ENCEPHALITOZOON CUNICULI

Encephalitozoon Cuniculi (E. cuniculi) has been one of the hottest topics in rabbit health over the past few years. It's also remains one of the most controversial! Knowledge is constantly evolving and whilst some opinions differ on how serious the parasite is, there are many things we now know about it.

We know that E. cuniculi infection is very common in apparently healthy pet rabbits (see later in this article) and that it can cause a host of clinical symptoms.

WHAT IS E. CUNICULI?

It's a parasite - a small protozoan that lives inside the body cells of its host. It doesn't just infect rabbits: cases have been reported in sheep, goats, dogs, cats, monkeys, guinea pigs, foxes, pigs and humans. It is a recognised zoonosis (disease which can be transmitted to humans), but the zoonotic risk seems to be negligible to healthy individuals observing basic hygiene.

DOES E. CUNICULI OCCUR IN BRITAIN?

Yes, it does, and we now know it is widespread in the UK.

A major research project run in 2006 by veterinary surgeon, Emma Keeble at Edinburgh Vet School (and supported financially by the Rabbit Welfare Fund), set out to determine what percentage of 'healthy' British pet rabbits that have exposed to E. cuniculi.

The results of the project found that 52% of apparently healthy rabbits had been exposed to E cuniculi infection. The rabbits used in the study were blood tested at the time of neutering and showed no clinical symptoms of an E. cuniculi infection. It is not known what percentage of the positive rabbits went on to develop any health problems associated to the parasite.

HOW DO RABBITS GET INFECTED WITH E. CUNICULI?

A lot of rabbits are infected in the womb via the placenta (transplacental infection). The other route of infection is orally via ingestion of urine contaminated by E. cuniculi spores. One month after infection, a rabbit will start to shed spores in its urine. Shedding of spores continues for up to three months and possibly on and off for life. The spores are tough and remain in the environment for more than a month.

WHAT HAPPENS WHEN A RABBIT BECOMES INFECTED?

When a rabbit is first infected, the parasite is absorbed from the intestines. Once inside the body, it heads off to other 'target' organs, especially the kidneys and brain, where it causes lesions called "granulomas". These can be found in the kidneys of rabbits only a few months old. Granulomas may develop in other parts of the body, such as the liver, as well as in the brain.

The infection may remain in a dormant phase for months, years or never cause the rabbit any problems throughout its life. Stress, either physical or psychological seems to be a major trigger factor in the infection becoming active and causing clinical signs.

WHAT KIND OF PROBLEMS CAN E. CUNICULI CAUSE?

Renal (kidney) granulomas may lead to chronic renal failure with problems such as increasing thirst and weight loss. However, it's the lesions in the brain that tend to cause problems. The range of possible neurological presentations are immense but some examples are:

- **Convulsions (fits)**
- **Tremors**
- **Torticollis (head tilt)**
- **Hind limb weakness (ataxia)**
- **Coma or even death**
- **Urinary incontinence (caused by the central nervous system lesions, not those in the kidney).**
- **Loss of balance**

E. cuniculi can also affect the eyes. If unborn baby rabbits become infected via the placenta, granulomas may develop around the lens and cause problems after birth such as Uveitis (inflammation of the Uvea of the eye). Affected rabbits sometimes have white patches visible in the eye.

One of difficulties in trying to decide whether E. cuniculi is the cause of any specific problem is that every one of these problems has other possible causes and therefore a definite diagnosis is often not possible to be certain of by clinical signs alone.

HOW WOULD I KNOW IF MY RABBIT HAS E. CUNICULI?

Antibodies to E. cuniculi can be detected on a blood test. Hence, a rabbit that has been infected to E cuniculi will produce antibodies that will produce a positive test. However, some rabbits appear to clear the infection completely and over time their blood test will become negative again.

A negative result basically rules out E. cuniculi as the cause of the illness, but it is wise to repeat the bloods after 4 weeks to ensure the first blood sample wasn't taken too early in the disease process as the rabbit may not have seroconverted and begun producing antibodies. If a second blood test is negative then this rules E. cuniculi out as the cause of disease.

Some laboratories are now able to offer a more comprehensive test is to measure two stages of the antibodies, known as the IgG and IgM levels. The IgM level is the first to be produced after infection. This will begin to decrease as the IgG level increase, which is the long term response for immune status. Two blood samples 4 weeks apart should be taken so the results can be compared to look for a rising titre indicating active infection and a diagnosis of E. cuniculi.

IS THERE ANY TREATMENT FOR E. CUNICULI?

Yes. If a diagnosis of E. cuniculi is confirmed or strongly suspected then the standard treatment is with Fenbendazole (Panacur), once daily for 28 days at a dose rate of 20mg/kg. This aims to kill the parasite. However, the rabbit's clinical signs may or may not improve, since the inflammation in the brain caused by the parasite may be irreversible.

Depending upon the rabbits clinical symptoms, they may require syringe feeding, fluid therapy, prokinetic medication, antibiotics and analgesia to support them whilst the Fenbendazole treatment is implemented.

It is also vitally important to stop the rabbit/s re-infecting themselves during the treatment. Routine cleaning of the rabbit's accommodation with a cleaning disinfectant such as Anigene (previously Trigene) or Vanodine which claim to be effective against E. cuniculi is strongly advised. The dilution rates and cleaning protocol should be followed carefully to ensure safety and effective disinfectant.

IS THERE ANY RISK TO HUMAN HEALTH?

As aforementioned E. cuniculi is a zoonosis. However, it is only worth noting the risks for those individuals who are immunocompromised. For example, there are reports of people with AIDS suffering from E. cuniculi infection. People with normal immune systems don't need to worry. If you have a medical condition that makes you severely immunocompromised, it is a wise idea to speak to your doctor and also your 'rabbit friendly' veterinary surgeon.

SHOULD I TREAT MY RABBIT ROUTINELY?

The RWAF does not advocate regular use of worming products for rabbits, i.e. every quarter, as is recommend for cats and dogs. However there are times when the use of 9 day courses might be helpful:

To reduce the risk of infection at that specific time, such as, around introductions for short periods of time e.g. for a mating

To suppress chronic infections and reduce the signs associated with them. This is not backed up by any scientific studies, but it is often reported by rabbit owners that improvement occurs within a few days of regular periodic treatments. This could be coincidental, or due to other factors, but requires more work to investigate.

When bonding rabbits it is suggested to treat all rabbits involved in the bond with the longer 28 day course of Fenbendazole either before or during the bond. As aforementioned it is possible to also blood test first and only treat those rabbits that test positive, but if cost is an issue then it is recommended to treat prophylactically on the assumption that either or both rabbits may be infected.

IF ONE OF A BONDED PAIR OF RABBITS HAS DIED FROM E. CUNICULI SHOULD THE SURVIVOR BE TREATED?

Treating the survivor with a 28 day course of Fenbendazole would be a wise idea if a partner had died of symptoms associated with the parasite.

CAN I VACCINATE MY RABBIT AGAINST E. CUNICULI?

Unfortunately there is no vaccine available against E. cuniculi and as far as we are aware no plans in the pipeline either.

WHAT'S THE UPSHOT?

Rabbit owners do need to be aware of the potential problem, but should try not to get too paranoid. All of the clinical signs can be attributed to other disease processes but E. cuniculi should always be high up the differential diagnosis list.

Many of those rabbits diagnosed with disease caused by E. cuniculi can go on to lead normal lives after treatment.

REFERENCES AND FURTHER READING

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