






What it is:

A zoonotic parasitic disease caused by the larval stage of a parasite belonging to the genus *Echinococcus*, family Taeniidae (tapeworms), class Cestoda.

The two main forms affecting humans are **Cystic Echinococcosis** (caused by *Echinococcus granulosus sensu lato*) and **Alveolar Echinococcosis** (caused by *Echinococcus multilocularis*).

This disease is significant for both human and animal health and has **major economic implications** due to the costs associated with diagnosis, treatment in humans, surveillance activities, and losses related to animal mortality and reduced productivity.

Categories

CYSTIC ECHINOCOCCOSIS	ALVEOLAR ECHINOCOCCOSIS
   <p>DOMESTIC CANIDS WILD CANIDS SHEEP</p> <p>The main reservoir hosts (definitive hosts) are domestic and wild canids, while the intermediate hosts are domestic ruminants.</p> <p>Ovines are particularly important in the parasite's life cycle, as farming practices often involve close contact between intermediate and definitive hosts, thereby facilitating transmission of the infection.</p>	  <p>WILD CANIDS RODENTS</p> <p>The primary reservoir hosts (definitive hosts) are foxes and other wild canids, while rodents serve as intermediate hosts.</p>

Origin and transmission

Echinococcus is a **flatworm measuring only a few millimeters in length**. It is transmitted through a **life cycle that involves both an intermediate host and a definitive host**. In its adult stage, the parasite resides in the small intestine of definitive hosts. Microscopic eggs are released into the environment through the faeces of infected animals which can in turn contaminate food, water, or surfaces. When ingested by intermediate hosts, the **eggs develop into larvae** that form hydatid cysts **in organs such as the liver and lungs**, impairing their function. The cycle is completed when a new definitive host ingests infected offal from infected intermediate hosts, thereby acquiring the parasitic cysts, which then mature into adult tapeworms in the small intestine.

CYSTIC ECHINOCOCCOSIS: The life cycle develops **between the definitive host** (domestic dogs and wild canids) **and intermediate hosts**, primarily sheep, cattle, and pigs.

ALVEOLAR ECHINOCOCCOSIS: The cycle involves wild **canids**, such as foxes and wolves, **acting as definitive hosts**, and small **rodents acting as intermediate hosts**.

Humans are accidental hosts in both diseases. **Transmission to humans** occurs via the **hand-to-mouth route**, through ingestion of contaminated food or water, or through contact with food, fomites, or environments contaminated with faeces from definitive hosts containing *Echinococcus* eggs.



Symptoms and impact

ANIMALS	HUMANS
<p>CYSTIC ECHINOCOCCOSIS</p> <p>In animals, the infection is generally asymptomatic or may present with nonspecific clinical signs such as weight loss, reduced productivity, weakness, and, in severe cases, hepatic failure.</p> <p>Due to the chronic nature of the disease, livestock are typically slaughtered before cysts cause serious clinical issues.</p> <p>In dogs, symptoms may include diarrhea or intestinal disorders, but the infection often goes unnoticed.</p> <p>ALVEOLAR ECHINOCOCCOSIS</p> <p>In wild animals such as foxes, the infection is often asymptomatic, although it can cause hepatic damage in infected rodents.</p>	<p>Individuals at the highest risk of infection include farmers, livestock breeders, hunters, and people living in rural areas with close contact with intermediate hosts and poor hygienic practices. The disease typically follows a chronic and asymptomatic course. Diagnoses are often incidental, made during imaging procedures conducted for unrelated reasons. If left untreated, these parasitic infections can lead to severe complications. The mortality rate ranges between 1% and 3%.</p> <p>CYSTIC ECHINOCOCCOSIS</p> <p>Symptoms depend on the affected organ. Hepatic cysts may cause abdominal pain, nausea, and jaundice, while pulmonary cysts can lead to cough, chest pain, and respiratory distress. If a cyst ruptures, the parasite can spread to other organs and result in severe complications if left untreated.</p> <p>ALVEOLAR ECHINOCOCCOSIS</p> <p>This more severe form behaves like an infiltrative tumour, primarily affecting the liver. Symptoms include abdominal pain, weight loss, and jaundice. If left untreated, it can spread to other organs and lead to death.</p>

Geographical distribution

Cystic Echinococcosis: Widespread globally, particularly in livestock-rearing regions of **South America, Africa, Asia, and Europe**. In **Italy**, the disease has been documented for a long time, especially in southern and island regions **where sheep farming is more prevalent**.

Alveolar Echinococcosis: Common in **Central Europe, Russia, China, and North America**. In **Italy**, it is primarily found in **northern regions**, where foxes and other wild canids are more prevalent.

Additionally, the recent detection of the parasite in **Croatia and Serbia** suggests an **expansion of its geographical range**.

Preventive measures

Hygiene, preventing infection in definitive hosts, and surveillance. Washing fruits and vegetables, avoiding untreated water, and handwashing after contact with animals are essential preventive measures. **Regular deworming of dogs** with praziquantel is recommended and, in the case of alveolar echinococcosis, medicated baits may also be used for wild canids. **Proper carcass disposal and community education** in at-risk areas help reduce parasite transmission. Monitoring during slaughterhouse procedures and case notification remain critical components of disease control. **In humans, treatment is prolonged and costly**, involving surgery and pharmacological therapies, with a significant impact on both quality of life and the economic burden on healthcare systems.

References:

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