Blastocystis in Australian wildlife

Introductory statement

*Blastocystis* is a protozoan parasite which infects a wide variety of hosts including humans and other mammals, birds, reptiles and amphibians (Tan 2004). This parasite is known to cause intestinal disease in humans and non-human primates. Recent research has identified *Blastocystis* in some species of Australian wildlife but pathogenicity remains undetermined.

Aetiology

Blastocystosis is caused by the protozoan *Blastocystis* sp. Infection may result in gastrointestinal disease in the host.

The taxonomy of *Blastocystis* has often changed due to the unique morphology and cellular components. Molecular characterisation has suggested this protist belongs in the group (Stramenopiles), genus *Blastocystis*.

Natural hosts

*Blastocystis* sp. are known to infect a wide variety of vertebrate hosts including humans, non-human primates, companion animals, livestock, birds, amphibians and reptiles.

World distribution

Occurs throughout the world.

Occurrences in Australia

There are few reports of *Blastocystis* sp. within Australian wildlife most likely due to the difficulty in identifying infection through direct microscopy as cysts can be confused with yeast and faecal debris. However, a recent study using molecular techniques has identified this parasite in the chuditch (*Dasyurus geoffroii*), brushtail possum (*Trichurus vulpecular*), quenda (*Isoodon obesulus*) and woylie (*Bettongia*).
Penicillata) (Parkar et al. 2007). It has also been observed in captive populations of the western grey kangaroo (Macropus fuliginosus), quokka (Setonix brachyurus) and southern hairy nosed wombat (Lasiorhinus latifrons) (Parkar et al. 2010).

Epidemiology

Blastocystis is predominantly transmitted directly through the faecal-oral route however the water resistant cysts can also be transmitted indirectly through contaminated water sources (Tan 2004). Knowledge of the epidemiology of this parasite has largely been focussed on human infections and the various degrees of pathogenicity. Genetic characterisations have identified a number of sub-types (1-12) within the genus and researchers suggest these are linked to the different levels of disease observed (Stensvoldt et al. 2007, Parkar et al. 2010). Within wildlife populations several sub-types have been identified which have also been observed in humans indicating potential zoonotic transmission can occur. To date incubation period, duration of infection and pathogenicity of infection within Australian wildlife is unknown.

Clinical signs

The vast majority of research on Blastocystis infections has involved human patients. Many patients have been asymptomatic while others displayed clinical signs such as diarrhoea, fatigue, nausea and vomiting (Yakoob et al. 2004, Stensvoldt et al. 2007). Clinical signs have not been reported in Australian wildlife.

Diagnosis

- Cysts present in faecal samples.
- Direct microscopy examination of wet smears, formol-ether concentration methods.
- Species identification can be assisted with in vitro culture and PCR protocols.

Pathology

Any potential pathology associated with infection in Australian wildlife is yet to be described. There are no case reports in the Australian Registry of Wildlife Health (www.arwh.org).

Differential diagnoses

Determination of Blastocystis sp. sub-type infecting individual hosts can only be through molecular characterisation.

Laboratory diagnostic specimens

- Fresh faecal samples for microscopy analysis. Approximately 2-4 g is sufficient. Samples can be stored at 4°C for 2-3 days until delivery to the laboratory.
- Faecal samples fixed in 70% ethanol can be used for PCR procedures. Two parts faecal/ 8 parts fixative is sufficient.
Treatment

Treatments for infection of *Blastocystis* sp. in Australian wildlife has not been described. The antibiotic metronidazole has been used as a treatment in humans.

Prevention and control

As *Blastocystis* is primarily transmitted through the faecal oral route and/or through contaminated water sources prevention and control within wildlife populations is limited.

Surveillance and management

Wildlife disease surveillance in Australia is coordinated by Wildlife Health Australia. The National Wildlife Health Information System (eWHIS) captures information from a variety of sources including Australian government agencies, zoo and wildlife parks, wildlife carers, universities and members of the public. Coordinators in each of Australia’s States and Territories report monthly on significant wildlife cases identified in their jurisdictions. NOTE: access to information contained within the National Wildlife Health Information System dataset is by application. Please contact admin@wildlifehealthaustralia.com.au.

The findings of *Blastocystis* in samples from wildlife within Australia would be considered interesting and unusual and would therefore be logged in eWHIS as part of Australia’s National General Wildlife Surveillance System.

Statistics

There are currently no cases of blastocystosis listed in eWHIS.

Research

Current research on *Blastocystis* is focused on elucidating the number of species sub-types existing within host populations. It is hoped that this knowledge will assist in determining the pathogenicity and zoonotic potential of the various sub-type resulting in effective treatment and control of this parasite. A knowledge of the role of Australian wildlife in the epidemiology of *Blastocystis* infection in people would be useful.

Human health implications

Information on the zoonotic aspects of *Blastocystis* infection in people should be sought from your local health care professional.

*Blastocystis* sp. occurs in humans and other animals with many subtypes exhibiting low host specificity, which may contribute to its zoonotic potential (Tan 2004, Abe 2004). Animal handlers have been found to have a higher incidence of infection than those with no animal contact (Salim et al. 1999) and Blastocystis has been isolated from the faeces of zoo-animals and their keepers in Australia (Parker et al. 2010).

Clinical signs in humans are variable with some patients appearing asymptomatic while others display severe abdominal cramps, diarrhoea and fatigue. Research has linked *Blastocystis* with diseases such as Irritable Bowel Syndrome; however, a clear understanding of the pathogenicity of this parasite is lacking (Yakoob et al. 2004, Giacometti et al. 1999).
Conclusions

*Blastocystis* is a protozoan parasite found in a variety of hosts including recent observations from several species of Australian native marsupials. Infection with this parasite has been linked with bowel disease in humans, however little is known about the importance of Australian wildlife the epidemiology of infection in people. Genetic studies are identifying several distinct sub-types which may give insight to zoonotic and disease potential in various hosts including humans.

References and other information


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To provide feedback on this fact sheet

We are interested in hearing from anyone with information on this condition in Australia, including laboratory reports, historical datasets or survey results that could be added to the National Wildlife Health Information System. If you can help, please contact us at admin@wildlifehealthaustralia.com.au.
Wildlife Health Australia would be very grateful for any feedback on this fact sheet. Please provide detailed comments or suggestions to admin@wildlifehealthaustralia.com.au. We would also like to hear from you if you have a particular area of expertise and would like to produce a fact sheet (or sheets) for the network (or update current sheets). A small amount of funding is available to facilitate this.

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