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An Overview of Water-based Protozoans

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ABSTRACT

Water parasites represent a vast group of organisms that grow in aquatic environments and pose significant challenges to global public health. This extension article explores the various microscopic invaders such as Giardia and Cryptosporidium. Moreover, the global distribution of water-based parasites and associated risks are also described. Understanding how water parasites interact with hosts and the environment is essential for effective prevention and intervention.

Introduction:

Water, essential for life, hides a world of microscopic organisms. In rivers and lakes, tiny water parasites silently affect aquatic life and humans. These unnoticed creatures often impact ecosystems. Like viruses and bacteria, protozoa also have some traits that can aid them to survive and transmit through water (1).

Lifecycle

Protozoa often begin their life cycle as a cyst, a dormant and elastic form that helps them withstand adverse conditions such as dehydration and high temperatures. When environmental conditions are favorable, cysts undergo cyst excystation, a process in which they develop into active, motile trophozoites. These trophozoites are feeding and reproductive stages of the protozoan life cycle, actively swimming and utilizing bacteria and organic matter in the water. Under the right conditions, protozoa reproduce by many means, such as binary fission, budding, or multiple fission to form new trophozoites. As environmental conditions change or worsen, some protozoa may revert to the cyst stage as a survival strategy. This life cycle enables aquatic protozoa to Succeed in a variety of aquatic habitats and allows them to remain stable in aquatic ecosystems.

Transmission

Water protozoa spread in many ways. They can be in contaminated water, like cysts or larvae, and get infected by drinking or touching it. Direct contact with infected hosts, through the skin or contaminated food, is another way. Some parasites use insects or snails to help them move between hosts (2). Water-borne diseases led to more than three hundred cases of protozoal infection in humans during 2011 and 2016 (3).

Types and their Symptoms

1.*Giardia lamblia*

Initial symptoms include intestinal uneasiness, nausea, and anorexia. The acute stage, lasting 3-4 days, includes traveler's diarrhea.

2.*Naegleria fowleri*

Progressive headaches, fever, nausea, vomiting, pharyngitis, and cardiac abnormalities may also develop.

3.*Entamoeba histolytica*

Bloody diarrhea, abdominal pain, fever.

4.*Cryptosporidium parvum*

Abdominal pain, fatigue, nausea and fever.

5.*Isospora belli*

Profuse diarrhea, smelling bowel movements, and malabsorption.

Treatment and control

Physical treatments that affect the survival or removal of protozoan parasites include freezing, heating, filtration, sedimentation, UV light, irradiation, high pressure, and ultrasound. Ozone is a more effective chemical disinfectant than chlorine or chlorine dioxide for inactivation of protozoan parasites in water systems (4). Drugs like, paromomycin, and azithromycin are effective against water parasites (5). It's necessary to clean water by using treatments like filtration and disinfection. Educating communities about hygiene and sanitation is crucial. Controlling the population of hosts like snails helps break the parasite cycle. Early detection and quick responses to outbreaks (6).

Conclusion

Addressing water parasites requires action and awareness. By managing clean water and promoting hygiene, we can protect both nature and human health. Water screening is crucial to prevent the spread of parasitic protozoa. Cracks in water pipes between stations and houses can lead to contamination with infective parasites, especially in areas near agricultural fields polluted with cow waste.

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