Respiratory problems in poultry diagnosis, differential diagnosis treatment, and prevention.

Committee

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Abbreviations:

(AIV ,AI flu, influenza, fowl plague) Avian influenza
ND Newcastle disease virus
ILT Infectious laryngotracheitis
Wet pox Fowl pox
IB Infectious bronchitis
SHS Pneumonitis infection (Turkey Rhinotracheitis/Swollen Head Syndrome)
MD Marek's Disease virus
I.coryza, Infectious Coryza
CRD Mycoplasma,
F cholera Pasteurella multocida
Chlamydiosis, Ornithobacterium rhinotracheale.

Scope: The guidelines concerned diagnosis, treatment, and prevention of respiratory disease in poultry. The guidelines also provided landmarks for the

evaluation of the severity and the most suitable antibiotics for therapeutic intervention.

The target audience: The guideline is intended for all veterinarians who are intended to diagnose, treat, and control **Poultry Diseases**.

Aim: Poultry production is critical to the economy and food security of many developing countries because not only is poultry easy to farm and well suited to backyard production, but in many cases, it is a staple food.

- This Guideline of poultry diseases is a key reference work that poultry production systems across the globe, describing the range of diseases affecting all domesticated bird species, and contains a differential diagnosis to aid in detecting and recognizing specific diseases, diagnosis, differential diagnosis, prevention, and control and treatment.

DIFFERENT ETIOLOGICAL FACTORS OF RESPIRATORY SIGNS AND DISEASES

Clinical signs:

Respiratory signs in poultry include runny watery eyes, swollen sinuses, nasal discharge, wheezing, sneezing, gurgling/rattling, gasping and mortality. Cyanosis, considering the spare capacity of the avian respiratory system is indeed a sign of a significantly acute or long-standing significant respiratory malfunction.

The differential diagnosis of respiratory diseases in poultry includes the following diseases Bacterial - Coryza, Mycoplasma gallisepticum (MG), Pasteurella multocida (Fowl cholera), E. coli, Strep, Chlamydiosis, Ornithobacterium rhinotracheale.

- **Viral** -ILT, IBV, AIV, NDV, F pox, Pneumovirus, Mareks disease, Leucosis
- **Fungal** -Aspergillosis
- **Parasitic** - Syngamus, trichomoniasis.
- **Nutritional** - Vit A

1. **Avian influenza (AIV) Synonyms: AI, flu, influenza, fowl plague**
   Etiology: Orthomyxovirus

Respiratory signs in LPAI incidents are low and may be associated with concurrent bacterial or other viral infections.

2. **Newcastle Disease**

Etiology: Avian Paramyxovirus -1 and Newcastle disease

Avian Paramyxoviruses- 2 and 3.

Neurotropic velogenic - high mortality; respiratory and nervous signs predominate;
Mesogenic - **low mortality**; respiratory signs usually predominate.

Respiratory signs including sinusitis and runny eyes were evident in a layer of flocks without nervous signs or before the emergence of nervous signs. Depression, nervous signs; ataxia, paralysis, opisthotonos and head nodding, increased mortality, and changes to eggshell color.

Gross pathology showed tracheal hemorrhage, airs sacculitis and congestion similar to some cases of ILT

Control:

I. Timely vaccination with live and/or inactivated (killed) vaccine is the only reliable control method.

2. Vaccination alone is not sufficient to control ND. It must therefore be accompanied by good hygiene, good management, and good biosecurity practices.

3. ILT Infectious laryngotracheitis

Etiology: herpes virus

ILT may appear in 2 forms; the severe form with dyspnea, gasping, coughing, blood-stained mucus, cheesy core, and mortality, and the milder form where clinical signs include watery eyes, swelling of the sinuses, nasal discharge, possibly hemorrhagic, conjunctivitis, and mortality. In mild forms, conjunctivitis may be the only gross pathology present. In either the severe or the milder forms, ILT requires consideration of viral and bacterial differential. The presence of cheesy cores in the tracheal lumen is almost pathognomonic of ILT.

4. Fowl pox

The disease occurs in the cutaneous (classical) form and the diphtheritic (wet pox) form and the combination of both in the same flock or even in the same bird. The wet pox form is more associated with respiratory signs than the classical cutaneous form. In the wet pox form, yellowish lesions appear on the mucous membranes of the mouth, oesophagus, or the trachea and respiratory signs can be evident and may either resemble ILT or Coryza/CRD.

Flock mortality ranges from low to 50% depending on the species of birds, their age, the virulence of the virus and the nature of the lesions.

Control:

I. Fowl pox can be prevented by vaccination. Therefore, preventive vaccination using a live vaccine is the most successful control method. Even when an outbreak of fowl pox has been diagnosed, it is advisable to vaccinate the flock immediately to stop spread of infection.

2. Precautions should be taken to minimize the spread of the vaccine virus, both on the birds and in the environment. Being a live virus, it is capable of spreading the disease.
3. Carcasses or affected birds should be buried or burnt, and house should be disinfected.

5. Pneumonitis infection (Turkey Rhinotracheitis/Swollen Head Syndrome)
Species: turkeys and chickens.
Clinical signs and lesions: **In young turkeys -** sneezing. Rales and nasal discharge, conjunctivitis, and swelling of the infraorbital and submandibular areas can be seen. In laying turkey flocks a drop in production may occur along with respiratory distress. Morbidity is high whereas mortality may vary being usually higher in young poults. **In chickens:** Pneumovirus may be involved in the so called "swollen head syndrome" (SHS)- affected chickens may show swelling of the periorbital and infraorbital sinuses, torticollis, cerebral disorientation and depression. Marked egg production losses can be associated with SHS.
In cases of SHS, apart from oedema of the head, also purulent or caseous subcutaneous exudate can be found. Rhinitis, tracheitis and sinusitis are frequently noted in both chicken and turkeys, E. coli infection is often involved.

6. Infectious bronchitis (IB)
Etiology: Corona-virus is the causal agent. Several different serotypes of IB virus are known to exist.
Species affected: Chickens are the main species susceptible to IB virus although reported occasionally in pheasants where it causes high mortality.
Clinical signs: In young chicks less than 6-8 weeks of age IB virus infection causes cheesy exudates in the bifurcation of the bronchi, thereby causing asphyxia, and severe respiratory distress, similar to ILT. Runny eyes and swollen sinuses may also be present.
In older chickens, IB does not cause mortality. Respiratory signs may be present but are usually relatively mild or absent. Egg production is affected and deformed eggs with pale shell eggs, soft-shelled, misshapen eggs and wrinkled shells will often be laid. The internal quality of the egg, especially the albumen more watery than normal may be observed.
Control: Both live and killed vaccines are available of value.

7. Marek's disease and leucosis
Etiology: Herpesvirus

Although not the primary manifestation of Marek's disease, tumor formation localized in some areas or organs, or those affecting some of the nerves may lead to the presence of respiratory signs.

General guidelines for the treatment of viral respiratory diseases.

There is no specific treatment for viral infections.

- Antibiotics for 3–5 days may aid in combating secondary bacterial infections.
- Raise the room temperature 5°C for brooding-age chickens until symptoms subside. Baby chicks can be encouraged to eat by using a warm, moist mash.
- No treatment due to viral disease, but to avoid secondary infection,
- supportive therapy in drinking water.
- Electrovit C plus or soluvit E plus Syp Brofin (ibuprofin) 120mg/400 L D W Tylodox (tylosin + doxycycline) 1-2 g/4L D W
- **Prevention**: biosecurity program and vaccination program when available.

BACTERIAL DISEASES

These include: Coryza (Haemophilus paragalinarum) I.coryza, Mycoplasma/CRD, Pasteurella multocida- F cholera, *E. coli*, Streptococcosis, Chlamydiosis, *Ornithobacterium rhinotracheale*.

-some species were more susceptible than others (e.g. F cholera - turkeys).

-Some aspects like the age of the bird are useful in differential diagnosis (F cholera rarely in birds younger than 16 weeks of age).

It is almost impossible to arrive at a presumptive diagnosis of any of the above bacterial diseases on the basis of respiratory signs. mortality, % morbidity, presence of other clinical signs and clinical history are important for diagnosis.

Gross pathology like perihepatitis and pericarditis usually associated with E.coli are also encountered in Pastuerellosis, Streptococcosis, Chlamydiosis, CRD and *Ornithobacterium rhinotracheale*. Gross pathology may not be present in acute cases especially when the organism excretes endotoxins or its presence may actually be a result of secondary infection.

Clinical signs: respiratory signs ranging from runny eyes and nostrils to wheezing, sneezing, gasping, and mortality may be encountered. However, for example, the presence of significant mortality among chickens would suggest that Infectious Coryza, CRD, and possibly Chlamydiosis or *Ornithobacterium rhinotrachelis* are not serious contenders on the differential diagnosis list.

While a unilateral swelling of the face in chickens may indeed indicate presence of *Haemophilus paragallinarum*, the absence of such a swelling but presence of runny nostrils does not indicate that it is CRD or other bacterial infection in preference to Coryza.

Guideline for bacterial isolation and tissues transportation:

Doing a post-mortem in the middle of summer and leaving the designated lab tissues unchilled for longer than 10 minutes may be required to ensure that a positive case of infectious coryza is not diagnosed as Haemophilus *paragallinarum* can be inactivated rapidly outside the live bird, and at a temperature of 37^0C the opportunity for survival is only 24 hours.

Mycoplasma requires very specific transport and storage conditions including temperature and time. Tissues must be transported on dry ice until ready to be cultured on media inoculated with penicillin.

Both colibacillosis and Streptococcosis are considered secondary pathogens and likely to be associated with damage to the respiratory tract by other organisms and /or stress factors. However, it is important to consider that especially Colisepticemia as a result of inhaled *E. coli* contaminated dust can easily occur and furthermore, lesions of Colisepticemia have been produced readily and quickly following inoculation of pathogenic *E. coli* into the air sacs of healthy chickens. **Chlamydiosis** is often excluded in cases involving respiratory signs of poultry. The disease is believed to be rare in chickens world-wide but **more common in ducks and turkeys.** Mortality varied between flocks ranging from no increase in mortality to 7% - 10% mortality in commercial young pullets. Morbidity also varied and in some cases up to 20% morbidity was reported. Clinical signs vary between cases and included; conjunctivitis (dry and wet), birds continuously scratching their eyes, blindness, periorbital swelling, nasal discharge, cough and gasping. On P.M. the following lesions were observed; Interstitial pneumonia, tracheitis, airsaculitis, pericarditis, perihepatitis and splenomegaly.

Bacterial disease	**Treatment of bacterial respiratory diseases**
Pasteurella multocida	Most isolates from poultry are susceptible to the tetracyclines. Injectable oxytetracycline has been successful in controlling experimentally induced fowl cholera in turkeys. The most commonly used treatments for fowl cholera in commercial turkeys include chlortetracycline administered in feed or water and sulfadimethoxine in the water.
I. Coryza	Water soluble antibiotics or antibacterials can be used. Sulfadimethoxine is the preferred treatment. If it is not available, or not effective, sulfamethazine erythromycin (or tetracycline can be used as alternative treatments.

	Sulfa drugs are not approved for pullets older than 14 weeks of age or commercial layer hens. While antibiotics can be effective in reducing clinical disease, they do not eliminate carrier birds
CHLAMYDIOSIS (Ornithosis, Psittacosis, Parrot fever)	Chlorotetracycline can be given in the feed (200–400 g/ton) for 3 weeks. Other antibiotics are usually ineffective. Recovered birds are safe for processing.
MYCOPLASMA (CRD)	Erythromycin, tylosin, spectinomycin, and lincomycin all exhibit anti-mycoplasma activity and have given good results. Administration of most of these antibiotics can be by feed, water or injection. In commercial poultry, feed medication with either of the tetracyclines at 200 g/ton for several days is a common practice. Water-soluble tetracyclines are also available. Subcutaneous injection of tylosin at 3 to 5 mg/lb body weight or administration in the drinking water at 2 g/gallon for 3 to 5 days is also recommended. Antibiotic treatment, although palliative, does not eliminate infection with the avian mycoplasmas.These are effective in reducing clinical disease. However, **birds remain carriers for life** **Prevention**: Eradication is the best control of mycoplasma disease.
E.coli	Antibiotic sensitivity test
Aspergillosis	There is no cure for infected birds. The spread can be controlled by improving ventilation, eliminating the source of the infection, and adding a fungistat (mycostatin, mold curb, sodium or calcium propionate, or gentian violet) to the feed and/or copper sulfate or acidified copper in the drinking water for 3 days. The litter can be sprayed lightly with an oil-base germicide to control dust and air movement of fungal spores,thoroughly clean and disinfect the
PARASITIC Syngamiasis	thiabendazole at 454 g/ton in the feed for 14 days. Levamisole administered in the drinking water at 1 g/gallon of drinking. This treatment should be repeated in 7 to 14 days
Trichomoniasis	Flagel
Vitamin A deficiency	Fat soluble. Vit in drinking water

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