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E. cuniculi

What is *E. cuniculi*?

Encephalitozoon cuniculi, or *E. cuniculi*, is a microsporidian infection in pet rabbits. It was previously considered a parasite but now is widely considered to be a fungal organism. It can cause nerve, eye, and kidney damage in pet rabbits.

E. cuniculi is now considered to have zoonotic potential, which means there is the possibility of spread from an infected rabbit to a human and the potential to cause disease in people (microsporidiosis).

How is *E. cuniculi* spread?

The most common ways pet rabbits get infected are by transmission from an infected doe (mother) to the fetus through the placenta, and through ingestion or inhalation of infectious spores shed in the urine. Spores are environmentally resistant and difficult to destroy, but are susceptible to bleach (0.1% with 10 minute contact time) and hydrogen peroxide (1% with 30 minute contact time).

What happens after exposure?

The organism may simply pass through the rabbit's system without causing infection, or the organism may infect the rabbit's tissues and may or may not cause disease. *E. cuniculi* has a predilection for certain tissues including the brain, kidney, lung, lens of the eye, and the heart.

What symptoms are seen?

Many, if not most, infected rabbits will never show any symptoms of disease. However, *E. cuniculi* is believed to be associated with tissue damage to the neurologic system, eyes, and kidneys.

Neurologic System – Neurologic symptoms include vestibular disease (loss of balance or coordination, often manifested with a head tilt, circling, or body rolling), seizures, blindness, and spinal cord damage.

Eye – *E. cuniculi* can result in rupture of the lens of the eye, leading to inflammation in the eye (phacoclastic anterior uveitis) and other eye damage.

Kidney – *E. cuniculi* is believed to be associated with chronic kidney damage. This may not be clinically evident until later in life when irreversible kidney insufficiency or renal failure becomes apparent.

How is *E. cuniculi* diagnosed?

The diagnosis of *E. cuniculi* can be very challenging. Rabbits that are exposed, but not necessarily infected or sick, can have a high blood titer (antibody level) for years. Other blood tests (eg. acute phase protein measurement) can be helpful but are not always conclusive. A negative titer effectively rules out infection. A positive titer indicates exposure but not necessarily active disease.

For the *E. cuniculi* titer blood test, a small sample of blood is drawn from a vein and submitted to an outside lab. Results take about a week to return.

Can *E. cuniculi* be treated?

Yes. *E. cuniculi* infection can be treated with oral medication. Medications are targeted at killing the organism, but may not repair tissue damage that has already been done. Therefore, the symptoms (if any) may or may not improve after treatment. Other medications (eg. anti-inflammatories) may be prescribed to treat symptoms associated with infection (if any).

The most common medication used for the treatment of *E. cuniculi* is fenbendazole (Panacur) which is available as a prescription in an oral liquid form. Rabbits are generally medicated once a day for 10 or 28 days, depending upon the treatment objectives. In one experimental study in research rabbits, treatment for 28 days resulted in no spores being found in brain tissue at the end of the study. In a separate study of pet rabbits with neurologic symptoms, rabbits medicated with fenbendazole had improved survival rates by day 10, better neurologic scores, and improved long-term survival. How long to treat an individual pet rabbit is a personal decision that should be discussed with the rabbit's veterinarian.

Are there treatment risks?

Yes. Although side effects are rare, there are reports of bone marrow suppression and even death in pet rabbits that were treated with fenbendazole or other benzimidazole drugs (eg. albendazole). Therefore, rabbits are generally not simply treated prophylactically with these medications at the present time. A blood test (titer) can be helpful to rule OUT infection. If the test is negative, the rabbit does not need this medication. Baseline and weekly CBCs (complete blood counts) can be considered to closely monitor rabbits during and after treatment.