



Incidence of respiratory infections in chicken in Odisha

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ABSTRACT

The present study was aimed to investigate the incidence of respiratory infections in chickens of different districts of Odisha. The carcasses showing respiratory lesions like air sacculitis, haemorrhagic tracheitis, tracheal congestion, pneumonic lungs and nodular lungs were included in the study to correlate with the respiratory infections. The overall mortality in the study period was around 11%. March showed the lowest mortality while in August it was highest. Most deaths occurred during the months of April to August due to hot and humid climate. The rainy season was more vulnerable to respiratory diseases. The morbidity and mortality was highest in 3 weekold chicks. Aspergillosis, colisepticaemia, chronic respiratory disease, IB, infectious laryngotracheitis (ILT) and pneumonia were diagnosed.

Key words: Chicken, lungs, mortality, respiratory infections, trachea

INTRODUCTION

One of the pivotal causes of loss in poultry industry is morbidity and mortality due to various types of infectious and noninfectious conditions. Among the various causes, there is significant share of respiratory infections that needs specific attention. Therefore, the diseases of respiratory system. Therefore, this necessitates the study of diseases to minimise the loss.

The poultry sector is more susceptible to respiratory infections due to their structural anatomy (and presence of air sacs). The respiratory affections have multiple etiological agents like bacteria, virus, fungus coupled with unsatisfactory managemental practices (Laxman *et al.* 2006). There are number of factors which predispose the respiratory tract ailments of chicken, like secondary

bacterial infection, extreme temperature, weather, environmental fluctuations, diet changes, transport, routine vaccination and management inadequacies. When birds are affected with respiratory infection, it is difficult to control as it rapidly spread to entire farm. In addition, there is increase in morbidity and mortality, loss in production which in turn upsets the socioeconomic status of the dependent farmers.

Therefore, the present study was undertaken to investigate the incidence of respiratory infections in chickens from different districts of Odisha.

MATERIALS AND METHODS

The present work involved post mortem examination of chickens followed by histopathological examination, microbiological

investigation and spread from 126 small and medium poultry units for a period of about 12 months from Aug 2011 to July 2012 in different districts of Odisha.

The observed signs along with history were recorded from the owners and attendants of the concerned units. The dead birds presented for necropsy at Department of Veterinary Pathology showing respiratory lesions were selected for our study and subjected to meticulous post mortem examination. The carcasses showing respiratory lesions like air sacculitis, haemorrhagic tracheitis, tracheal congestion, pneumonic lungs and nodular lungs were included in the study to correlate with the respiratory infections.

Microbiological investigation

Samples were collected for bacteriological investigation from some of the selected fresh carcasses. Swabs were collected aseptically from the affected organs, inoculated into nutrient broth or brain heart infusion broth and incubated at 37°C for 24 hrs for primary isolation. Smears were made from the positive tubes indicated by development of turbidity in the broth, fixed over flame and stained with Grams stain. The broth culture was further subjected to isolate pure culture and identification was made by streaking on various differentiating media like blood agar, nutrient agar, MLA and EMB.

For suspected fungal infections, samples of tissues especially nodular lungs were incubated in Saubaraud's Dextrose Broth /agar for 1 week and examined under microscope.

Some of the Infectious Bronchitis suspected samples such as trachea with bronchial plugs, lungs, caecal tonsils and spleen in 50% Glycerol Saline (PM No.1026-37/12) were sent to Indovax, Research and Development. Lab, Gurgaon. For confirmation of Infectious Bronchitis infection, Reverse Transcriptase Polymerase Chain Reaction was conducted.

The generated data pertaining to respiratory involvement was analysed using Microsoft Excel data analysis tools. For this purpose the year was divided into three seasons viz. winter (October to

January), summer (February to May) and rain (June to September). The age was categorized into 1 - 6 weeks. The diseases were grouped into six categories viz. Aspergillosis, Coli Septicaemia, Chronic Respiratory Disease, Infectious Bronchitis, Infectious Laryngotracheitis and Pneumonia.

RESULTS AND DISCUSSION

Mortality due to different diseases exclusively involving respiratory system was investigated during a period of about one year in 126 small and medium scale poultry units from 11 districts (4 coastal, 5 non coastal and 2 western hilly area) were included in the study. In the study a total of 66.6 thousand birds (11%) died out of about 5.64 lakh birds (89%) exposed to disease outbreak risks.

Mortality in different units varied from lowest of 1538 (10.2%) in the month of March to highest of 13603 (12.8%) in August as shown in graph 1. Highest number birds of 35.4 thousand died during rainy season where more than 2.56 lakh birds were exposed in about 46 units. The maximum mortality was 12.7 thousand in 3 week birds while minimum was 9.1 thousand in 2 weeks age with an average of 11.1 thousand which is clear from Fig.3.

The minimum mortality of 23.7 thousand was recorded in the later part of the year 2011 while the maximum death in the first part of 2012 was 42.9 thousand. The average mortality was 33.3 thousand.

The disease conditions were grouped into 6 categories depending on clinical findings, post mortem findings, histological examination, microbiological examination and RTPCR viz. Aspergillosis, Colisepticaemia, Chronic respiratory disease, Infectious bronchitis, Infectious laryngotracheitis and Pneumonia.

Aspergillosis cases revealed distinct nodules of 1-5 mm diameter throughout the lungs (Pascalet *al.* 2011) and air sacs. Crushed nodules on slide revealed conidiophore and hyphae on lactophenol cotton blue stain. Also fungal hyphae could be identified in the sections (Sivaseelan *et al.* 2009).

Escherichia coli are also associated with respiratory infection in chickens (Popy *et al.* 2011).

In most instances of Colisepticaemia, air sacs, were thickened, cloudy in appearance coated with cheese like fibrinous deposits with inflammation. Respiratory colibacillosis is a respiratory disease caused by secondary infection with pathogenic *Escherichia coli* (Glisson, 1998). Manju Pal *et al.* (2006) revealed adhesiveness of *E.coli* to chicken tracheal epithelium.

In cases of chronic respiratory disease the air sacs contained cheese like tenacious material., Also there was presence of exudates in nasal passage, trachea and bronchi including air sacs. If the infection is uncomplicated then chickens can show no outward signs. Thus, the condition may go unnoticed until the birds are slaughtered and the typical lesions are seen. Birds with airsacculitis are condemned (Shankar, 2008).

In respiratory form of infectious bronchitis, there was excess of mucous in the respiratory tract. Lungs were congested. Air sac walls were cloudy and thickened. The findings were in congruous with various workers (Cook *et al.* 2012). Caseous exudate/ plug were present in the lower trachea and bronchi, in syrinx as reported earlier (Chandra Naik *et al.* 2005; Bhubaneswari *et al.* 2009). Tracheal rings were severely inflamed with reddening of the tracheal rings. Confirmation of IB

through RT PCR was also made by other workers (Sjaak *et al.*, 2011)

Although ILT is distributed world-wide, the disease may be present only in certain localities within a country or geographic region. The greatest incidence of disease is generally seen in areas of highly intensive poultry production (Bagust *et al.*, 2000). Infectious laryngotracheitis has also caused significant respiratory problems in broilers greater than 3 weeks of age (Shankar, 2008) Haemorrhagic tracheitis with obstructive plugs of blood and mucinous exudate were often seen (Bagust *et al.*, 2000; Srinivasan *et al.*, 2012). Trachea was inflamed red and contained blood filled mucus. In some trachea there was blood casts throughout the entire trachea or part of its length. Trachea was very much congested in some cases. Lungs and air sacs were not often affected but there was congestion of lungs in some cases. ILT was confirmed by the presence of intranuclear inclusion bodies in tracheal epithelium. Other workers also diagnosed ILT on the basis of intranuclear inclusion body (Bagust *et al.* 2000; Srinivasan *et al.* 2012; Ebrahimi *et al.* 2001; Sivaseelan *et al.* 2013).

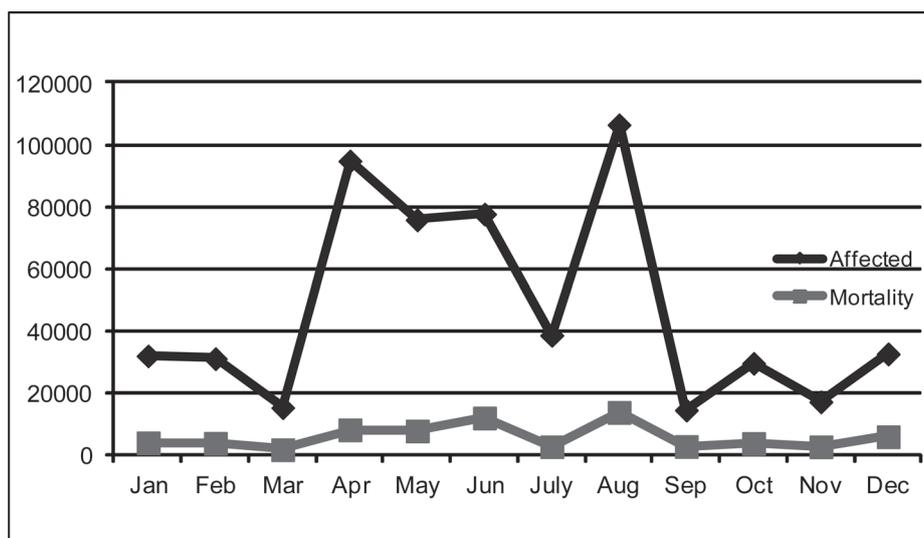


Fig.1. Monthwise distribution of affected and dead chicken.

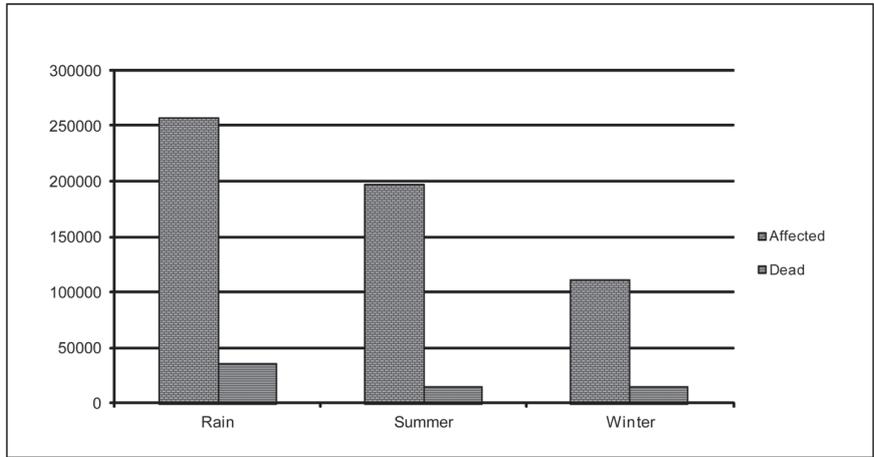


Fig.2. Seasonal distribution of disease

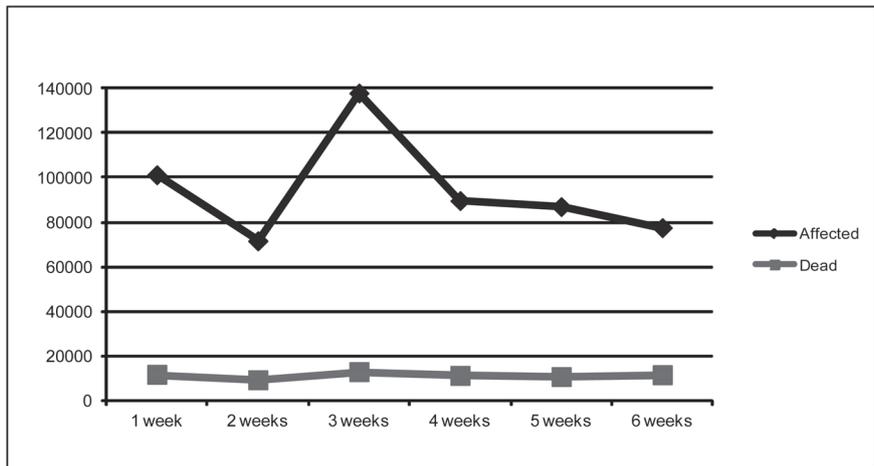


Fig. 3. Age wise distribution of disease

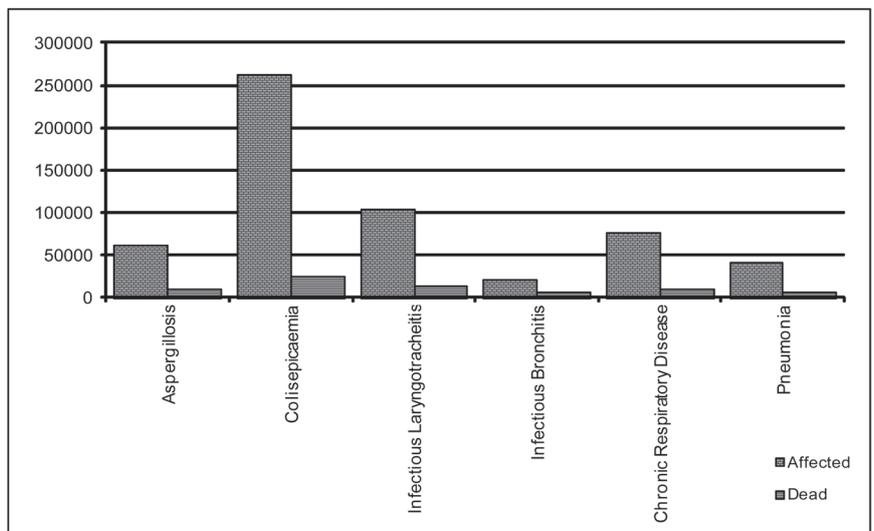


Fig. 4. Disease wise mortality of birds

CONCLUSION

The present endeavour explored the diseases affecting the respiratory system in poultry. Aspergillosis, Colisepticaemia, chronic respiratory disease, infectious bronchitis, infectious laryngotracheitis and pneumonia were diagnosed on the basis of post mortem examination, histopathological examination, microbiological investigation and RTPCR. The overall mortality in the study period was around 11%. March showed the lowest mortality while in August it was highest indicating that rise in temperature decreases disease affection and cold season is at risk for respiratory diseases. (Uddin *et al.* 2015)

The rainy season was more vulnerable to respiratory diseases when 35 thousand birds died. This was followed by summer (19.5 thousand) and winter (11 thousand) i.e., presented in graph 2. The morbidity and mortality was highest in 3 week old chicks (1.3 lakh exposed and 12.7 thousand dead). Coli infection was more common killing 23 thousand out of 2.6 lakh birds exposed birds. ILT was second highest followed by aspergillosis and Chronic Respiratory Disease (10 thousand and 9.7 thousand respectively) exhibited in graph 4. Respiratory involvements like ILT, IB, Aspergillosis, CRD and coli infection in chicken most commonly cause immense loss to the entrepreneurs of the industry for which early detection of these diseases is required through all these diagnostic procedures.

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