

## Monograph

Thu, 01/27/2011 - 14:43 — Anonyme **definition:**

Highly contagious and infectious disease affecting birds and more often galliforms. It is caused by a type 1 avian paramyxovirus.

The clinical forms of the disease vary. In the classic form general health is affected and is accompanied by digestive, respiratory and/or nervous disorders. The more severe forms progress rapidly towards death.

As a major problem in poultry farming (high contagiousness, clinical seriousness), the disease leads to significant economic loss.

### **Situation in America:**

Enzootic disease in many parts of the world, especially in various tropical areas such as South and central America. It's present in the Caribbean.

### **Susceptible species:**

Domestic and wild birds, especially galliforms, but also pigeons ("pigeon paramyxoviruses") and psittacines. Ducks are little affected by the disease.

### **Receptivity and susceptibility factors**

Age (young animals), species, stress.

### **Etiological agent:**

An enveloped RNA virus from the family Paramyxoviridae, of the Rubulavirus genus, serogroup 1.

Pathogenicity varies depending on the strain involved (lentogenic, mesogenic or velogenic strain), the species affected and tissue tropism of the infecting strain (viscerotropic, neurotropic, pneumotropic).

Strain virulence can be determined using an ICPI index (Intracerebral Pathogenicity Index). ICPI  $\geq$  0.7: mesogenic or velogenic strain.

The virus is highly resistant in droppings and survives in carcasses, egg shell (7-8 months) and in the ground (3 months).

### Methods of transmission **Source:**

Domestic or wild birds:

- Infected
- Early carriers (2 days before symptoms appear)
- Chronic carriers (2 months after recovery)
- Healthy or vaccinated carriers

### **Virulent matter**

Droppings, eye and nose discharge, all tissues, blood, eggs.

### **Transmission:**

**Vertical**

In the hatchery when the eggs break or through soiled shells.

**Horizontal**

- Direct: contact, aerosols.
- Indirect: premises, feed, water, equipment, litter, clothing, airborne transmission possible.

**Method of contamination:**

Respiratory or digestive.

**Symptoms:**

Newcastle disease is clinically indistinguishable from Avian Influenza.

**Incubation period:** 5-7 days on average, [3 days; 21 days].

The symptoms vary depending on strain virulence, tropism, the host species and the infected animal itself (residual immunity).

**Subacute form**

Septicaemia and death in 1 or 2 days.

**Classic acute form**

3 phases:

Invasive phase:

- General health is affected: loss of appetite, ruffled feathers, falls and laying abnormalities.
- Followed by: cyanosis, petechia and underlying oedema of the comb, neck and wattles.

Stable phase: signs are seen in a single animal or several animals.

- digestive disorders: abundant greenish diarrhoea.
- respiratory disorders: discharge, dyspnea and coughing.
- nervous disorders: encephalitis (convulsion, loss of balance, paralysis, etc.)

Terminal phase:

- either aggravation and death
- either clinical improvement with persistence of nervous sequelae and maying abnormalities.

**Subacute or chronic form**

Respiratory disorders. General health is not affected. Sometimes a drop in egg production occurs as do abnormal behaviour and diarrhoea. Mortality may be high.

**Asymptomatic form**

Very frequent and caused by lentogenic strains which are detected by virological analysis.

**Lesions Macroscopic lesions:**

No pathognomonic macroscopic lesions. The lesions are simply evocative of haemorrhagic septicaemia.

- Generalised and especially digestive lesions (proventriculus, intestines).
- Ulcers and necrosis of digestive tube lymphoid tissue and of caecal and duodenal tonsils.
- Congestive and edematous lesions.

Marked lesions in chickens but less in turkeys. Lesions are often absent in ducks (asymptomatic forms).

**Microscopic lesions:**

Viral encephalitis microscopic lesions and necrosis of the respiratory epithelium.

**Diagnostics Clinical diagnosis:**

This is difficult due to lesion heterogeneity. Diagnosis made on the basis of suspicion only and taking into account clinical presentation and contagiousness. Only virus isolation and identification would enable a firm diagnosis to be made

**Differential diagnosis:**

Newcastle should not be mistaken for:

- Avian Influenza
- Acute Fowl Cholera
- Fowl pox (diphtheritic form)
- Infectious Bursal Disease (Gumboro)
- Chlamydiosis (in Psittacines)
- Infectious laryngotracheitis
- Infectious bronchitis
- Mycoplasmosis

**Laboratory diagnosis:**

This is essential as clinical diagnosis alone is uncertain in a disease with significant sanitary implications (high contagiousness, high death rate, risk of confusion with avian influenza).

**Samples**

Cloacal and tracheal swabs, fresh droppings and organ samples (head, lungs, intestines, liver, spleen) taken from infected animals or carcasses (at least 5 animals).

**Virological diagnosis:**

- Virus isolation on embryonated eggs
- Virus identification by haemagglutinating activity (HA) detection and haemagglutination inhibition (IHA).
- Determination of pathogenicity by:
  - a plaque test on chicken embryo fibroblast cultures.
  - mean death time of embryonated hen eggs.
  - intracerebral pathogenicity index in 1 day old chicks (ICPI).
  - intravenous pathogenicity index in 6 week old chickens.

**Serological diagnosis:**

Haemagglutination inhibition test (HI) or ELISA test.

Antibodies are detectable as of the 7th day of infection.

Take into account vaccinal antibodies.

**Treatment:**

No specific treatment exists.

**Prophylaxis:****Sanitary prophylaxis**

Insufficient during an epizootic or in an enzootic area.

- Defensive measures:

Inspection on importation, general hygiene, disease-free guarantee in egg and chick purchase.

- Offensive measures:

Culling of all infected batches and destruction of carcasses and eggs followed by disinfection and depopulation of 21 days.

Often unenforceable (as costly) or insufficient (rapid dissemination of the disease).

**Medical prophylaxis**

Necessary in infected or high-risk areas. The vaccination considerably reduces the loss in poultry flocks. Different protocols exist according to species, age and the epidemiological context.

Animal sanitary status must be taken into account: risk of aggravation of the reaction to the vaccine by *Mycoplasma* (use an inactivated virus vaccine in this case).

Control the level of protection offered by the vaccine by regular serological screening (haemagglutination inhibition test).

**Vaccines:**

Inactivated or modified virus vaccines (Hitchner B1, Clone 30, La Sota, VG/GA) are available.

Live B1 and La Sota strains can be administered in drinking water or as a spray (mass vaccination).

Chicks may be vaccinated as early as 1-4 days' old but the vaccine is most effective when administered from 2-3 weeks of age.

**Links:** [The poultry website](#) [1]

[OIE : terrestrial manual](#) [2]

- [Newcastle diseases](#) [3]

**Source URL:** <http://www-old.caribvet.net/en/diseases/newcastle-diseases/monograph>

**Links:**

[1] <http://www.thepoultrysite.com/diseaseinfo/111/newcastle-disease-paramyxovirus-1>

[2] [http://www.oie.int/fileadmin/Home/eng/Health\\_standards/tahm/2.03.14\\_NEWCASTLE\\_DIS.pdf](http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.14_NEWCASTLE_DIS.pdf)

[3] <http://www-old.caribvet.net/en/diseases/newcastle-diseases>