

Coccidia in kangaroos

Fact Sheet

July 2011

Introductory statement

Coccidia are protozoan parasites which infect the intestinal tract of many animals. Within kangaroos, coccidia infections can lead to clinical disease known as coccidiosis. Occasional outbreaks have been reported with high mortality rates in macropods, however coccidiosis is primarily a disease of hand reared juvenile kangaroos (Burdiarso et al. 1971; Barker et al. 1972, Beveridge 1993).

Aetiology

Coccidiosis is an enteric disease caused by infection of coccidian parasites. Within kangaroos the species within the genus *Eimeria* are most often the causative agent.

Family (*Eimeriidae*), genus (*Eimeria*).

Natural hosts

All animals, particularly herbivores, appear to be natural hosts for coccidian species with a high degree of host specificity observed.

Eimeria spp. have been recorded from several genera of *Macropodidae* including the eastern grey kangaroo (*Macropus giganteus*), western grey kangaroo (*M. fuliginosus*) and rock wallabies (*Petrogale* spp.) (Baker et al. 1988; Barker et al. 1989; O'Callaghan et al. 1998). Disease can occur in macropods of all ages but juveniles are more susceptible (Barker 1972, Beveridge 1993).

World distribution

Coccidiosis in mammals occurs throughout the world.

Occurrences in Australia

Coccidiosis in kangaroos is widespread throughout Australia.

Epidemiology

Coccidia are transmitted directly through the faecal-oral route. Environmentally resistant oocysts are passed in the faeces and become infective after a short period of development called sporulation (Speare et al. 1977). These parasites predominantly infect the cells of the mucosa of the small intestine which can cause enteritis. Immunity may develop after infection of a particular species of coccidian, however cross immunity is not apparent. Exposure to a different species of

coccidia can therefore result in a repeat of disease (Bowman 2003). Eastern grey kangaroos appear to be more susceptible to coccidiosis with recorded outbreaks, particularly when animals are in confined spaces and stressed or undernourished (Burdiaso et al. 1971; Barker et al. 1972; Ladds 2009). Mortality rates are particularly high in hand reared juveniles.

Clinical signs

Clinical signs can include depression, lethargy, abdominal discomfort, anorexia, bloody diarrhoea and dehydration (Ladds 2009; Vogelnest and Portas 2008). Death and disease can also occur with no clinical signs.

Diagnosis

- Oocysts present in faecal samples – although not always indicative of disease.
- Direct microscopy examination of wet smears.
- Faecal floatation may also be used to separate oocysts from faecal debris.

Pathology

- Extensive haemorrhagic enteritis, associated with the presence of coccidial life cycle stages in the small intestine.
- Lesions within the small intestine associated with degeneration with oedema or haemorrhage
- Schizonts present in the cells of the lamina propria.

Differential diagnoses

Other causes of gastrointestinal illness, crisis or any condition that may cause lethargy.

Laboratory diagnostic specimens

- Faecal samples for microscopy analysis. Approximately 2-4 g is usually sufficient.
- Faecal samples stored in 2.5% potassium dichromate for oocyst sporulation and subsequent species identification.
- Intestinal tissue samples fixed in 10% formalin for histology.
- Intestinal tissue samples fixed in 70% ethanol for molecular characterisation.

Treatment

Vogelnest and Portas (2009) recommend immediate treatment with toltrazuril (25mg/kg PO sid 3d), along with antibiotic treatment, enrofloxacin (5mg/kg IM or SC sid 5d). Plasma transfusions may also be considered, though there is need for studies on their efficacy. Treatment is often unrewarding in young animals.

Prevention and control

Coccidiosis within wild populations of kangaroos is difficult to prevent or control. Overcrowding and damp conditions enhance survival of oocysts leading to accumulation in the environment (Barker et al. 1972). Plasma transfusions were pioneered by David Blyde at Western Plains Zoo for prevention of disease in hand reared juvenile eastern grey kangaroos in the early to mid-90s.

Surveillance and management

There is no coordinated national program for surveillance of coccidia in kangaroos. However, significant disease outbreaks due to coccidiosis in wild kangaroos would be logged in the national wildlife health information system as part of national general wildlife surveillance activities. Coccidiosis is an endemic disease and therefore not included in AUSVETPLAN.

Wildlife Health Australia administers Australia's general wildlife health surveillance system, in partnership with government and non-government agencies. Wildlife health data is collected into a national database, the electronic Wildlife Health Information System (eWHIS). Information is reported by a variety of sources including government agencies, zoo based wildlife hospitals, sentinel veterinary clinics, universities, wildlife rehabilitators, and a range of other organisations and individuals. Targeted surveillance data is also collected by WHA. See the WHA website for more information <https://wildlifehealthaustralia.com.au/Our-Work/Surveillance> and <https://wildlifehealthaustralia.com.au/Our-Work/Surveillance/eWHIS-Wildlife-Health-Information-System>.

There are no cases of coccidiosis listed in the National Wildlife Health Information System.

Research

- Ascertaining the pathogenicity of individual species of *Eimeria* in different species of macropods.
- Confirming host/species relationships of coccidia with macropod species and host specificity.
- Differentiation of species by PCR would be useful.
- Efficacy of plasma transfusions for prevention and treatment in eastern grey kangaroos and other species.

Human health implications

There are no known zoonotic risks associated with coccidia infecting kangaroos.

Conclusions

Coccidiosis is considered an important disease in hand reared juvenile kangaroos and animals under stress in confined quarters where environmental contamination is high.

References and other information

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