

Tapeworms and hydatid disease

The term 'tapeworm' describes a group of parasitic worms that live in the gut of animals, including humans. These infestations are found worldwide. They can be caused when humans consume raw or undercooked animal products that contain worm larvae (for beef or pork). Humans can also become infested after close contact with animals like cats and dogs.

In Australia the most serious locally acquired form of tapeworm infestation is caused by the hydatid tapeworm (*Echinococcus granulosus* or *E. granulosus*), which can infect dogs and dingoes, particularly in sheep farming areas.

A person who comes in contact with the faeces of an infected dog (that is, when eggs from the tapeworm are passed in the faeces) may develop hydatid disease. This is serious and potentially fatal. Infection with tapeworm eggs causes cysts to form in vital organs such as the liver and lungs.

Life cycle of a tapeworm

The tapeworm needs two hosts to complete its life cycle:

- **Intermediate host** – such as sheep, pigs, cattle, goats, horses, camels, wallabies and kangaroos. Infection begins when the grazing animal eats dog or dingo faeces infected with tapeworm eggs. The eggs hatch in the animal's gut into embryos (called oncospheres). These embryos penetrate the wall of the intestine and are carried in the bloodstream to vital organs such as the liver, lungs or brain, where they can develop into watery 'blisters' called hydatid cysts. These cysts contain around 30 to 40 tapeworm heads (the first segment of the tapeworm). A mature fertile cyst may contain several million such heads.
- **Definitive host** – such as dogs and dingoes. Infection begins when the animal eats offal that contains hydatid cysts. The swallowed cysts burst and the tapeworm heads travel to the gut and attach themselves to the intestine wall. The tapeworms are mature after about six weeks. An adult *E. granulosus* tapeworm is only six millimetres long. Thousands can inhabit the gut of an infected animal. Each mature worm grows and sheds the last segment of its body about every two weeks. This last segment contains immature eggs. The eggs are passed from the animal's body in faeces and may stick to the animal's hair or contaminate the vegetable garden. The eggs are highly resistant to weather conditions and can remain viable for months. The eggs have to be swallowed by an animal (intermediate host) to form hydatid cysts.

Infection in humans

Human infection does not occur from eating infected offal. People usually become infected by accidentally swallowing the tapeworm eggs passed in dog faeces. A human acts as an intermediate host in the same way as a sheep, horse or kangaroo. The eggs travel through the bloodstream, lodge in organs and form watery cysts full of tapeworm heads. This is known as hydatid disease or echinococcosis. Hydatid disease is not contagious and is not passed by person-to-person contact.

Symptoms

The symptoms of hydatid disease depend on which organs are affected. The most commonly affected organ is the liver. The kidneys, brain and lungs are sometimes affected. In rare cases, hydatid cysts may form in the thyroid gland or heart or within bone.

Symptoms can occur a long time after infection, sometimes months or years later. Sometimes there are no symptoms at all. If they occur, symptoms may include:

- Stomach upset
- Diarrhoea
- Unexplained weight loss
- Swollen abdomen
- Anaemia
- Weakness and fatigue
- Cough
- Blood or the fluid from a ruptured cyst – may be coughed up
- Jaundice – pressure from an enlarging cyst may cause jaundice.

Hydatid disease can be fatal without medical treatment. A heavily infested organ may fail or a cyst may rupture and cause a life-threatening allergic reaction (anaphylaxis).

Diagnosis methods

Diagnosis of hydatid disease may include:

- Medical history
- Physical examination
- X-ray examination
- Ultrasound
- CT scan
- MRI scan
- Examination of blood, urine, sputum, faeces or other bodily fluids if a burst hydatid cyst is suspected
- Blood tests for antibodies to the cysts.

Treatment options

Surgery is the main form of treatment for hydatid disease. A risk of surgery is that a hydatid cyst may rupture and spread tapeworm heads throughout the patient's body. To reduce this risk, the doctor may prescribe high doses of the drug albendazole in conjunction with surgery. This drug helps to destroy any remaining tapeworm heads. However, risk of disease recurrence is high. About one in three people treated for hydatid disease develop the condition again and need repeat treatment.

Preventing infection

Both phases of the tapeworm's life cycle must be broken in order to prevent infection. Suggestions include:

- It is important to control tapeworm infection in domestic dogs. Infected dogs usually don't have any symptoms. Don't assume that your dog isn't infected just because it seems happy and healthy.
- Regular preventive deworming of dogs is important, especially in rural areas where dogs may have access to animal carcasses.
- Take your dog to the vet for diagnosis and treatment (if necessary) for tapeworm infection. Treatment includes regular dosing with anti-tapeworm medicines.
- While your dog is undergoing treatment, dispose of its faeces carefully. Wear rubber gloves. Incinerate or bury deeply all dog droppings for at least three days. Wash your hands thoroughly after disposing of dog droppings.
- Thoroughly clean and disinfect the kennel and surrounding area.
- Always wash your hands with plenty of soap and water after touching your dog. Instruct children to do the same. Supervise small children when they wash their hands.
- Wash hands before eating, drinking and smoking and after gardening or handling animals.
- Only feed your dog with commercially prepared dog foods.
- Do not feed raw or cooked offal to your dog. This includes offal bought from a supermarket or butcher.
- Be especially vigilant if you are a sheep or cattle farmer. For example, keep your dog fenced or on a lead when it is not working to prevent it from eating carcasses.
- Do not allow your dog to roam when holidaying in country areas.
- If you grow your own vegetables, fence your vegetable patch to make sure that pets and wild animals can't defecate on the soil.

Where to get help

- Your doctor
- Chemist
- Vet

Things to remember

- Contact with dog faeces infected with tapeworm eggs may cause hydatid disease, which is when cysts form in vital organs such as the liver.
- It is important to control tapeworm infection in domestic dogs – take your dog to the vet for treatment with anti-tapeworm medication.
- Wash hands before eating, drinking and smoking and after gardening or handling animals.

This page has been produced in consultation with, and approved by:

Department of Health - Communicable Disease Prevention and Control Unit

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