

Human Health Risks Associated with Zoonotic Parasitic Disease Transmission

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DESCRIPTION

Zoonotic parasitic diseases, which are transmitted from animals to humans, represent a significant and growing threat to global public health. These infections can be caused by protozoa, helminthes, or ectoparasites and are often associated with close human-animal interactions, inadequate sanitation and increasing encroachment into wildlife habitats. The transmission of zoonotic parasites is influenced by a range of factors, including environmental changes, agricultural practices, globalization and socio-economic conditions. Understanding the risks posed by these diseases is critical to controlling their spread and protecting human health.

The transmission of zoonotic parasitic diseases typically occurs through direct contact with infected animals, ingestion of contaminated food or water, or via vectors such as ticks and mosquitoes. One of the most well-known zoonotic parasites is Toxoplasma gondii, which can infect humans through contact with cat feces or consumption of undercooked meat. While often asymptomatic, Toxoplasma infection can cause severe complications in immunocompromised individuals and pregnant women, including neurological damage and miscarriage. Another major example is Echinococcus species, responsible for hydrated disease. Humans become accidental hosts through the ingestion of eggs shed by infected dogs or wild canines, leading to the development of cysts in organs such as the liver and lungs, which may require surgical intervention.

Protozoan parasites like Cryptosporidium and Giardia lamblia are also common zoonotic agents. These organisms contaminate water supplies and cause outbreaks of diarrheal diseases, particularly in areas with poor sanitation. They are highly resistant to conventional water treatment methods and pose a persistent challenge in both developing and developed nations. Zoonotic transmission of *Trypanosoma cruzi*, the causative agent of Chagas disease, occurs through contact with triatomine bugs, which thrive in poorly constructed housing in rural Latin America. Although initially asymptomatic, the infection can lead to chronic cardiac and gastrointestinal complications years after exposure.

Helminthic zoonoses are another important category. *Trichinella spiralis*, acquired through consumption of raw or undercooked pork, can cause muscle inflammation, fever and in severe cases, death. Similarly, *Taenia solium*, the pork tapeworm, poses a serious threat when humans ingest its eggs, leading to cysticercoids, which can affect the brain and result in seizures and other neurological issues. Zoonotic schistosomiasis, caused by *Schistosoma japonicum*, involves waterborne transmission from animal reservoirs like cattle and dogs, particularly in parts of East Asia.

The risks associated with zoonotic parasitic infections are exacerbated by human behaviors and environmental changes. Rapid urbanization, deforestation and agricultural expansion bring humans into closer contact with wild and domestic animals, increasing the likelihood of cross-species transmission. Inadequate veterinary control, lack of public awareness and limited access to healthcare further contribute to the persistence of these diseases in endemic areas. Additionally, international travel and trade can facilitate the global spread of parasitic pathogens, as seen in imported cases of toxoplasmosis or echinococcosis.

Combatting zoonotic parasitic diseases requires a multi-sectorial approach that includes improved surveillance, early diagnosis, vector control, food safety and public education. Mass deworming programs, especially in rural and underprivileged communities, have shown positive impacts in controlling helminthic infections. Strengthening veterinary public health services is also essential, as monitoring animal populations for parasitic infections can help prevent outbreaks in human populations. The "One Health" approach, which recognizes the interconnectedness of human, animal and environmental health, offers a comprehensive framework for addressing the complex challenges posed by zoonotic parasitic diseases.

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