Cysticercosis

Cysticercosis is an infection caused by the pork tapeworm (*Taenia solium*). Infection occurs when the tapeworm larvae enter the body and form cysts *(cysticerci*). When cysts are found in the brain, the condition is called neurocysticercosis. Symptoms vary from case to case. If cysts are located in the brain, central nervous system abnormalities may occur. Most often these symptoms are seizures and headaches. Cysticercosis may also affect the eyes, spinal cord, skin and heart.

CAUSES

The tapeworm that causes cysticercosis is found worldwide. Infection is found most often in rural, developing countries with poor hygiene where pigs are allowed to roam freely and eat human feces. This allows the tapeworm infection to be completed and the cycle to continue.

You can become infected with cysticercosis by accidentally swallowing pork tapeworm eggs. Tapeworm eggs are passed in the bowel movement of a person who is infected. These tapeworm eggs are spread through food, water, or surfaces contaminated with feces. This can happen by drinking or eating contaminated water or food. Contamination can also occur by putting contaminated fingers to your mouth. A person who has a tapeworm infection can reinfect themselves. Once inside the stomach, the tapeworm egg hatches, and penetrates the intestine. It can then travel through the bloodstream and may develop into cysts in the muscles, brain, or eyes.

Cysticercosis is not spread from person to person. A person infected with the intestinal tapeworm stage will shed tapeworm eggs in their bowel movements. Tapeworm eggs that are accidentally swallowed by another person can cause infection.

SYMPTOMS

Signs and symptoms will depend on the location and number of cysts in your body.

Cysts in the muscles:

- Cysts in the muscles generally do not cause symptoms. However, you may be able to feel lumps under your skin.

Cysts in the eyes:

- Although rare, cysts may float in the eye and cause blurry or disturbed vision. Infection in the eyes may cause swelling or detachment of the retina.

Neurocysticercosis (cysts in the brain, spinal cord):

- Symptoms depend upon where and how many cysts (often called lesions) are found in the brain. Seizures, and headaches are the most common symptoms. These symptoms may also occur:
  - Confusion.
  - Lack of attention to people and surroundings.
  - Difficulty with balance.
  - Swelling of the brain (*hydrocephalus*) may also occur.

Death can occur suddenly with heavy infections.

Symptoms can occur months to years after infection. Symptoms usually occur when the cysts are in the process of dying. When this happens, the brain can swell. The pressure caused by swelling is the cause of most symptoms of neurocysticercosis. Most people with cysts in muscles will not have symptoms of infection.

DIAGNOSIS

Diagnosis can be difficult and may require several testing methods. Your health care provider will ask you about where you have traveled and your eating habits. Diagnosis of neurocysticercosis is usually made by MRI or CT brain scans. Blood tests are available to help diagnose an infection. Blood tests may not always be accurate. If surgery is necessary, confirmation of the diagnosis can be made by the laboratory.
Family members may also be tested. Your health care provider may ask you to submit several stool specimens over several days or to examine your stools for evidence of a tapeworm.

TREATMENT

Infections are generally treated with anti-parasitic drugs in combination with anti-inflammatory drugs. Surgery is sometimes necessary to treat cases in the eyes, cases that are not responsive to drug treatment, or to reduce brain swelling. Not all cases of cysticercosis are treated.

Often, the decision of whether or not to treat neurocysticercosis is based upon the number of lesions found in the brain and the symptoms you have. When only one lesion is found, often treatment is not given. If you have more than one lesion, specific anti-parasitic treatment is generally recommended. If the brain lesion is considered *calcified* (this means that a hard shell has formed around the tapeworm larvae), the cyst is considered dead. Specific anti-parasitic treatment is not beneficial. As the cysts die, the lesion will shrink. The swelling will go down, and often symptoms (such as seizures) will go away.

PREVENTION

- Avoid eating raw or undercooked pork and other meats.
- Do not eat meat of pigs that are likely to be infected with the tapeworm.
- Wash hands with soap and water after using the toilet and before handling food, especially when traveling in developing countries.
- Wash and peel all raw vegetables and fruits before eating. Avoid food that may be contaminated with feces.
- Drink only bottled or boiled (1 minute) water or carbonated drinks in cans or bottles. Do not drink fountain drinks or any drinks with ice cubes. Another way to make water safe is by filtering it through an "absolute 1 micron or less" filter AND dissolving iodine tablets in the filtered water. "Absolute 1 micron" filters can be found in camping/outdoor supply stores.

SEEK IMMEDIATE MEDICAL CARE IF:

- You have seizure.
- You feel faint or pass out.
- You become confused or are acting unlike your normal self.
- You develop problems with your vision.

Information courtesy of the CDC.

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