Cysticercosis

Epidemiology in New Zealand

Cysticercosis, taeniasis and hydatids are a subset of ‘cestode’ (tapeworm infection) and are all notifiable. Taeniasis and hydatids are discussed in separate chapters.

Tapeworm infection causes two clinical syndromes in humans:
- mature tapeworm infestation in the gut
- larval cysts embedded throughout the body, causing hydatosis, cysticercosis, coenurosis or sparganosis.

Cysticercosis refers to disease in the tissues caused by the larval stage of one species of tapeworm – *Taenia solium*. Ingested eggs hatch in the small intestine, and the larvae migrate to various tissues and organs, particularly in the central nervous system (neurocysticercosis), and form cysts. These eventually degenerate and become calcified granulomata.

Taeniasis (discussed separately) refers to intestinal infection by adult tapeworms of the genus *Taenia* (for example, *T. saginatum, T. solium*).

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz

Case definition

Clinical description

Cysticerci can cause symptoms by compression or inflammation. Outside the central nervous system, they are generally asymptomatic and, when calcified, present only as an incidental radiological finding. In the brain and spinal cord, however, cysticerci can be associated with mass effects (for example, sensorimotor or cognitive deficits), seizures, hydrocephalus, chronic meningitis and spinal cord compression. Cysticercosis can cause serious disability but has a low case-fatality rate. The clinical diagnosis of neurocysticercosis can be made by computed tomography (CT) or magnetic resonance imaging (MRI) of the brain or spinal cord.

Laboratory test for diagnosis

**Laboratory confirmation requires** microscopic identification of excised cysticerci (or from tissue biopsies).
Antibodies to *T. solium* in serum or cerebrospinal fluid can also be identified. Newer ELISA tests may be available and are two to three times as sensitive, with a sensitivity of 95 percent and specificity of 99 percent. Serology has low sensitivity when cysts are not multiple and negative serology should not exclude the diagnosis. Use should be discussed with ESR on a case-by-case basis.

Radiological investigations (plain X-rays, CT, MRI) are considered superior to antibody testing.

Note: Microscopic identification of proglottids or eggs in the faeces or in the perianal region is also used in the diagnosis of taeniasis, but is not diagnostic of cysticercosis.

### Case classification

- **Under investigation**: A case that has been notified, but information is not yet available to classify it as probable or confirmed.
- **Probable**: A clinically compatible illness that is not laboratory confirmed but has distinctive radiological features and occurs in a person who has lived in an endemic area.
- **Confirmed**: A clinically compatible illness that is laboratory confirmed.
- **Not a case**: A case that has been investigated and subsequently found not to meet the case definition.

### Spread of infection

#### Incubation period

The time between infection and onset of symptoms can vary from weeks to 10 years or more after infection.

#### Mode of transmission

Cysticercosis is acquired either by ingestion of *T. solium* eggs shed in the faeces of another case (including indirectly via food contamination) or by ingestion of *T. solium* eggs shed in a case's own faeces (auto-inoculation). *T. saginata* eggs are not infectious to humans.

#### Period of communicability

Larvae remain viable in animal tissues for years. Adult tapeworms may live in the human intestine and shed eggs for up to 25 years, growing up to 8 metres in length. *T. solium* eggs are infectious both to humans and to pigs. Eggs may remain viable in the environment for months.
Notification procedure
Attending medical practitioners or laboratories must immediately notify the local medical officer of health of suspected cases. Notification should not await confirmation.

Management of case

Investigation
Obtain a history of travel, possible contacts and consumption of raw or undercooked beef or pork. Ensure laboratory confirmation has been attempted.

Restriction
Nil before isolation. However, *T. solium* cross-infection could occur via the faecal-oral route.

Counselling
Advise the case and their caregivers of the nature of the disease and its mode of transmission. Educate about hygiene, especially hand cleaning.

Management of contacts

Definition
A person with the same history as the case of consuming raw or undercooked beef or pork. Contacts also include people potentially exposed to eggs via faecal-oral contamination.

Investigation
Advise contacts to visit their general practitioner to arrange laboratory testing, including testing for the adult worm (for example, stool testing for eggs and parasites). The laboratory needs to be informed of the history of overseas travel or other risks. For faecal testing, normally three samples are required.

Restriction
Nil.

Prophylaxis
Nil.

Counselling
Nil.
Other control measures

Identification of source
If the case contracted cysticercosis in New Zealand, liaise with the Ministry for Primary Industries to investigate potential animal sources of infection.

Disinfection
Nil.

Health education
Advise on hygienic food handling and the health dangers of consuming raw or undercooked meat.

Public education may be indicated to prevent faecal contamination of soil, water and food for humans and animals. Avoid the use of sewage effluents for pasture irrigation.

Freezing pork or beef below −5°C for more than 4 days effectively kills cysticerci, as does appropriate irradiation.

Reporting
Ensure that complete case information is entered into EpiSurv.

On receiving a notification of a case who may have acquired the infection in New Zealand, medical officers of health should immediately notify the Director of Public Health at the Ministry of Health.

The Ministry of Health will notify the appropriate staff in the Ministry for Primary Industries so that further investigation of a potential animal source can be undertaken.

References and further information