Avian tuberculosis

(avian T.B.) Avian mycobacteriosis, TB.

Definition

 It is a slow spreading, usually chronic, granulomatous infection of semi-mature or mature birds, characterized by progressive weight loss and ultimately by emaciation and death.

Etiology

• Mycobacterium avium

- Acid fast, rod-shaped, It is resistant to temperature changes, drying, pH changes, to many disinfectants and survives in the soil for years It is readily destroyed by direct sunlight.
- Grows best on media containing glycerin, egg medium (Dorset egg medium), the colonies being oily, moist, rounded, glistening, and yellow to brownish yellow.



Mycobacterium tuberculosis visualization using the Ziehl–Neelsen stain.

Susceptibility

- All species of birds are susceptible.
- Pheasants seem to be highly susceptible, whereas the disease is uncommon in turkeys.
- Tuberculosis is more prevalent in captive than in free-living wild birds. It is unlikely to be seen in commercial poultry because of the short life span and husbandry practices used.
- Mammal, are susceptible. Other animals such as sheep, rabbit, rodents and calves are also susceptible.

Mode of transmission

- Ingestion of contaminated feed and water.
- Inhalation of infected droplet.
- Cannibalism (evisceration of infected birds).
- Contact with hogs and sheep that harbor the bacilli.
- Wild birds may act as carriers.

Incubation period

• This disease is characterized by a generally long incubation period several months, so the disease does not appear in young birds although they are not resistant.

Clinical signs

- Age: fowls may become infected at any age, but because of the chronic nature of the disease symptoms are not usually observed in birds less than one year of age.
- One of the first indications of tuberculosis in fowl is loss of weight ("going light ") although the appetite is good.

- Atrophy of the breast muscles and prominent or even "knife edged" keel bone
- Temperature: Within normal range.
- Combs, wattles, skin and mucous membranes of the head become pale (Pallor), and the feathers are ruffled, listless and unthrifty.
- Persistent Diarrhea with soiling of the tail feathers is common.
- Lameness in one or both legs due to tuberculosis abscess in the joints.

Gross lesions

- Affected bird is very light in weight and emaciated.
- Gray to yellow nodules (tubercles) of varying size involves the liver, spleen, intestine, mesentery, bone marrow and rarely lungs.
- Lesions are not mineralized.
- Liver and spleen are enlarged.



















After necrotization of some tubercles, pseudodiverticula that are constantly shedding viable mycobacteria are formed.





Diagnosis

- *Case history* of chronic disease and persistent mortality in an old flock is suggestive of tuberculosis.
- Demonstration of typical gross lesions and demonstration of acid fast bacillus in impression smears or sections of tubercles.

• **Differential diagnosis:**

- Should differentiate this disease from:
 - Blackhead disease ulcer like lesion in liver and cecum.
 - Marek's disease young age and histopathology.

• <u>A. Tuberculin test</u>

□Site:

• Wattle for chicken (lateral aspect), wing web for turkey, sub-mandibular or around the vent for pigeon.

Preparation *and procedures:*

- Wash wattle with 70% alcohol.
- Syringe, needle tuberculin syringe, and of 25 gauge.
- The other wattle remains uninjected wattle as the control.
- When testing the flock it is usual to inject the wattle on the same side for each bird.

Amount: 0.2ml of purified protein derivative (PPD) tuberculin of *M avium*.

- Check reaction at 24 and 48 hr after inoculation.
- The test is read by palpating the two wattles simultaneously between the first finger and thumb of each hand.

Interpretation

- Positive reactor is recognized by a hot, soft, edematous, and swelling of the injected wattle.
- If reactors were found, retest in 30- 45 days.
- Tuberculin test is of value only in chickens.

B. Rapid agglutination test

- One drop of the antigen is mixed with a drop of the blood of suspected bird on a glass slide
- The agglutination test is a rapid whole blood test in which a drop of antigen (concentrated suspension of M avium) is mixed with a drop of the blood of suspected bird on a glass slide.
- Positive reaction is indicated by agglutination within 1 minute.

Prevention and Control

- Once the disease is confirmed at poultry farm, it is better to depopulate the entire flock and sell the healthy ones for food.
- Reactors may be destroyed and tuberculin testing may be repeated at 3 and 12 month interval to remove fresh reactors.
- The infected premises may be left unused if possible for one and preferably two years.
- Avian tuberculosis in zoos is difficult to eradicate. New additions to the aviary should be quarantined for ≥6 mo.
- Raise fowls away from hogs and sheep.

- Treatment: Medication Not advised Not effective, as the disease is contagious for men and most M avium complex organisms are resistant to antituberculosis drugs
- <u>Vaccination</u> Not effective