

Coccidiosis in domestic fowl

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Coccidiosis in domestic fowl causes substantial losses to the poultry industry. Different species found in domestic chicken are-

- Eimeria acervulina*=Common, slightly to moderately pathogenic
- E. brunetti*= Uncommon, markedly pathogenic
- E. hagani*=rare, slightly pathogenic
- E. maxima*= Common, slightly to moderately pathogenic
- E. mitis*= Common, non-pathogenic
- E. mivati*= Common, slightly to moderately pathogenic
- E. necatrix*=most pathogenic
- E. praecox*= Common, non-pathogenic
- E. tenella*= most pathogenic
- Cryptosporidium tyzzeri*
- Wenyonella gallinae*

***E. tenella*:**

Most common and highly pathogenic found in domestic fowl throughout the world. It causes heavy economic losses to poultry industry. It causes caecal coccidiosis as its all developmental stages occurs in caecum.

Life-cycle:

Excystation of sporulated oocyst occur in presence of carbondioxide, trypsin and bile in the small intestine. The liberated sporozoites invade the surface epithelium of caecum. They were engulfed by macrophages in lamina propria and transported in these to the glands of Lieberkuhn. Here they leave the macrophage and enter in to the epithelial cell. In epithelial cell, sporozoite rounds up and become a trophozoite. Mature 1st generation schizonts are found at the bottom of the crypts of the caecal gland. First generation schizonts are rupture into the lumen of the gland about 60-72 hours after infection, the merozoites penetrates other epithelial cells, round up and form young generation of 2nd generation schizonts. Colonies of 2nd generation schizonts are first appear by 72 hours, and by 96 hours, they become mature schizonts. Disruption of 2nd generation schizonts and the overlying epithelium releases the merozoites into the lumen of the caecum. 2nd generation schizont causes massive haemorrhage into the caecal lumen which may evident 96 hrs of infection. 2nd generation schizonts enter new epithelial cell which may lead to 3rd generation schizonts or the gametogonous cycle.. The gametogonous stage appears initially as rounded trophozoite and then after repeated nuclear division causes formation of microgamont and macrogamonts. The prepatent period is 7 days.

Pathogenesis:

Caecal coccidiosis most frequently occur in young birds, mostly those aged 4 weeks time. Older birds are usually immune due to previous infection. Clinical coccidiosis produce only when heavy infections are acquired over relatively short period of time, not exceeding 72 hrs. On a flock, coccidiosis first noticeable at about 72 hrs after infection with a clinical signs-

1. Chickens droop
2. Cease feeding
3. Huddle to keep warm
4. By 96hrs, blood appears in the droppings
5. Greatest haemorrhage occurs on 5th or 6th day of infection
6. By 8th or 9th day bird either may die or way to recovery.
7. Mortality is highest between the 4th and 6th days
8. Death may occur due to excessive blood loss
9. If bird is recovered from acute illness, a chronic illness may develop as a result of persistent caecal core, which usually expelled about 14 days after infection.
10. Pathological changes mainly due to 2nd generation schizont
11. Which causes petechial haemorrhage during first 3 days, marked haemorrhage on 4th day?
12. By 5th or 6th day caeca are dilated, the content containing unclotted and partly clotted blood, schizont and merozoites
13. 7th day onwards gametogonous stages are found in the mucosa.
14. By this time, the caecal contents have become more consolidated and caseous and adherent to the mucous membrane and by 8th day the consolidated caseous plug completely fills the lumen of the caecum.
15. The caecal core detaches from the mucous membrane by 8 to 10 days and may be shed in the faeces.
16. At this time, caecal wall is thickened but lost its intense haemorrhagic appearance and following shedding the core, regeneration of the mucosa occurs and the wall contracts, and the degree of fibrosis may remain for sometimes.
17. Older birds remain as carrier.

E.necatrix:

Extremely common. Asexual development occurs in the small intestine. Gametogony occurs in caecum. Most important pathogen of small intestine of poultry.

Pathogenesis:

Next to *E.tenella*, *E. necatrix* is considered as most common pathogenic species in poultry. It causes more chronic disease than the former and affects older birds. However, disease can be produced in young chicken. The principal lesions found in the middle third of the small intestine. In acute cases, severe submucosal haemorrhage occurs on 5th and 6th days. The wall of the small intestine markedly swollen, haemorrhagic and the contents filled with unclotted blood. There may be excessive haemorrhage extend up to caeca which is confused with *E.tenella*.

E.acervulina, *E.mivati*, *E.maxima* also causes intestinal coccidiosis.

E.brunetti:

It causes rectal coccidiosis, which is a severe disease in chicken between 4 and 9 weeks of age. The lesions are confined to posterior part of the small intestine, the rectum, the caeca and the cloaca. In severe infection, the gut wall is thickened, there is haemorrhagic catarrhal exudates appears 4-5 days after infection. The affected birds pass white fluidy droppings

mixed with blood and mucous casts. There is loss of bodyweight due to severe dehydration and complete inappetance or reduced food intake.

The coccidian lesions in bird are characteristic of different species. Generally birds in a flock suffer from mixed infections. The lesions can be differentiated easily by examining different parts of intestine.

Diagnosis:

1. History of the flock.
2. Various type of lesion along with their location in post mortem examination.
3. Faecal examination

Treatment and control:

Anticoccidial drugs must improve weight and feed conversion and to suppress the development of lesions in birds.

1. Sulphonamides: The common drug in this group are sulphaquinoxaline, sulphadimethoxine, sulphaguanidine, sulphadimidine. Sulphonamides have fairly broad spectrum activity against eimeria spp.
2. Sulphaquinoxaline for therapeutic use, is given with feed @0.5% . A dose rate of 0.025-0.033% may be given fairly long period.
3. Sulphadimidine @0.4% in drinking water. This drug interfere vitaK synthesis in intestine.
4. Nitrofurans
5. Nitrofurazone
6. Furazolidone: @0.011%.in feed
7. Nicarbazin: it was the 1st drug with broad spectrum activity
8. Amprolium: most effective drug against *E.tenella*, *E.necatrix*, *E.acervulina*, lesser extent *E. maxima*. One of the safest anticoccidial drug. It can be fed at several time the recommended dose with no ill effects.@0.012%
9. Hydroxychloroquine
10. Monensin :It is protective against mortality in all species, given 0.01-0.121% in feed. The bird show good weight gain and feed conversion rate
11. Lasalocid: High degree of anticoccidial activity.
12. [Salinomycin@0.01%](#) in feed.

Control of coccidiosis can be done by using anticoccidial drugs. Sanitation and management practice. Prophylactic medicine has the major control measure , cleaning and disinfection of cages. Use of anticoccidial drug on day old chicks. Litter should be inspected for wet spots, wet litter should be cleaned and replaced by dry litter and Immunization.

Vaccination: A commercial vaccine, Coccivac. A suspension of live oocysts consisting a mixture of 8 spp. of Eimeria is given in the feed or drinking water to chicks at 4 and 14 days of age.