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079 – Newcastle disease V

Post mortem findings

The lesions and the organ(s) affected depend on the strain of Newcastle disease virus involved. There are no pathognomonic lesions and, especially in milder forms of the disease, gross lesions may not be found.

Haemorrhagic lesions are often seen in the digestive tract in velogenic viscerotropic forms of Newcastle disease. These are typically seen in the proventriculus, caeca and the intestines. Even though clinical signs are seen, gross lesions in the central nervous system are invariably not seen. Gross pathology is not always seen in the respiratory system but when it is, it is typically a mucosal haemorrhaging and a tracheal congestion. Air sacculitis is seen, but usually only when there is a co-infection, and catarrhal and caseous exudates are more likely to be caused by secondary bacterial infections. Other lesions that can be seen include focal splenic necrosis, haemorrhages in the lower eyelid and oedema around the trachea in the thoracic inlet.

In birds in lay Newcastle disease is associated with egg yolk material within the abdominal cavity and ovarian follicles which are often flaccid and degenerating.

Diagnosis of Newcastle disease

As neither the clinical or post-mortem findings are pathognomonic, and as a legal measure are often imposed to control spread, diagnosis must be accurate. This necessitates viral isolation and identification. Even though PCR can give a positive diagnosis, it is important, especially in primary outbreaks, to obtain the causative virus for proper characterisation and possible future use.

The best samples for virus isolation are intestinal, faecal and respiratory tract swabs with samples from other organs implicated by the clinical signs seen before death. Swabs should be transported chilled or frozen. Newcastle disease is a haemagglutinating virus.

Characterisation of ND virus

Often statutory requirements necessitate viral characterisation based on pathogenicity testing and/or nucleotide sequencing.

Of the pathogenicity tests mean death time (MDT), intracerebral pathogenicity index (ICPI) and intravenous pathogenicity index (IVPI) are the ones most commonly used. Typical results are shown in the table below.

Viral type	ICPI	IVPI	MDT (hours)
Asymptomatic enteric	0.0	0.0	>150
Lentogenic	0.2	0.0	120
Mesogenic	1.4	0.0	46
Velogenic	2.0	2.7	48

Differential diagnosis

Differential diagnosis is not easy because of the wide range of clinical signs and pathologies that can be seen.

Even when a haemagglutinating virus is isolated, avian influenza, other avian paramyxoviruses and infectious bronchitis need to be considered.