Infectious bursal disease

Fact sheet

Introductory statement

Infectious bursal disease (IBD), or Gumboro disease, is an acute, highly contagious viral infection of chickens. It is a disease of economic significance in poultry globally. The role that wild birds may play in the spread of IBDV is not well understood. IBD continues to be a potential threat to the poultry industry globally and in Australia.

Aetiology and natural hosts

Infectious bursal disease virus (IBDV) belongs to the genus Avibirnaviurs of the family Birnaviridae. There are two recognised serotypes of IBDV. Serotype 1 is pathogenic only to young chickens, and can be divided into classical virulent, attenuated, antigenic virulent and very virulent strains. Serotype 2 viruses are naturally avirulent and do not cause clinical disease. The natural hosts of IBDV are chickens (serotype 1) and turkeys (serotype 2). Antibodies or virus are sometimes found wild birds including ducks, guinea fowl, quail, pheasants and ostrich but no signs of infection are seen. There is no evidence that IBD virus can infect other animals (OIE 2016).

World distribution and occurrence in Australia

Classical serotype 1 IBDV strains are endemic throughout the world. Very virulent IBDV is endemic in parts of southern Asia, Indonesia, South America, Middle East and Africa and spread to America in 2008 (Pitesky et al. 2012; OIE 2016).

IBD was first identified in Australia in 1974. IBDV occurs in a mild form and very virulent strains are not present in Australia (Animal Health Australia 2009, 2015).

Epidemiology

In chickens, severe acute disease, usually in 3 to 6 week-old birds, is associated with high mortality, but less acute or subclinical infections are common earlier in life. IBDV multiplies rapidly in developing B lymphocytes in the bursa of Fabricius leading to immunosuppression, increased susceptibility to other diseases, and clinical disease. IBD causes lymphoid depletion in wild birds but infection is generally sub-clinical.
The incubation period is about 2-3 days; virus shedding can last up to two weeks. The virus is highly contagious and highly resistant to heat and chemicals. It can persist in faeces, bedding, contaminated feed and water for up to four months and can spread through the movement of poultry products, equipment, feed bags, vehicles and people, and to a lesser extent, through dust aerosols. There is no evidence that IBD can be transmitted in embryos or semen (OIE 2016).

The role that wild birds may play in the transmission of IBDV remains uncertain (Animal Health Australia 2009). Outside Australia, an epidemiological link has been identified between wild birds, (including waterfowl) and domestic chickens. Evidence suggests that wild birds may transmit the virus between poultry flocks, and may also serve as a reservoir for the virus (Ogawa et al. 1998; Jeon et al. 2008; Kasanga et al. 2008). There is at least one documented case (in South Korea) of IBDV transmission from wild birds to commercial poultry (Jeon et al. 2008).

Transmission of IBD between wild birds and poultry is likely to be due to scavenging of dead chickens, ingestion of contaminated water, or exposure of respiratory or conjunctival membranes to contaminated poultry dust.

IBDV antibodies have been detected in Australian wild birds including magpie geese (Anseranus semipalmata), fleshy-footed shearwaters (Puffineus carneipes), wedge-tailed shearwater (P. pacificus), sooty terns (Sterna fuscata), common noddy (Anous stolidus), silver gulls (Larus novaehollandiae) and black ducks (Anas superciliosa) in Australia. Serotype 1 antibodies have been reported in a silver gull, serotype 2 antibodies in magpie geese and common noddies, and both serotypes in shearwaters and black ducks (Wilcox et al. 1983; Animal Health Australia 2009). There is no data that suggest IBDV is transmitted by wild birds in Australia. Antibodies to IBDV have been detected in Adelie (Pugoscelis adeliae) and emperor (Aptenodytes forsteri) penguins in the Antarctic (Gardner et al. 1997; Watts et al. 2009).

Clinical signs in chickens, acute infection causes depression, debilitation, dehydration, watery diarrhoea and swollen, blood-stained vents. Mortality rates vary with virulence of strain and dose as well as the host’s ability to mount an effective immune response. Infection with less virulent strains may not result in overt clinical signs but chickens may develop fibrotic or cystic bursa of Fabricius that can prematurely atrophy (before six months of age) and they may succumb to other infections due to immunosuppression.

IBDV infection in wild birds is believed to be subclinical with no associated signs. In artificially inoculated wild birds, there was no evidence of disease, changes in behaviour, or mortality (Van den Berg et al. 2001).

**Diagnosis and specimens**

The agar gel precipitation (AGP), virus neutralisation test (VN) and ELISA may be used as serological tests however there may be cross-reactions between serotype 1 and 2. PCR may be used to detect the virus. Samples that can be collected for diagnosis are fresh serum, caecal tonsils and kidney tissues (OIE 2016).

**Pathology**

In artificially inoculated wild birds, no macroscopic lesions were observed at necropsy in the bursa of Fabricius or in secondary lymphoid organs. There is no information on clinical pathology changes in wild birds.
Treatment, prevention and control

Treatment for wild birds is not undertaken as infection does not cause disease. The primary focus for prevention and control on IBDV is biosecurity of poultry farms, and vaccination of chicks. Poultry farmers, should be encouraged to protect their stock from exposure to wild birds to minimise potential risk of infection.

Surveillance and management

Wildlife disease surveillance in Australia is coordinated by the 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.

There are no formal surveillance programs for IBDV in wild birds in Australia. Evidence of infection or exposure of Australian wild birds to IBDV would be considered interesting and unusual and would be captured in the National Wildlife Health Information System (eWHIS). We encourage those with laboratory confirmed cases of this condition in native Australian or feral birds to submit this information to the national system for consideration for inclusion in the national database. Please contact us at admin@wildlifehealthaustralia.com.au.

Statistics

Serological studies of almost 400 native water birds of 11 species from several areas of Western Australia were undertaken for evidence of exposure to IBDV. Positive results were reported in 2/4 fleshy footed shearwaters, 1/1 silver gull and 11/38 black ducks (Wilcox et al. 1983).

Human health implications

There are no human health implications and no evidence that IBD virus can infect humans.

Conclusions

IBDV is not considered a direct risk to wild bird populations. Wild birds have a potential role in transmitting the virus to chickens. Ongoing research and surveys for seroprevalence of IBDV in wild Australian birds would contribute to understanding the epidemiological impact of wild birds carrying IBDV and its importance to poultry health.

References and other information


Acknowledgements

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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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