



## INCIDENCE OF TURKEY POX IN ORGANISED FARMS

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### Abstract

*Outbreaks of turkey pox were reported in unvaccinated turkey poults of 6<sup>th</sup>, 8<sup>th</sup> and 10<sup>th</sup> week old in three organized turkey farms. Affected birds showed both cutaneous and diphtheritic form of pox lesions. Several coalescing, round nodular lesions were found in the eyelids, head, wattles and legs and some were superficially ulcerated. Post mortem examination revealed diphtheritic necrotic membranes lining the oral cavity and upper respiratory system in all the birds and intestinal congestion with severe tape worm infestation in the birds of third farm. Histopathological examination of the skin lesions showed large clusters of hypertrophic and hyperplastic epidermal stratified squamous epithelium, surrounded by dense fibroblastic stroma, swollen pale keratinocytes with a foamy, vacuolated cytoplasm and Bollinger bodies. Based on the clinical, post mortem and histopathological examination the disease outbreaks were confirmed as turkey pox. Advised to apply paste of neem leaves and turmeric externally and to give microsol antibiotic powder @ 4 gm/ litre of drinking water along with B- complex vitamin for 5 days. All the birds were given deworming with L-Mizole (Levamisole and Metronidazole) @ 10mg/100 birds in drinking water. Clinical signs in the affected birds disappeared completely in 6 weeks.*

*Key words: Turkey pox – Histopathology – Treatment.*

### I. Introduction

Avian pox is a common and economically important viral disease of chickens, turkeys, pigeons, and canaries, and it has been identified in more than 60 wild bird species (Tripathy, 1991). Pox is a slow-spreading disease characterized by the development of discrete nodular proliferative skin lesions on the nonfeathered parts of the body (cutaneous form) or fibrinonecrotic and proliferative lesions in the mucous membrane of the upper respiratory tract, mouth, and esophagus (diphtheritic form) (Docherty *et al.*, 1991). A concurrent systemic infection may also occur. The case report frequency has recently increased and involves newly affected bird species, indicating that this virus is an emerging disease. The present report records the concurrent occurrence of cutaneous and diphtheritic form of turkey pox disease in organised commercial turkey farms.

### II. Case History and Observation

Disease outbreaks were reported in three organized commercial turkey farms in Thirumangalam, Kammathanpatti and Othakkadai villages of Madurai district, Tamil Nadu, India. The farm owners brought dead turkey poults for post mortem examination with the history of having increased number of mortality in their turkey farm for the past 5 days.

Total number of birds were 135, 268, 428 in farm I, II and III respectively. The turkey poults were in the age group of 6<sup>th</sup>, 8<sup>th</sup> and 10<sup>th</sup> week and showed both cutaneous and diphtheritic form of pox lesions. Anamnesis revealed that the affected birds in all the three farms were having the blister like lesions in the eyelids, head, wattles and legs in the initial stage and after two or three days the blisters coalesce and formed firm masses at the eyelids, beak and legs. The flocks had not been vaccinated against pox.

On clinical examination, the dead turkey poults were found to be dehydrated and emaciated in nature. Several coalescing, round, brownish, rough and firm nodular lesions were found at the eyelids, head, wattles and legs and some were superficially ulcerated. Post mortem examination revealed diphtheritic necrotic membranes lining the oral cavity and upper respiratory system and intestinal congestion with severe tape worm infestation in the birds of third farm. It was observed that there were a lot of mosquitoes in all the three farms. Based on the clinical and post mortem examination the disease outbreak was suspected for turkey pox. The firm nodular lesions were collected and preserved in 10% formal saline for histopathologic examination. Based on the clinical and postmortem examinations the disease was diagnosed as turkey pox. The farmers were advised to house the affected birds separately and to apply paste of neem leaves and turmeric externally and to give microsol antibiotic powder @ 4 gm/ litre of drinking water along with B- complex vitamin for 5 days. The farmers were also advised to adopt proper sanitation techniques to keep the farm clean and free from mosquitoes as the mosquitoes play an important role in transmission of this disease. All the birds were given deworming with L-Mizole ( Levamisole and Metronidazole) @ 10mg /100 birds in drinking water.

Histologic sections of skin containing the nodular lesions had cords and large clusters of markedly hypertrophic and hyperplastic epidermal stratified squamous epithelium, surrounded by dense fibroblastic stroma. Lesions consisted of swollen and pale keratinocytes with a foamy, vacuolated cytoplasm and single, round, dense eosinophilic intracytoplasmic viral inclusions (identified as Bollinger bodies). Inclusions distended the cell cytoplasm, producing cell necrosis. Some of them had clear, unstained, central rounded spaces. The superficial epidermis of the lesions was ulcerated with eosinophilic, amorphous keratinaceous crusts and necrosis. Based on the clinical, post mortem and histopathological examination the disease outbreaks were confirmed as turkey pox.

### **III. Results and Discussion**

The morbidity rates were 17.0% (23 birds), 13.4 % (36 birds) and 30.8%(132 birds) in farm I, II and III respectively. The mortality rates were 7.4 % (10 birds), 6.0 % ( 16 birds) and 18.2% ( 78 birds) in farm I, II and III respectively (Table 1). In farm III the mortality rate was higher in younger birds and the increased number of deaths might have been aided by heavy tape worm infestation. Clinical signs in the affected birds lasted for about 6 weeks and after that lesions disappeared completely.

Avian pox is a slowly developing disease resulting in morbidity and mortality among all age groups and sexes and is distributed worldwide in commercial poultry (Ciganovich, 1999). The diagnosis of a pox virus infection could be suspected by external clinical examination and gross lesions (Heuschele, 1986), but it was necessary to confirm the disease in the cutaneous form by the presence of characteristic Bollinger bodies in epithelial cells of epidermis observed in histopathologic analysis, or by virus isolation (Heuschele, 1986 and Randall and Reece, 1996).

In the present study the gross lesions in the turkey poults were compatible with an avian pox diagnosis, and this fact was confirmed by the histopathologic analysis performed on the poults. Pox virus is not fatal in all infected individuals, but it can reduce viability and predispose affected birds to secondary infection (Reece, 1989). Thus Pox virus infection was an important, if not the direct cause of death in bird. Avian pox was a transmissible disease that was spread by biting arthropods such as mosquitoes and mites, and aerosols generated from infected birds, or the ingestion of contaminated food or water (Bolte *et al.*, 1999).

Mosquitoes feed on a viremic bird or contaminated lesion and then feed on a healthy bird, transmitting the virus. It is believed that mosquitoes can harbor the virus for a month or more. In the present study mosquitoes were considered to be an important vector for the spread of turkey pox virus in the three flocks. An increase in fowl pox cases has been seen to match the mosquito season (Tripathy and Reed, 2003). In the present study also the mosquitoes in the farms might have responsible for the

transmission of the disease. Clinical signs in the affected birds lasted for about 6 weeks and after that the lesions disappeared completely.

Table -1: Morbidity and mortality pattern of turkey pox disease outbreak in three turkey farms

<b>Farm</b>	<b>Total strength</b>	<b>Morbidity</b>	<b>%</b>	<b>Mortality</b>	<b>%</b>
<b>I</b>	<b>135</b>	<b>23</b>	<b>17.0</b>	<b>10</b>	<b>7.4</b>
<b>II</b>	<b>268</b>	<b>36</b>	<b>13.4</b>	<b>16</b>	<b>6.0</b>
<b>III</b>	<b>428</b>	<b>132</b>	<b>30.8</b>	<b>78</b>	<b>18.2</b>
<b>Total</b>	<b>831</b>	<b>191</b>	<b>23.0</b>	<b>92</b>	<b>11.1</b>

The disease may be complicated with parasitism or poor condition of the flock (Rajendra Singh *et al.*, 1990). As the worms compete with birds for food, the birds would be deprived of the nutrients and increase the susceptibility of the birds to diseases. In the present study also the increased number of deaths in the turkey poults might have been aided by heavy tape worm infestation. Young birds are most commonly affected with tapeworms and this might be a reason for higher mortality rate in the flock of young birds in the present study. There is no successful treatment for turkey pox. Antibiotics can be administered to control secondary bacterial infections, particularly in birds with respiratory and gastrointestinal lesions. In the present study antibiotics, deworming of the birds and proper sanitation of the farms would have saved the remaining birds in the farms.

Proper management was recommended to ensure good sanitation, deworming and proper vaccination for effective disease prevention in subsequent flock.

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