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Popular Article

Fish Zoonosis Impact on Human Health

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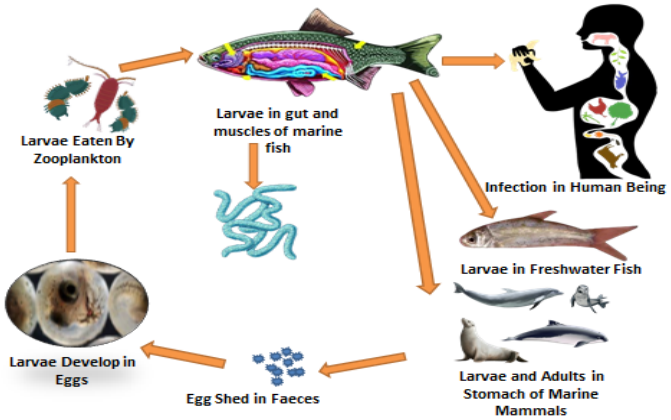
This paper explores the growing public health concern of fish zoonosis, the transmission of diseases from fish to humans. It delves into the various pathogens harbored by fish, including bacteria, viruses, fungi, and parasites, and the potential consequences for human health upon exposure. The paper also examines the factors contributing to the rise of fish zoonosis, including climate change and changes in food production practices. Finally, it discusses strategies for mitigating these risks through food system approaches, biosafety and biosecurity measures, and improved surveillance.

Introduction

The concept of "One Health" emphasizes the interconnectedness of human, animal, and environmental health. Zoonotic diseases, those transmissible between animals and humans, are a significant concern within this framework. While traditionally associated with terrestrial animals, fish are increasingly recognized as potential reservoirs for zoonotic pathogens. This paper explores the various ways fish can transmit diseases to humans and the potential health consequences.



Potential Fish-Borne Pathogens

Fish can harbor a diverse range of pathogens, including:

Bacteria:

- Mycobacterium species: Frequently found in fish, these bacteria can cause skin lesions in humans, muscle and tendon infections, and severe symptoms like infected lymph nodes and tuberculosis-like lung disease in immunocompromised individuals.
- Brucella spp.: Causes brucellosis, a disease contracted through inhalation, ingestion of contaminated food, or close contact with infected animals, leading to fever, fatigue, and other systemic symptoms.
- Aeromonas sp.: Common in freshwater fish, these bacteria can cause skin infections, gastroenteritis, and septicemia in vulnerable individuals.
- Salmonella spp.: Contaminates seafood and can cause abdominal cramps, fever, and diarrhea, particularly from undercooked fish or shellfish.

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- Streptococcus iniae: Can infect humans through cuts on the skin, causing fever and lymphatic inflammation, posing a risk especially to those handling fish.

Viruses:

- Noroviruses: Lead to acute gastroenteritis when people consume contaminated fish and shellfish.
- Hepatitis A virus: Causes liver inflammation through consumption of contaminated fish, leading to symptoms like jaundice, fever, and abdominal pain.
- Fungi: While less studied, zoonotic fungal transmission from fish poses a growing concern due to its potential public health impact.

Parasites:

- Metacercariae: Found in fish muscles, these parasites can cause severe health problems like pancreatitis, chronic liver disease, and cholangitis in humans who consume them.

Zoonotically Infected Fish

Healthy-looking fish do not guarantee they are disease-free. Signs to watch for in fish potentially harboring zoonotic pathogens include:

- Loss of appetite
- Fatigue
- Bulging eyes
- Enlarged abdomen
- Skin discoloration or ulcers
- Difficulty swimming

Climate Change and Foodborne Zoonotic Diseases

Climate change disrupts ecosystems and alters food production practices, potentially increasing the risk of fish-borne zoonosis. Rising temperatures and extreme weather events can impact the virulence, distribution, and prevalence of pathogens in food.

Foodborne Zoonotic Diseases and Food Security

Foodborne zoonotic diseases threaten global food security and safety. Factors like poverty, unstable food supplies, and increased human-wildlife interaction can contribute to the emergence and spread of these diseases.

Food System Approaches to Control

Implementing robust food system controls is crucial for mitigating the risk of fish-borne zoonosis. These measures include:

- Maintaining hygiene practices and separating healthy from diseased animals at farms and processing facilities.
- Implementing biosecurity measures like vaccinations and proper animal housing.
- Proper handling and storage of fish after slaughter.
- Educating producers and consumers about safe food handling practices.

Biosafety and Biosecurity Measures

Effective risk assessment, surveillance programs, and rapid response protocols are essential for managing fish zoonosis threats. These measures involve:

- Scientifically based risk assessments.
- Comprehensive surveillance throughout the food chain.
- Utilizing risk-based control strategies, with stricter measures in high-risk areas.

Route of Transmission

Fishborne zoonosis can occur through various routes, with the most common being:

- Oral: Consumption of contaminated fish (64% of transmission cases).
- Skin contact: Through cuts or abrasions exposed to infected fish (23%).
- Water: Contact with contaminated water (19%).

Organizations Monitoring Fish Zoonosis

Several international organizations, including the World Health Organization (WHO), recognize the importance of addressing fish zoonosis. The WHO's One Health program established the Zoonoses Technical Working Group (ZTWG) to manage zoonotic diseases.

Conclusion

Fish zoonosis presents a multifaceted and growing public health concern that demands immediate and coordinated action. The rising incidence of zoonotic diseases from fish underscores the critical need to integrate human, animal, and environmental health approaches, encapsulated in the One Health framework. This

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approach is essential for effectively preventing, detecting, and responding to zoonotic diseases that traverse the human-animal-environment interface. The variety of pathogens harbored by fish—including bacteria, viruses, fungi, and parasites—pose significant health risks to humans, especially those involved in handling, processing, or consuming fish. Notably, pathogens such as Mycobacterium species, Brucella spp., Aeromonas sp., and Salmonella spp. have demonstrated the potential to cause severe health conditions ranging from skin infections and gastroenteritis to systemic and potentially life-threatening illnesses. The silent nature of these infections in apparently healthy fish exacerbates the challenge, necessitating vigilant monitoring and control measures.

Climate change further complicates this scenario by altering the dynamics of ecosystems and food production systems. The resultant increase in the virulence, distribution, and prevalence of pathogens due to rising temperatures and extreme weather events calls for adaptive and resilient strategies in food safety and public health practices.

The impact of fishborne zoonotic diseases on global food security and safety is profound. Economic instability, poverty, and increased human-wildlife interaction amplify the risk of disease emergence and spread. To mitigate these risks, robust food system controls must be established, including stringent hygiene practices, biosecurity measures, proper handling and storage protocols, and comprehensive education for producers and consumers on safe food handling practices.

Biosafety and biosecurity measures are indispensable for managing fish zoonosis threats. Effective risk assessments, continuous and extensive surveillance programs, and rapid response protocols form the backbone of a proactive defense against zoonotic outbreaks. These measures should be based on scientific evidence and tailored to address the specific risks identified through thorough monitoring of the food chain.

Transmission pathways of fishborne zoonosis highlight the need for multiple preventive strategies. The predominance of oral transmission through the consumption of contaminated fish, along with significant risks from skin contact and exposure to contaminated water, underscores the importance of comprehensive safety measures across all stages of the food supply chain.

International collaboration and coordination are crucial in addressing fish zoonosis. Organizations like the World Health Organization (WHO) play a pivotal role in recognizing and managing these threats through initiatives such as the One Health program and the Zoonoses Technical Working Group (ZTWG). These entities provide a platform for sharing knowledge, resources, and best practices to tackle zoonotic diseases effectively.

In conclusion, addressing fish zoonosis requires a multifaceted approach that combines robust food system controls, enhanced biosafety and biosecurity measures, and improved public awareness. By fostering international collaboration and leveraging scientific advancements, we can mitigate the risks associated with fishborne pathogens, ensuring a safer food supply and protecting public health. Continued research and investment in understanding the zoonotic potential of fish and developing effective prevention strategies are imperative for a sustainable and health-secure future.

Reference

Boylan, S., 2011. Zoonoses associated with fish. *Veterinary Clinics: Exotic Animal Practice*, *14*(3), pp.427-438.

Gauthier, D.T., 2015. Bacterial zoonoses of fishes: a review and appraisal of evidence for linkages between fish and human infections. *The Veterinary Journal*, *203*(1), pp.27-35.

Wodajo, W., 2020. Review on Zoonotic Bacterial Diseases of Fish. *ARC Journal of Animal and Veterinary Sciences*, *6*(1), pp.1-9.