



Zoonotic Parasites: Transmission Between Animals and Humans and Their Public Health Importance

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DESCRIPTION

Zoonotic parasites are parasitic organisms that can be transmitted naturally between animals and humans. They occur in many environments and involve complex relationships among people, domestic animals, wildlife, insects, soil, water, and food [1]. Some zoonotic parasites spend part of their life cycle in animals before reaching humans, while others require several hosts to complete their development. Their effects on people range from mild gastrointestinal illness to infections involving the liver, lungs, nervous system, muscles, skin, or other tissues. Understanding these parasites requires consideration of both human and animal health because changes in one part of the transmission cycle can influence infection in another [2].

Many zoonotic parasites have life cycles involving definitive and intermediate hosts. The definitive host is the organism in which the parasite reaches its adult stage or completes sexual reproduction. An intermediate host supports one or more earlier developmental stages [3]. Humans may sometimes act as accidental hosts when they become infected but do not normally contribute to the parasite's natural transmission cycle. This distinction is important because the clinical effects in humans may differ from the usual effects in the parasite's primary hosts [4].

Toxoplasma gondii is a widely studied zoonotic protozoan parasite. Cats and other members of the feline family serve as definitive hosts, while many warm-blooded animals can carry tissue stages. Humans may become infected through consumption of undercooked meat containing tissue cysts, ingestion of material contaminated with infectious forms, or other routes [5]. Infection in healthy individuals is often mild or unnoticed, but serious complications can occur in people with weakened immune defenses. Infection acquired during pregnancy can also affect the developing fetus [6].

Echinococcus species are zoonotic tapeworms associated with dogs, wild canids, livestock, and other animals. Dogs can carry adult worms in their intestines and release eggs through feces.

Humans may ingest these eggs through contaminated hands, food, water, or environmental surfaces. Larval stages can then develop in human tissues, producing cystic or other forms of echinococcosis. The liver and lungs are commonly affected, although other organs can also be involved [7].

Taenia solium has an important relationship with both humans and pigs. Humans can develop an intestinal tapeworm infection after eating undercooked pork containing larval cysts. However, ingestion of parasite eggs can result in cysticercosis, in which larval forms develop within human tissues. When cysts affect the brain, neurocysticercosis may occur. This condition can produce seizures and other neurological problems depending on the location and number of cysts [8].

Trichinella species are transmitted through the consumption of raw or insufficiently cooked meat containing encysted larvae. Wild animals such as wild boar can participate in transmission, and domestic pigs may also become infected under particular conditions. After humans consume infected meat, adult worms develop in the intestine and produce larvae that migrate into skeletal muscles. Infection can cause gastrointestinal symptoms followed by muscle pain, fever, weakness, and other inflammatory manifestations [9].

Giardia duodenalis can infect humans and numerous animal species. Different genetic groups of *Giardia* have varying host ranges, and some can infect both animals and humans. Transmission commonly occurs through ingestion of cysts in contaminated water, food, or environmental material. Domestic animals, livestock, wildlife, and humans can contribute to contamination depending on local conditions. Safe water, sanitation, hand hygiene, and appropriate animal management can reduce transmission [10].

CONCLUSION

Zoonotic parasite transmission is strongly influenced by environmental conditions. Temperature, rainfall, vegetation, soil characteristics, water availability, wildlife populations, and

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human settlement patterns can affect the survival and movement of parasite stages. Changes in land use can bring humans, domestic animals, and wildlife into closer contact. Agricultural expansion, urban growth, deforestation, and movement of animals can therefore alter opportunities for parasite transmission. Domestic animals can play different roles in zoonotic parasite cycles. Dogs and cats may act as definitive hosts for particular parasites, while livestock may serve as intermediate hosts. Animals can also carry parasite stages on their bodies or contaminate environments through feces.

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