflammation/secondary infection resulting from a spotted catfish (*Pintado*) sting and *piranha* bite. Bottom: ulcers resulting from stings by freshwater stingrays.

DISCUSSION

It is interesting to note the large number of multiple accidents involving the yellow catfish (*Pimelodus maculatus*), which are venomous and cause intense pain. We observed a great number of traumas caused by different fish, including the *surubim* or spotted catfish (*Pseudoplatystoma corruscans*), *traíras*, freshwater croakers, and *piranhas*. Freshwater fish can inflict injuries from body structures, for instance dorsal fins (e.g., freshwater croakers, peacock bass - *corvinas*, and *tucunarés*) and teeth (e.g., *piranhas* and *traíras*) or through venom via stingers (e.g., catfish and stingrays). However, there is a notable lack of information on the fish, immediate treatment for the injuries, and the sometimes curious measures used. Injuries and envenoming by stingrays, which are relatively recent in the region, are not uncommon and most respondents have already seen between 1 and 5 victims. Manifestations are severe and disabling, but do not cause death¹⁻¹⁶.

Injuries (traumatic and envenoming) are very common in the studied area, as showed in this manuscript and in the references. Our data and previous experience in the area led to the creation of a pamphlet using direct language that can decisively contribute to aiding the fishermen in the region, an area greatly in need of health services and disease prevention (**Figures 3 and 4**). With the pamphlet, we aim to provide simple methods of first aid for the target population and local health systems in towns with colonies of fishermen in the La Plata basin. In addition to the copies sent to

local health systems throughout the State of São Paulo region of Pontal do Paranapanema, an electronic copy of the pamphlet is available at http://www.fmb.unesp.br/eventos/docs/F_1289218169folder.pdf/.

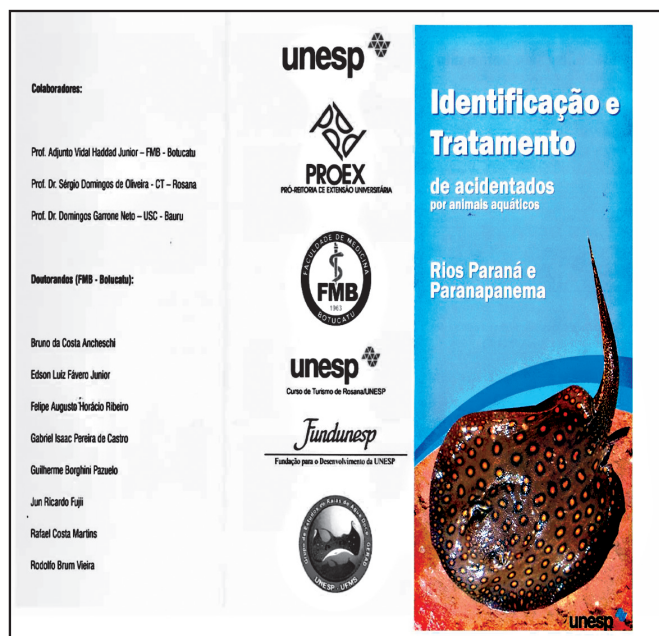


FIGURE 3 - Front of the pamphlet prepared for distribution in the Pontal do Paranapanema region, containing the main fish species that cause accidents and first aid measures for fishermen. The pamphlet used in the campaigns and distributed in the region was ceded by the authors for publication.

Identificação e tratamento de acidentados por animais aquáticos Rios Paraná e Paranapanema

Adaptado de Haddad Jr V - Animais aquáticos potencialmente perigosos do Brasil. Editora Roca, São Paulo, 2008.

Ferimentos puntiformes (luros)		Ferimentos lacerados (tecidos rasgados)	
Presença de ferrões no peixe **	Sem ferrão (só luro) sem envenenamento* espinhos das nadadeiras.	Ferrões - Bordas azuladas ou brancas	Lacerações simples (mordidas e outras agressões)
Arraia Bagres Mandis Pintados VENENOS!	Armaus, Tilápias, Tucunarés, Corvinas, Piaparas, Piraus	Arraia fluviatil, Mandis, Bagres, Pintados (às vezes só luros), VENENOS!	Piranhas, Peixes-cachorro, Armaus, Trairas e outros Peixes, Jacarés, Cobras.
1	2	1	2

** Dor violenta * Dor forte

1 - Imersão em água quente (testar com a mão) por 30-90 minutos (cerca de 50 °C) - vítima

Hospital (médico):

- Infiltração anestésica local
- Retirar espiculas ou fragmentos de ferrão ou epitélio glandular.
- Raio X: persistência de sintomas em fases tardias
- Fazer profilaxia do tétano.

2 - Lavagem intensiva (vítima)

Hospital (médico):

- Exploração cirúrgica
- Antibióticoterapia.
- Prevenção do tétano

Médico: Em todos os casos (especialmente ferimentos lacerados), avaliar antibióticoterapia:
Cefalexina 2,0g/dia por 10 dias ou Amoxicilina e clavulinato de potássio 1,5g/dia por 10 dias.

Mandijuba e ferrões. São os peixes venenosos mais comuns. O acidente causa dor intensa e às vezes, infecções e feridas.

Piranha e traira. Estes dois peixes são os maiores causadores de mordidas nos pescadores, causando infecções e sangramento.

Raios de nadadeiras de tilápia, que causam ferimentos nas mãos dos pescadores. Armau, que causa ferimentos nas mãos de pescadores

Pintados e ferrão lateral. Pintados causam lesões graves e dolorosas, com risco de infecção por bactérias e quebra dos ferrões.

Recentemente, surgiram provas de que existe veneno nos ferrões dos pintados.

Arraia fluviatil e ferrões. Causam acidentes graves, com envenenamento associado à feridas e dor intensa.

FIGURE 4 - Inside face of the pamphlet with suggested guidelines. The pamphlet used in the campaigns and distributed in the region was ceded by the authors for publication.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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