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Incidences and Management of Ulcerative enteritis in two Japanese quail Farms of Ramanathapuram district, Tamil Nadu, India

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Abstract

A quail farm at Dharkavalasai had two times of disease occurrence during October 2018 and November 2018 with 38% and 61.3% mortality respectively. A farm maintained at Kalugoorani had experienced the same disease condition during December 2018 with 80% mortality. All the affected flocks of Japanese quails were maintained under deep litter system. The birds at the age group of 9 to 12 weeks suffered much and the birds at laying stage showed higher mortality. The symptoms noticed were droopiness, ruffled feathers, weakness, inappetence, soiled vent with greenish white watery diarrhoea in both the farms. On necropsy the bodily condition was thin, body cavity contained little amount of serosanguineous clear fluid. Intestine was ballooned with congestion of serosal vessels. Intestinal mucosa was found to be eroded and the lumen contained mucosanguineous material mixed with desquamated materials. The intestinal wall was very thin. In some cases the liver and spleen were congested and enlarged. Cultural examination of intestinal contents showed black coloured colonies suggestive of *Clostridium colinum* infection. Direct microscopic examination of the intestinal content showed no oocysts /schizonts of coccidial organism. Therapeutic management of the condition in the farm at Dharkavalasai, with 2.5g of Tetracyclin powder (Tetracyclin Hydrochloride, Intervet®) in 1litre of drinking water for 5 days did not yield encouraging response. Megadox-N (Doxycycline with Neomycin water soluble powder) @ 1 gm in 5 litres of water for 5 days showed a slight improvement in controlling the mortality. However the problems were found to relapse. The treatment with LINCO-N (Lincomycin Hcl with Neomycin Powder) in feed @ 250 gm/ metric ton of feed for a continuous period of 1 week could completely stop the mortality. Hence, the second incidence at Kalugoorani was also treated with LINCO-N in the same dose rate and succeeded. In the adoptive period it was advised to treat the flocks with Ethnoveterinary medicinal preparations and insisted to follow strict bio-safety measures.

Keywords: Japanese Quail, Ulcerative enteritis, Deep litter system

Introduction

Ulcerative enteritis or "Quail Disease", a devastating bacterial disease caused by the gram-positive, obligate, anaerobic bacteria *Clostridium colinum*, the normal inhabitant of the intestines of healthy chickens [13]. The disease condition had been recorded primarily in captive quail birds [1, 10, 12, 18, 20] and also reported in other avian species like ruffed grouse [16], pigeons [11], robins [22], chickens [15, 17] and pheasants [6]. The disease flares up most often either after a change in the intestinal microflora or from a condition that resulted in damage to the intestinal mucosa [2, 7]. Anything that promotes excessive bacterial growth and toxin production or slow down the feed passage rate in the small intestine could promote the occurrence of ulcerative enteritis [4].

This disease was characterised by a sudden increase in flock mortality, often without premonitory signs, although wet litter was sometimes an early indicator of disease. It caused large necrotic foci in the small intestinal mucosa, and in severe cases, the whole mucosal surface of the gut was affected. The typical form of the disease led to increased mortality in quails during the last weeks of the rearing period [14]. The subclinical form of the disease condition caused chronic damage to the intestinal mucosa, which led to decreased digestion and absorption, reduced weight gain and increased feed-conversion ratio.

The morbidity and mortality were variable and were influenced by stress, overcrowding, coccidiosis, withdrawal of food and water, medication, inadvertent usage of antibiotics and management. Considering the paucity of information on quail diseases in Ramanathapuram district of Tamil Nadu, India where the quail and desi bird rearing are

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getting momentum, this paper tried to present two similar incidences of acute, severe mortality with ulcerative enteritis in quails during the rainy season of Tamil Nadu, India.

Materials and Methods

The present study reported an incidence of Ulcerative enteritis (UE) disease like associated symptoms caused by *Clostridium colinum*, encountered in two farms maintained at Dharkavalasai Village and another one at Kalugoorani Village of Ramanathapuram, Tamil Nadu. The 9 to 12 weeks old 250 carcasses of quails died due to ulcerative enteritis at quail farms in the above two sites during the months of October to December 2018 and pre and post episode information received from the farmers, information collected during on farm investigation and samples collected during post mortem examination of the carcasses served as the materials for this study.

Bacteriological Examination

Bacteriological cultural examinations were performed on intestinal contents collected during post mortem examination, as per [5].

Direct Microscopic Examination

Direct Microscopic examination of intestinal content was performed as per [21] to rule out coccidiosis.

Results and Discussion

The farm maintained at Dharkavalasai had two incidences of the disease during October and November 2018. The farm at Kalugoorani had the episode during the month of December 2018. At Dharkavalasai out of 10,000 birds 3800 birds succumbed to death in the first incidence with the mortality rate of 38% and 4900 out of 8000 with 61.3% of mortality in the second phase. At Kalugoorani farm a total of 4000 out of 5000 birds succumbed with a mortality rate of 80%. All the affected flocks of Japanese quails were in the age group of 9 to 12 weeks maintained under deep litter system. [19] reported about 80 to 90% of mortality among 4 to 12 weeks old parent Bobwhite quails in captive condition affected with ulcerative enteritis. [3] stated that the outbreak first started in semi-mature birds and is progressively spreading to younger birds. Anamnesis revealed that stress due to heavy rainfall, inadvertent use of antibiotics, overcrowding and soiled bedding materials had acted as the predisposing factors for the incidence and recurring of incidence at Dharkavalasai. [3] had also opined that antibiotic resistance due to inadvertent usage might lead to treatment failure and re-infection. The affected birds showed droopiness, ruffled feathers, weakness, in appetite and greenish white watery diarrhoea. [15] stated less or sudden change of feed, over-crowding, stress factors and other infectious agents like coccidiosis promoted this disease in quails and the affected birds may die in good physical condition without premonitory signs or appeared weak and depressed with ruffled feathers and diarrhoea.

Post mortem examination was conducted in a total of 250 carcasses (Fig 1). Necropsy revealed poor bodily condition of the carcass (Fig 2). Body cavity contained little amount of serosanguineous clear fluid. Intestine was ballooned with congestion of serosal vessels (Fig 3). Intestinal mucosa was highly eroded and the lumen contained mucosanguineous material (Fig 4). The intestinal wall was very thin. [8] and [9] reported necrotic enteritis with major lesions in small intestine

and which were often distended with gases with the necrotic mucosa and the lumen filled with foul smelling, brownish fluid, mixed with gas bubbles. In some cases the liver and spleen were congested and enlarged (Fig 5 and 6). In a few cases the liver showed pin point pale spots (Fig 7) which found to be extended deep in to the parenchyma on incision. [17] had also reported the same type of lesions in quails affected with ulcerative enteritis. Most of the deaths recorded were acute in nature without any premonitory signs and the post mortem findings in these two farms are similar to the findings of [15]. In both the present incidences there was no intestinal perforation. The serosanguineous clear fluid in the abdominal cavity in the present cases might be due to increased permeability of mesenteric and serosal vessels of intestine by severe inflammatory process.

Cultural analysis of bacteria showed evidences of *Clostridium colinum* which was isolated in pure culture from the liver and spleen of affected birds after 24-h incubation on TPGBA medium as suggested by [15]. Surface colonies on this medium were 0.5 mm in diameter, circular to slightly irregular, greyish white to colourless. The isolates were Gram-positive small rods, measuring 1 x 4 µm, and occurred singly or in pairs. Direct microscopic examination of intestinal content revealed no evidences of coccidial infestation.

Therapeutic management of the condition in the farm at Dharkavalasai, with 2.5g of Tetracyclin powder (Tetracyclin Hydrochloride, Intervet ®) in 1litre of drinking water for 5 days did not yield encouraging response. Megadox-N (Doxycycline with Neomycin water soluble powder) @ 1 gm in 5 litres of water for 5 days showed a slight improvement in controlling the mortality. However the problems were found to relapse. The treatment with LINCO-N (Lincomycin Hcl with Neomycin Powder) in feed @ 250 gm/ metric ton of feed for a continuous period of 1 week could completely stop the mortality. Hence, the second incidence at Kalugoorani was also treated with LINCO-N in the same dose rate and succeeded. In the adoptive period it was advised to treat the flocks with Ethnoveterinary medicinal preparations and insisted to follow strict bio-safety measures. Inadvertent usage of any medication might cause therapeutic irresponsiveness in living systems. In this study both the farm owners followed inadvertent usage of medicine in their farms. The treatment failure might be attributed to multi-factors like frequent change of antibiotics, self-medication, under/ over dosage of antibiotics, incomplete course of antibiotic therapy, associated with other environmental factors like recent history of heavy rainfall, soiled litter material and poor farm management practices. Stress by over-crowding was another factor leading to heavy mortality in both the farms. The birds about to lay eggs would usually be in stress and hence found to be the prime target for this condition.

It was advised to follow all bio-safety measures like fumigation, white washing, removing debris in the farm, changing bedding materials *etc.* Preventive measures like good management practices, avoiding restocking with new birds prior to quarantine, avoiding overcrowding, proper disposal of dead carcasses, pest control in and around the premises, and periodic treatment of watering systems with innocuous chemicals that dissolve mineral and or biofilm build-up were suggested to the farmers for further follow up. Presently both the farm is running successfully without any relapse of infection.



Fig 1: Post mortem examination of Japanese Quail Carcass



Fig 5: Congested and enlarged liver



Fig 2: Debilitated quail carcass



Fig 6: Congested and enlarged spleen



Fig 3: Ballooning of intestine



Fig 7: Enlarged liver with pin point pale spots lesions



Fig 4: Eroded intestinal mucosa and the lumen containing mucosanguineous material

Conclusion

Present study revealed the poor management practices pose threat to the whole unit. History of recent rainfall, stress in female birds under laying condition, overcrowding of the stock and other environmental factors might have caused a continuous and severe toll. The birds maintained under deep litter system with soiled litter material could be the probable source of re-infection existed in the farm irrespective of effective treatment. Self medication with large number of antibiotics without proper dosage and course of drug for treating the infection might leads to antibiotic resistance ultimately leads to non-responsiveness to the treatment. Finally a complete rest to the farming activity of both the

farms for a three months period with adoption of all bio-security measures rendered the farm owner to evade from the critical situation and now the two farms are running successfully.

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Conflict of interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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