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A retrospective study on the diseases and conditions causing mortality in a poultry farm

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Abstract

This analysis was undertaken to study the diseases and conditions causing mortality in the poultry farm of Livestock Farm Complex, Veterinary College and Research Institute, Orathanadu over a period of 10 years from 2013 to 2023. A total of 324 dead birds (154 chick cum grower stage and 170 under breeder category) were examined during the study based on many factors and mainly by characteristic post-mortem gross pathological lesions. Based on the postmortem findings, commonly observed viral diseases (Infectious bursal disease, Ranikhet disease and Fowl pox), Bacterial disease (Pasteurellosis and Colibacillosis), fungal (Pneumonia) and Protozoal disease (coccidiosis). Similarly, the gross lesions causing mortality was studied based on the various systems of the poultry. Gross lesions observed in digestive system were Hepatitis and enteritis, nephritis and gout were observed in urinary system. Oviduct impaction / prolapse, egg peritonitis, vent gleet, salpingitis and yolk sac infection were the conditions observed in reproductive system. Fatty liver hemorrhagic syndrome and ascites were the commonly observed metabolic disorders, rickets under nutritional deficiency disorder. The other miscellaneous conditions causing mortality were anaemia, debility, toxemia, shock and pecking.

Keywords: Gross lesions, retrospective study, poultry farm, diseases and conditions

Introduction

Poultry farming in India, has attained huge leaps and has progressed tremendously in the last few decades though it has faced several constraints. Considering the total egg production of the world, India contributes 7 percent of the egg production, and 2.42 per cent of the total meat production (Singh, 2022) [15]. Both the commercial poultry farming (broilers and layers) and backyard poultry farming (desi birds and upgraded desi birds) together contribute the major poultry population in India. The adoption of the new technologies in the poultry sector has made poultry industry as one of the specialized enterprises in India (Vetrivel and Chandrakumarmangalam, 2013) [18].

The major constraint affecting the farmers in poultry farming is the loss faced due to mortality of the birds. This in turn decreases the profit margin and leads to severe economic loss. The prevalence of diseases in each location depends on the geographical location of the farm, type of housing, method of rearing, feeding and watering systems followed by the farmer, less knowledge on the diseases affecting poultry and the vaccination and deworming schedule to be followed, unaware of the breeds suitable for their location, improper bio-security measures maintained in the farm etc. This retrospective study emphasized on the disease conditions causing mortality in the Poultry Farm, of Livestock Farm Complex, Veterinary College and Research Institute, Orathanadu for a period of 10 years to understand and identify the common bacterial, viral and protozoal diseases, conditions affecting the various systems of poultry, nutritional and other managerial conditions encountered in the farm so that proper control measures can be undertaken to minimize the mortality.

Materials and Methods

This study was based on the mortality of birds recorded in the Poultry Farm of Livestock Farm Complex, Veterinary College and Research Institute, Orathanadu. The dead birds were sent to the Department of Veterinary Pathology, Veterinary College and Research Institute,

Orathanadu for post mortem examination and disease diagnosis. The data for this study were recorded from the year April 2013 to March 2023. A total of 324 dead birds of which 154 birds under chick cum grower and 170 birds from breeder category which were examined for postmortem were taken for this study. Other parameters like brooder, grower, layer and breeder age groups, sex of the birds were taken into consideration. Any disease affected in the past history, the clinical signs and symptoms exhibited by the birds before death, gross post mortem lesions, percentage of morbidity and mortality, laboratory investigations for bacterial and parasitological examinations (Samad, 2005) [12]. But for viral diseases the classical post mortem lesions were taken as diagnosis.

Results and Discussion

The diseases affecting the poultry were classified into viral, bacterial and protozoal diseases. Other categories include nutritional and metabolic disorders and death due to managemental aspects. Similarly the conditions causing mortality has been classified based on the conditions affecting the various systems affecting the poultry like alimentary, respiratory, urinary and reproductive systems. The percentage of mortality in chick cum grower stage and breeder stage has been given in Table 1.

The mortality pattern shows that Infectious bursal disease and Ranikhet disease has been reported during the chick cum grower stage whereas during the breeder stage, Ranikhet disease was reported in the category of viral diseases. The higher incidence (25.97 %) of infectious bursal disease was due to an outbreak in the year 2018-2019. In a study made by Sathyamoorthy *et al.*, (2018) [14] reported the incidence of infectious bursal disease in 16 days old desi broiler chicken in a farm at Hyderabad this in accordance to this study. To prevent an outbreak of infectious bursal disease, proper sanitation has to be done, prevent the contamination of the shed, give sufficient downtime period between the flock of birds, proper biosecurity steps have to be taken and vaccination at the appropriate age all these factors will help to control infectious bursal disease in a poultry farm.

Among the viral diseases, Ranikhet disease is imposing a major threat to the poultry industry. The breeder flock has been vaccinated against the Ranikhet disease as per the vaccination schedule,

Fowl pox was recorded as 1.95% only in chick cum grower stage in our study. No cases were reported in the breeder stage. This disease spreads by direct contact from infected birds to other birds in the farm, mosquitoes also act as a source of infection. (Adebajo *et al.*, 2012) [11].

The most commonly found bacterial disease is colibacillosis (17.54% in chick cum grower period and 9.41% in breeders). The death due to *E.coli* infection was recorded in all age groups in our study which is in accordance with Rahman *et al.*, (2004) [11] and Kabir, (2010) [6]. Most of the bacterial diseases spread through feed and water which is infected, intensive farming method also contributes as one of the factor for the spread of the bacterial diseases.

Fowl Cholera or Pasteurellosis is said to be one of the oldest poultry diseases and is commonly found in the age group above 16 weeks but reported rarely in birds less than 8 weeks of age (Petersen *et al.*, 2001; Glisson *et al.*, 2008) [5, 3] this is in accordance to our study since 1.18% of the mortality was recorded only in breeders.

Pneumonia may be due Aspergillosis or dusty environment, litter and feed which are mouldy. Proper storage of feed, use of fresh feed and quality analysis of the feed in regular intervals helps in the prevention of the disease (Kunkle *et al.*, 2003) [7].

Intestinal coccidiosis (1.30%) was reported under the protozoal disease only during the chick cum grower stage. Studies made by Toulah (2007) [16] and Nematollahi *et al.*, (2009) [9] also reported coccidiosis in the age group of 3 to 18 weeks, temperature and humidity in that region lead to the major spread of oocysts in the environment. This is in accordance with this study.

Commonly observed nutritional disorder is ricket. Other metabolic disorders observed were fatty liver haemorrhagic syndrome and ascites.

The common conditions observed in digestive system and causing mortality were hepatitis and enteritis. Nephrosis and gout were the common conditions observed in the urinary system. Abnormal accumulation of urates in certain internal organs due to metabolic disorder results in gout. Mortality by gout in birds were recorded by Vadivoo *et al.*, 2020 [17] and Mudasir *et al.*, 2017 [8]. It has been reported that avoiding concentrate feed with only maize diet helped in the control of gout. Inclusion of ammonium sulphate 5g per kg feed also helped in the control of gout.

Yolk sac infection, oviduct impaction or prolapse, egg peritonitis and vent gleet were the common conditions observed in reproductive system causing mortality in the poultry farm. Death due to egg peritonitis was 8.82 and due to salpingitis was 4.71 per cent in this study. But Chitradevi, 2022 [2], reported very less prevalence of prolapse and egg bound in that study.

The common condition observed in respiratory system is pneumonia. The poultry farmers worldwide are facing great economic loss due to complex respiratory infection. Hafez, 2002 has reported that microorganisms of the genus *Pasteurella*, *Mycoplasma*, *Bordetella* and *Haemophilus* are the causative agent for respiratory diseases complex.

The other miscellaneous conditions causing mortality are anaemia, debility, toxemia, shock, inanition, pecking and cannibalism (9.41% during the breeder stage) were recorded in the farm in the last ten years in this study. Vadivoo *et al.*, 2020 [17] observed pecking in chick stage. These studies are in contrary to our study where pecking was observed mostly in the adult stage. Pakhira *et al.*, 2016 stated that beak trimming, proper housing and feeding management, removal of the birds with vices and proper selection of birds for next generation will help to prevent vices in the poultry farm.

This study has helped to understand and identify the common diseases, conditions affecting the various systems of poultry, nutritional and other managemental conditions affecting the farm so that proper control measures can be taken to minimize the mortality.

Table 1: Incidence of diseases and other conditions causing mortality in chick cum grower and breeders in the poultry farm

| Diseases/Conditions | % of incidence in chick cum grower stage | % of incidence in breeder stage | Diseases/Conditions | % of incidence in chick cum grower stage | % of incidence in breeder stage |
|--|--|---------------------------------|----------------------------|--|---------------------------------|
| Viral Diseases | | | Alimentary System | | |
| Infectious Bursal disease | 25.97 | - | Hepatositis | 11.69 | 21.18 |
| IBD+RD | 3.90 | - | Enteritis | 1.30 | 4.12 |
| Ranikhet disease | 1.95 | 2.35 | Hepatic tumor | - | 0.59 |
| Ranikhet disease + Gout | 0.65 | - | Inanition | - | 0.59 |
| Fowl pox | 1.95 | - | Urinary System | | |
| Hydropericardium Syndrome | - | 0.59 | Nephrosis | 16.88 | - |
| Bacterial Diseases | | | Gout | 3.90 | - |
| Colibacillosis | 17.54 | 9.41 | Reproductive System | | |
| Pneumonia | 1.30 | 4.12 | Yolk sac infection | 2.60 | - |
| Pasteurellosis | - | 1.18 | Oviduct impaction/prolapse | - | 1.76 |
| Protozoal Diseases | | | Egg peritonitis | - | 8.82 |
| Intestinal coccidiosis | 1.30 | - | Vent gleet | - | 0.59 |
| Nutritional deficiency disorder | | | Salphingitis | - | 4.71 |
| Rickets | 4.55 | - | Other conditions | | |
| Metabolic | | | Anaemia | 0.65 | - |
| Fatty liver hemorrhagic syndrome | - | 2.35 | Debility | 1.95 | 1.18 |
| Ascites | - | 0.59 | Toxaemia | - | 0.59 |
| | | | Shock | - | 1.18 |
| | | | Pecking / Cannibalism | - | 9.41 |

Conclusion

In summary, our study comprehensively classified poultry diseases into viral, bacterial, protozoal, nutritional, metabolic disorders, and managerial factors affecting mortality. Notably, infectious bursal disease and Ranikhet disease were prevalent during the chick cum grower stage, whereas Ranikhet disease remained a concern during the breeder stage. Effective preventive measures, including sanitation, biosecurity, and vaccination, were recommended to control infectious bursal disease outbreaks. Bacterial diseases like colibacillosis and pasteurellosis posed significant threats, with factors such as feed and water contributing to their spread. Additionally, protozoal diseases like intestinal coccidiosis were observed, linked to environmental factors like temperature and humidity. Nutritional disorders and metabolic issues were also identified, along with various conditions affecting different systems, including the alimentary, urinary, reproductive, and respiratory systems. Proper management practices, including diet optimization and housing conditions, were emphasized to mitigate mortality rates. This study enhances our understanding of poultry diseases, aiding in the development of targeted control measures to minimize losses in the poultry industry.

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