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Sembilang Fish Spine Injury Leading to Systemic Hypersensitivity: A Rural Coastal Case from Muaragembong, Indonesia

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ABSTRACT: Spine injuries caused by sembilang fish (Plotosidae) are a frequent occupational hazard among brackish-water pond workers in coastal Indonesia, yet systemic reactions are rarely documented. We report the case of a 30-year-old male pond farmer from Muaragembong, a rural coastal subdistrict with limited healthcare access, who developed systemic hypersensitivity following a hand puncture from a sembilang spine. The patient experienced immediate localized pain and swelling, followed by the onset of fever, chills, and malaise within hours. Initial assessment occurred during a university-led community service program focused on health outreach, where he received first aid and was referred to a nearby clinic for further management. Treatment with antihistamines and supportive care resulted in complete recovery within 24 hours. This case underscores the potential for systemic reactions despite the generally non-lethal nature of sembilang venom and highlights the vulnerability of coastal aquaculture workers in underdeveloped regions. Improved awareness, early first aid, and preventive education are essential for reducing morbidity associated with marine and brackish-water envenomation in rural settings.

KEYWORDS: Sembilang fish, spine injury, systemic hypersensitivity, envenomation, rural coastal health, aquaculture worker, Muaragembong

INTRODUCTION

Sembilang fish (Plotosidae) are commonly found in brackish-water environments throughout coastal regions of Indonesia, where their dorsal and pectoral spines contain venom capable of causing acute injury.[1] These spine punctures frequently occur during aquaculture activities such as harvesting, sorting, or handling fish, and they represent a notable occupational hazard for coastal communities.[2] Although the venom is generally non-lethal, it contains inflammatory proteins that can trigger intense local pain, rapid swelling, and erythema. In certain cases, individuals may also experience systemic manifestations such as fever, chills, and generalized malaise, indicating a hypersensitivity response. Despite the frequency of these injuries in daily coastal labor, reports of systemic reactions remain limited, and the condition is often underestimated by workers who regard such incidents as routine hazards of their occupation.[3,4]

Muaragembong, a rural coastal subdistrict in West Java, exemplifies an environment where sembilang spine injuries are particularly common. The region is characterized by extensive brackish-water aquaculture, limited healthcare infrastructure, and socioeconomic constraints that contribute to delayed or inadequate medical attention when injuries occur. Many pond farmers rely on experience-based traditional measures, which may not sufficiently address the risk of systemic reactions. Furthermore, access to early clinical assessment is hampered by geographic isolation, long travel distances, and reliance on small local facilities with limited resources.[5,6]

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This case was encountered during a university-led community service program focusing on health outreach in Muaragembong. The program involved multidisciplinary engagement, including participation from students of the Communication Science study program, and provided an opportunity to observe firsthand the health vulnerabilities faced by coastal laborers. The case of a pond farmer presenting with systemic hypersensitivity following a sembilang spine injury underscores the intersection between occupational risk, rural healthcare limitations, and the importance of community-oriented medical education.[7,8] By documenting this presentation, we aim to contribute to the sparse literature on systemic reactions associated with sembilang injuries and highlight the need for improved awareness, preventive strategies, and timely clinical intervention in underdeveloped coastal regions.

CASE PRESENTATION

A 30-year-old male brackish-water pond farmer from Muaragembong, Indonesia, sustained an acute injury to his right hand after being punctured by the venomous spine of a sembilang fish during routine harvesting activities. The incident occurred while he was lifting a catch basket from a brackish-water pond, at which point a live fish slipped against his palm and penetrated the soft tissue lateral to the thenar region. He immediately experienced sharp, intense pain at the puncture site, followed within minutes by progressive swelling and erythema extending proximally along the hand. The patient continued working for a short time, as such injuries were familiar to him and commonly regarded by local pond workers as minor occupational incidents.

Approximately one hour after the injury, the patient began to develop systemic symptoms, including generalized malaise, chills, and a subjective fever. These symptoms progressed as he sought assistance from a nearby community center where a university-led community service team, including the authors, was conducting health outreach activities. On initial assessment, he appeared uncomfortable and mildly diaphoretic. His vital signs showed a low-grade fever and mild tachycardia. Examination of the right hand revealed a single puncture wound with marked tenderness, local warmth, and progressive edema. There was no evidence of retained spine fragments or active bleeding.

The wound was cleansed thoroughly, and initial first-aid care was provided, including warm water immersion for pain reduction and symptomatic management. In view of his systemic symptoms, the patient was advised to seek further evaluation at the nearest healthcare facility. He was transported to a local clinic, where he received antihistamines, analgesics, and supportive therapy. No signs of secondary infection, neurovascular compromise, or compartment syndrome were identified. Over the next 24 hours, his fever and chills gradually resolved, and the localized hand swelling diminished with continued conservative management.

The patient was discharged the following day with instructions on wound care and preventive measures for future pond-related injuries. At follow-up, he reported complete resolution of symptoms without complications. He also expressed surprise at the intensity of the reaction, noting that although he had been injured by sembilang spines in the past, this was the first episode associated with systemic illness.

DISCUSSION

Envenomation from sembilang fish spine injuries represents a significant yet often underrecognized occupational hazard in brackish-water aquaculture communities. The venom apparatus of sembilang, similar to that of other Plotosidae and catfish species, contains protein-based toxins capable of eliciting potent local inflammatory responses. These typically manifest as immediate sharp pain, erythema, and edema due to the release of histamine-like compounds, proteolytic enzymes, and other inflammatory mediators.[9,10] While local effects are well documented, systemic manifestations such as fever, chills, and generalized malaise occur far less frequently and are rarely reported in the literature. In the present case, the rapid progression of symptoms suggests a systemic hypersensitivity reaction, likely mediated by an exaggerated immune response to venom components rather than toxin-induced systemic toxicity, as sembilang venom is not known to cause life-threatening systemic effects.[4,9]

The environmental and occupational context of this case is essential for understanding both the frequency and clinical oversight of such injuries. Muaragembong is a rural coastal subdistrict where brackish-water pond farming constitutes a major livelihood. Workers routinely handle live fish in conditions that predispose them to accidental puncture wounds from venomous spines. Despite the prevalence of such incidents, many farmers consider them a routine part of their work and often rely on informal or traditional remedies rather than seeking prompt clinical evaluation.[2,5] This tendency is compounded by limited access to healthcare services, long travel distances to adequately equipped facilities, and socioeconomic constraints that discourage early consultation. Consequently, systemic reactions may go unrecognized or untreated, increasing the risk of complications such as secondary infection or prolonged morbidity.[4,6]

The case also highlights the importance of community-based health outreach in underdeveloped coastal settings. The injury was evaluated during a university-led community service program, where the presence of trained personnel facilitated early recognition of systemic symptoms and timely referral.[5,7] Community engagement initiatives can play a significant role in bridging gaps between occupational risk and healthcare access by offering first-aid education, raising awareness of venomous marine hazards, and encouraging safer handling practices among local workers. These programs may also reveal patterns of injury that are underreported in formal healthcare systems, providing valuable insights into the environmental health challenges faced by marginalized populations.[2,9]

From a clinical perspective, the management of sembilang spine injuries should prioritize immediate wound cleansing, warm water immersion to inactivate heat-labile venom components, analgesia, and close observation for evolving systemic signs. Although most cases resolve uneventfully with supportive care, clinicians should be aware that systemic hypersensitivity reactions, as seen in this patient, require prompt assessment and may benefit from antihistamines or other symptomatic treatments. Additionally, healthcare providers working in coastal or aquaculture-oriented regions should remain vigilant for potential complications such as foreign-body retention, delayed cellulitis, or rare severe allergic reactions.[3-4,11]

This case contributes to the limited body of literature on systemic hypersensitivity associated with sembilang envenomation and underscores the need for heightened awareness in both clinical and community settings. By documenting a presentation that occurred in the context of a rural community service program, the report emphasizes the intersection of environment, occupation, access to care, and public health interventions.

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Strengthening preventive education, promoting protective equipment use, and improving local healthcare responsiveness may collectively reduce the burden of such injuries in vulnerable coastal populations.[2,4]

CONCLUSION

This case illustrates that although sembilang fish spine injuries are commonly regarded as minor occupational hazards in coastal aquaculture communities, they may occasionally lead to systemic hypersensitivity reactions requiring clinical attention. Early recognition of systemic symptoms and timely management are essential to prevent complications and ensure full recovery.[1,8] The setting of Muaragembong highlights how limited healthcare access and reliance on informal first-aid practices can contribute to the underestimation of such occupational risks.[5] Encounters like this during community service activities underscore the importance of strengthening local awareness, promoting safe handling practices, and improving first-aid preparedness in underdeveloped coastal regions.[10,11]

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