

Opinion Article

Newcastle disease virus (NDV) in poultry birds

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ABOUT THE STUDY

Virulent Newcastle disease (VND), formerly known as exotic Newcastle disease is a contagious viral avian disease that affects a wide range of domestic and wild bird species and is transmissible to humans. Though it can infect humans, most cases are asymptomatic; on rare occasions, it can cause a mild fever, influenza-like symptoms, and/or conjunctivitis. Because of their high susceptibility and the potential for severe consequences of an epizootic on the poultry industries, its effects are most noticeable in domestic poultry. Although there is no cure for Virulent Newcastle disease, the use of prophylactic vaccines and sanitary measures reduces the likelihood of outbreaks.

Newcastle disease virus (NDV), an avulavirus, causes the disease. Because the virus appears to preferentially infect and kill cancerous cells, strains of Newcastle disease virus have been used to treat cancer in humans (Murulitharan, et al., 2013). Newcastle disease virus strains have also been used to develop viral vector vaccine candidates against Ebola and Covid-19.

Newcastle disease virus strains are classified as velogenic (highly virulent), mesogenic (intermediate virulence), or lentogenic (low virulence) (nonvirulent). Velogenic strains cause severe nervous and respiratory symptoms, spread quickly, and cause up to 90% mortality (Kim, et al., 2008). Mesogenic strains cause coughing, have an impact on egg quality and production, and can result in up to 10% mortality. Lentogenic strains cause mild symptoms with low mortality. NDV is spread primarily through direct contact between healthy birds and infected birds' bodily discharges. Infected birds' droppings and secretions from the nose, mouth, and eyes spread the disease. Newcastle disease virus spreads quickly among confined birds, such as commercially raised chickens (Dortmans, et al., 2011).

Because high concentrations of the NDV are found in bird

bodily discharges, the disease can be easily spread mechanically. Virus-bearing material on shoes and clothing can be transferred from an infected flock to a healthy flock.

NDV can survive in a warm, humid environment for several weeks on the feathers, manure, and other materials of birds. It can live in frozen material indefinitely. However, the virus is quickly destroyed by dehydration and ultraviolet rays in sunlight. Smuggled pet birds, particularly Amazon parrots from Latin America, pose a significant risk of introducing Newcastle disease virus into the United States. Amazon parrots are disease carriers but do not exhibit symptoms, and they can shed NDV for more than 400 days (Dortmans, et al., 2010).

Clinical signs

The symptoms of Newcastle disease virus infection vary greatly depending on factors such as virus strain and host health, age, and species.

The disease has an incubation period of 4 to 6 days. Swelling of the tissues around the eyes and neck, greenish, watery diarrhoea, misshapen, rough- or thin-shelled eggs, and reduced egg production are all symptoms of an infected bird (Felsenstein, 1985).

In acute cases, death is sudden, and the remaining birds do not appear to be sick at the start of the outbreak. However, in flocks with high immunity, the symptoms are mild and progressive, and are followed by nervous symptoms, particularly twisted heads, after 7 days.

Virus isolation

Samples

Samples are obtained by swabbing the trachea and cloaca of chickens, turkeys, and other birds for routine isolation of Newcastle disease virus. Swabs made of cotton can be used. It is also possible to isolate the virus from the lungs, brain, spleen, liver, and kidneys (Kapczynski, et al., 2013).

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Handling

Before shipping, samples should be kept at 4 °C (refrigerator). Samples should be sent in a padded envelope or box. Regular mail is acceptable for sending samples, but overnight delivery is preferred (Sharma, et al., 1999).

Prevention

Any animals exhibiting Newcastle disease symptoms should be isolated immediately. Before being introduced to a flock, new birds should also be vaccinated. There is an inactivated viral vaccine available, as well as several combination vaccines. In developing countries, a thermotolerant vaccine is available to control Newcastle disease (Dimitrov, et al., 2016).

REFERENCES

1. Dimitrov KM, Ramey AM, Qiu X, Bahl J, Afonso CL (2016) Temporal, geographic, and host distribution of avian paramyxovirus 1 (Newcastle disease virus) *Infect, Genes and Evolu.* 2016;39:22–34.
2. Dortmans JC, Koch G, Rottier PJ, Peeters BP (2011) Virulence of newcastle disease virus: what is known so far? *Veterinary Research.* 42(1, article no. 112)
3. Dortmans JCFM, Rottier PJM, Koch G, Peeters BPH (2010) The viral replication complex is associated with the virulence of newcastle disease virus. *J Virol.*84:10113–10120.
4. Felsenstein J (1985) Confidence limits on phylogenies: an approach using the bootstrap. *Evolution.* 39:783–791.
5. Kapczynski DR, Afonso CL, Miller PJ (2013) Immune responses of poultry to Newcastle disease virus. *Develop & Compar Immun.* 41:447–453.
6. Kim L M, Suarez DL, Afonso CL (2008) Detection of a broad range of class I and II Newcastle disease viruses using multiplex real-time reverse transcription polymerase chain reaction assay. *J Vet Diagn Invest.*20:414–425.
7. Murulitharan K, Yusoff K, Omar AR, Molouki A (2013) Characterization of Malaysian velogenic NDV strain AF2240-I genomic sequence: A comparative study. *Virus Genes.* 46:431–440.
8. Sharma JM (1999) Introduction to poultry vaccines and immunity. *Advances in Veterinary Medicine.* 1999; 41:481–494.