



Tikrit University  
College of Veterinary Medicine

# Viral Diseases

## Newcastle Disease (N.D)

Subject name: Poultry Diseases

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# Viral Diseases

## 1-Newcastle Disease (N.D)

\***Definition:** it is acute or subacute contagious disease of domestic and wild birds, characterized by respiratory symptoms and often with neurologic signs.

\***Etiology:**

\*The disease is caused by Paramyxovirus 1, single strand RNA, six genes forming the genome of NDV code for seven proteins.

\*It can be propagated in allantoic cavity of the embryonic egg (9-11 day).

\*The virus has the ability to agglutinate large number of erythrocytes of bird and mammalian.

\***Synonyms:**

Avian pest, avian distemper, Ranikhet disease, Tetlo disease, Korean fowl plaque, avian pneumoencephalitis, pseudo-fowl pest.

\***According to virulence**, the virus can be categorized to:-

1-Velogenic strain (Texas, Italian, Milano strain).

2-Mesogenic strain (Roakin, Beaudette c).

3-Lentogenic strain (Hitchner B1, La Sota).

\***According to affinity or tropism**, the virus can be categorized to:-

1-Vesotropic.

2-Pneumotropic.

3-Neurotropic.

**\*Susceptibility:**

**1-Chicken, Turkey, Pheasant are very sensitive to infection.**

**2-Ducks, geese, Pigeon are sensitive.**

**3-Man can get infection causing conjunctivitis, headache, and fever.**

**\*Mode of infection (transmission):**

# The main route of infection are **respiratory** and **orally** by direct or indirect way.

**#Mode of spread of NDV or virus source in epizootics:-**

**1-Movement of birds** e.g pet bird, wild bird, game bird, racing pigeon, commercial poultry. (Infected bird shed virus for several day after infection).

**2-Contact** with other animals.

**3-Movement of people** (worker,vistor,veterinarian) and equipment, Vehicle,tools.

**4-Movement of poultry product** (egg, bioproduct).

**5-Airborne spread.**

**6-Contaminated poultry feed, water.**

**7-Vaccines.**

**\*Incubation Period:**Vary from (2-15).

**\*Clinical Signs: depend on many factors:-**

**1-Virulence of the strain:** the more virulence strain, the more pathogenic and high mortality.

**2-Age of bird:** all age birds are susceptible but young birds are more susceptible than old one.

**3-Immunity status of the bird:** the more immune bird is the more resistance than non-immune one.

**4-Healthy condition of the bird:** healthy birds are more resistance to disease than non-health one.

**5-Number of exposure:** the more exposure birds are more resistant to disease.

**6-Temperature of the environment:** in winter the susceptibility to infection is higher than in summer.

**\*The disease has 3 categories:**

**1-Acute:** the mortality rate **90%** and duration of the disease (**3-8**) days.

**2-Subacute:** the mortality **50%** and duration of disease (**8-20**) days.

**3-Mild:** the mortality (**5-10%**) and duration of disease (**20-30**) days.

**\*The main clinical signs:**

1-With **extremely virulent viruses**, the disease may appear **sudden death**, with **high mortality**, in absence of clinical signs.

2-**Respiratory form**, this type characterized by gasping, coughing, nasal discharge, lacrimation, this form frequently followed (1-2) day by neurologic signs.

3- **Neurological form**, this type characterized by **paralysis** of legs and wings, torticollis, convulsion, tremor, **twisting of the neck**, moving in circle.

4- In addition to the above forms, **green diarrhea** (seen in birds that donot die early in infection), weakness, anorexia.

5-**In semimature and mature birds:** there is **drop in egg production**, shell-less, pigmented eggs, thin shell.

**\*Gross lesion of ND:**

1-In **acute or subacute**, there is **Petechial hemorrhage** (which is result from necrosis) in **viscera**, air sac, serous membrane particularly in the **gland of proventriculus**.

2-**In subacute**, there is **hemorrhagic ulcer** on the **mucoous membrane** in intestine, and lymphoid tissue such as **cecal tonsils** and **peyer's patches**.

3-There is necrosis of visceral organ such as spleen which is **mottled**.

4-**catarrhal inflammation** of the digestive and respiratory tract.

**\*Diagnosis of ND:**

1-**Clinical signs**.

2-**P.M lesion** (gross lesion).

3-Isolation and identification of virus.

4-Serological test such as(**Haemagglutination inhibition test**, neutralization test, fluorescent technique, **ELISA**, PCR).

**\*Control and prevention:**

- 1- Strick sanitation and good management.
- 2-Burn and buried the carcass.
- 3-**Emergency vaccination** by spraying vaccine ( attenuated live vaccine).
- 4- For control the disease, we can vaccinate the birds using **different programs** according to epidemiology of the area or presence or absence of the diseases.

**\*In Iraq** we use different programs for prevention from disease depending on the epidemiology of distinct area, these programs vary in the number of vaccination and route of vaccination.

**\*Types of Vaccination of ND:**

**1-Live attenuated vaccine:**

- In **Broiler**, we can use **3-4** times vaccination.
- Layer and Breeders, we can use **7-8** times.
- The route of administration may be by **drinking water, eye drop and spraying.**

**2-Killed vaccine(Oilnemmulsion vaccine):**

We can use it at the age of **16-18** week.

- The route of administration is by two routes either Intramuscular (**I.M**) or Subcutaneous (S.C) route.

Referens:

- 1-Saif, Y. M. (2009). *Diseases of poultry*. Twelfth edition. Iowa. Blackwell.2009. 75-117.