

Original Article

Prevalence of infectious diseases in Sonali chickens at Bogra Sadar Upazila, Bogra, Bangladesh

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ABSTRACT

Objective: The study was conducted to determine the prevalence of infectious diseases in Sonali chickens at Bogra Sadar Upazila, Bogra, Bangladesh.

Materials and methods: A total of 258 sick and dead Sonali chickens were examined for the diagnosis of different infectious diseases based on history, clinical findings and postmortem lesions of dead and sacrificed birds.

Results: Infectious Bursal disease (IBD) was recorded in 14.72% (n=38/258) cases. Similarly, Newcastle disease (ND), Coccidiosis, Colibacillosis and Mycoplasmosis were recorded in 11.24% (n=29/258), 13.95% (n=36/258), 14.72% (n=38/258), 12.79% (n=33/258) cases, respectively. Mixed infection of IBD, ND and Coccidiosis found in 16.67% (n=43/258) birds. On the other hand, mixed infection of IBD, ND and colibacillosis was recorded in 15.89% (n=41/258) cases.

Conclusion: It is concluded that several infectious diseases are commonly present in Sonali chicken in the study area of Bangladesh. Mixed infections are more prevalent as compared to single infection. Proper hygienic management and appropriate vaccination should be taken in consideration for effective control the diseases. Further microbiological and molecular diagnoses are suggested for detail studies of these diseases and their pathogens.

KEYWORDS

Clinical findings; Infectious disease; Post mortem; Sonali chicken

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INTRODUCTION

Poultry industry plays an important role in Bangladesh in fulfilling the protein demand of human ([Islam et al. 2014a](#)). It is considered as the farmers' first investment in the livestock ladder as a way of income generation. The poultry meat alone contributes a substantial 37% of the total meat production in Bangladesh ([Begum et al., 2011](#)). The commercial poultry production by the private sector is expanding rapidly in Bangladesh. This industry can provide opportunities for the increase of Gross Domestic Product (GDP) growth rate through ensuring food security and self-employment, and finally reducing poverty.

Sonali chickens are well adapted in the environmental conditions of Bangladesh, as it requires less care and attention as compared to other breeds. It is also easier for women to rear ([Saleque and Saha, 2013](#)). In spite of many positive reasons behind rearing of Sonali chickens, there are some causes that hamper in optimum production of Sonali chicken by smallholder households in Bangladesh ([Biswas et al. 2006](#)). Poultry diseases are one of the major constraints for developing poultry industry in Bangladesh ([Islam and Samad, 2004](#)). Prevalence of diseases in a particular area depends on various factors like geo-climatic condition, management practices, immunization status, and social awareness.

Prevalence of infectious diseases is considered for establishing a commercial poultry farm. The northern part of Bangladesh is considered as a poultry hub especially of Sonali chicken, which is used as meat purpose. [Biswas et al. \(2006\)](#) reported that about 28% mortality of Sonali chickens in southeastern coast of Bangladesh due to outbreak of several infectious diseases. However, very few studies have been reported on prevalence of infectious diseases of chickens of northern part of Bangladesh. Thus, this study was aimed at investigate the prevalence of various infectious diseases of Sonali chickens in the northern part of Bangladesh.

MATERIALS AND METHODS

The study was performed at District Livestock Hospital, Bogra from September to November, 2015. It was noted prevalence of infectious diseases was comparatively higher in late autumn period as compared to other seasons of the year ([Gunnarsson et al., 2012](#)). So, our experiment was performed covering that season. A total of 258 sick and dead Sonali chickens were examined for diagnosis of diseases. The live birds were sacrificed according to standard animal care guidelines giving them minimum pain. The clinical findings and owner complaints were also recorded.

Diagnosis of Disease: The birds were examined and recorded the post mortem findings as per the method described by [Swayne et al. \(2013\)](#). The clinical signs and post-mortem findings of different diseases are mentioned below.

Infectious bursal disease (IBD): The observed clinical signs of IBD were severe depression, inappetance, ruffled feather, vent pecking, limy diarrhea, and rise of body temperature. Post mortem findings included hemorrhages in the thigh and pectoral muscles, swollen and enlarged bursa. Kidneys are enlarged and urate deposition in the tubules.

Newcastle disease (ND): The observed clinical findings of ND were sudden death, fluff up feathers, body coat dragging on the ground, lethargy, inappetance, respiratory distress, gasping and greenish diarrhea. Nervous signs included tremor, torticollis, convulsion and paralysis of wings and legs. Post-mortem findings included pin point hemorrhages at the tip of proventricular glands, hemorrhage and necrotic ulceration on the wall of intestine and cecal tonsils, and marked congestion of trachea.

Colibacillosis: The observed clinical findings of colibacillosis were coughing, sneezing, reduced appetite, poor growth and omphalitis. Whitish covering on liver and heart, edematous epicardium covered with yellowish and fibrinous exudates, enlarged and congested yolk sac were observed in post-mortem examination.

Coccidiosis: Bloody diarrhea, dehydration, depression, emaciation, and poor growth rate were demonstrated as clinical findings. Post-mortem findings showed hemorrhages and engorged clotted blood in cecum.

Mycoplasmosis: The clinical signs of mycoplasmosis included tracheal rale, nasal discharge, coughing, facial edema, lacrimation and reduced feed consumption. In post-mortem findings, cloudy air sac, pericarditis, perihepatitis, congested and mucoid trachea were demonstrated.

RESULTS AND DISCUSSION

Among the 258 Sonali chickens examined in this study, IBD was recorded in 14.72% (n=38/258) chickens, whereas ND, Coccidiosis, Colibacillosis and Mycoplasmosis were found in 11.24% (n=29/258), 13.95% (n=36/258), 14.72% (n=38/258), and 12.79% (n=33/258) samples respectively (**Table 1**). A mixed infection of IBD, ND and Coccidiosis was found in 16.67% (n=43/258) samples, and IBD, ND and Colibacillosis was found in 15.89% (n=41/258) chickens

(Table 1). The post-mortem findings of different poultry diseases have been demonstrated in the Figure 1-5.

Table 1: Prevalence of infectious diseases of Sonali chickens

SL.	Name of disease	Positive (%)
1.	Infectious bursal disease (IBD)	38 (14.72)
2.	Newcastle disease (ND)	29 (11.24)
3.	Coccidiosis	36 (13.95)
4.	Colibacillosis	38 (14.72)
5.	Mycoplasmosis	33 (12.79)
6.	IBD + ND + Coccidiosis	43 (16.67)
7.	IBD + ND + Colibacillosis	41 (15.89)
Total		258 (100)

The prevalence of IBD found in our study was similar to the reports of several authors (Kim et al., 1996; Saha and Majumder, 1997; Sil et al., 2002; Khan et al., 2009; Ahmed et al., 2009; Chakma, 2015). However, Saleque et al. (2003) recorded 45.3% mortality in broiler birds due to IBD; this variation might be due to the difference in geographical location, environmental conditions and strain differences of the virus. The virus can survive in environmental stress condition (Camilotti et al. 2016). In our study, mixed infection of the diseases were very common in the study area. Therefore, unhygienic environment of the farm might be increases the susceptibility of infection.

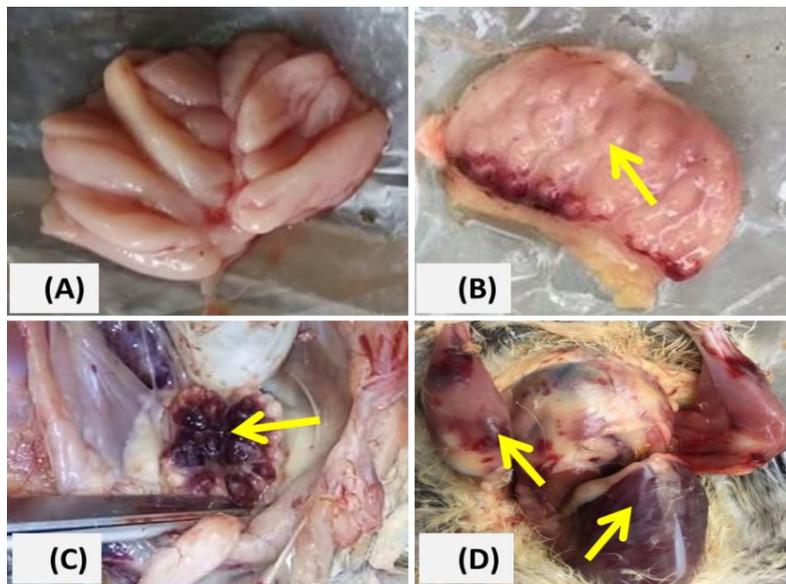


Figure 1: Post-mortem findings of Infectious Bursal Disease. (A) normal bursa-no edematous swelling and hemorrhage, (B,C) swollen, hemorrhagic and edematous bursa. Hemorrhage in the thigh and pectoral muscles (D)

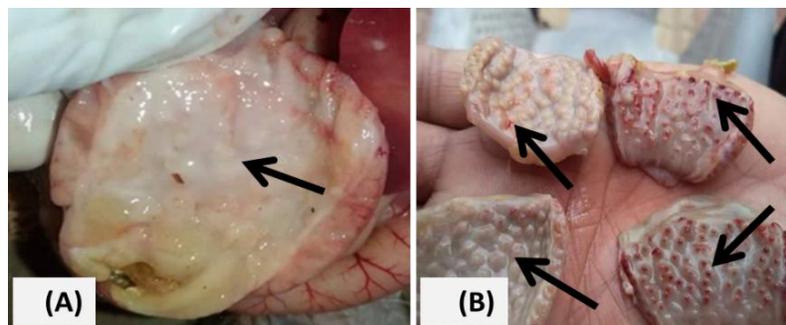


Figure 2: Post-mortem findings of Newcastle Disease. (A) normal proventriculus, (B) pin point hemorrhage at the tip of proventricular gland.

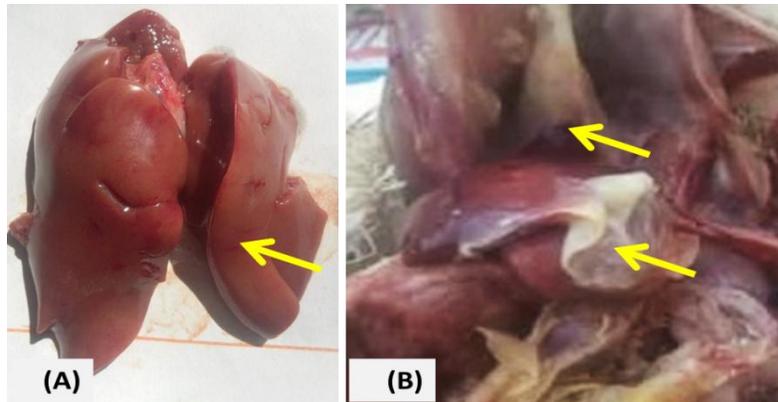


Figure 3: Post-mortem findings of colibacillosis. (A) normal liver, (B) diseased heart and liver covered with yellowish white fibrinous exudates.

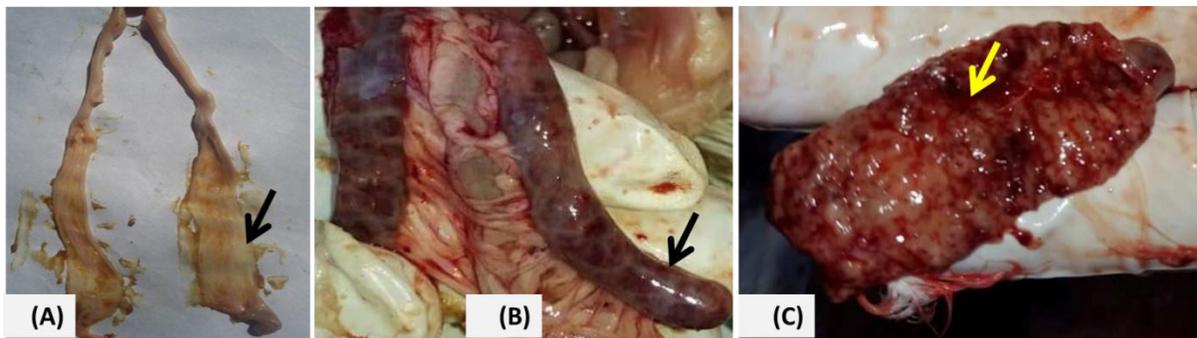


Figure 4: Post-mortem findings of coccidiosis. (A) normal cecum, (B,C) cecum engorged with clotted blood.

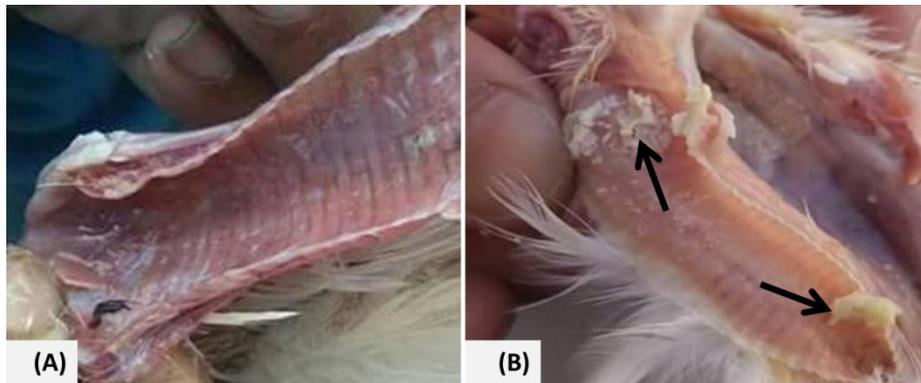


Figure 5: Post-mortem findings of mycoplasmosis. (A) fresh trachea, (B) congested and mucoid exudate in trachea.

[Giasuddin et al. \(2002\)](#) reported 7.5% prevalence of ND, which is lower than the report of our study. [Hasan et al. \(2016\)](#) reported necropsy findings of ND of chickens that included pin point hemorrhage in the proventriculus, hemorrhagic lesion in the intestine and trachea; this findings are in support of our study. [Biswas et al. \(2006\)](#) reported mortality of Sonali chicken by ND was 11%, which supports our present finding. Our findings also inclined with the reports of [Islam et al. \(2014b\)](#) and [Saleque et al. \(2003\)](#) who reported the prevalence of ND as 14.1% and 8.8%, respectively in different regions of Bangladesh.

Coccidiosis was recorded 13.95% chickens in our study, which is higher than the findings of [Ahmed et al. \(2009\)](#) and [Islam et al. \(2014a\)](#). Improper litter management and unhygienic condition of poultry shed are the significant factors for increasing the susceptibility of coccidiosis infection. It has been reported that, the disease occurs mainly in wet season with high frequency in young chickens ([Kaboudi et al. 2016](#)). [Sharif \(2002\)](#) also reported that improper cleaning of poultry shed and disinfection before introducing day old chicks increase the susceptibility of coccidiosis in poultry farm. Clinical

findings and post mortem lesions supported by [Calnek et al. \(1997\)](#).

[Khan et al. \(1998\)](#), [Rahman et al. \(2007\)](#) and [Ahmed et al. \(2009\)](#) reported almost similar prevalence of colibacillosis as our study. Prevalence of the disease also reported by [Hasan et al. \(2016\)](#), and [Saleque et al. \(2003\)](#) as 8% and 7.4%, respectively. Both single and mixed infection of colibacillosis causing 28% mortality in Sonali chicken, as reported by [Biswas et al. \(2006\)](#), which supports our findings. The prevalence of colibacillosis is higher in summer as compared to other seasons, which support our findings.

The prevalence of mycoplasmosis found in our study was similar to the report of [Ahmed et al. \(2009\)](#). Clinical findings and post-mortem lesions (**Figure 5**) of mycoplasmosis found in our study was also supported by [Ahmed et al. \(2009\)](#), [Islam et al. \(2014a\)](#), and [Hasan et al. \(2016\)](#). Prevalence of mycoplasmosis is mostly found during winter season, as reported by [Haque et al. \(2015\)](#). Our present study depicted that mycoplasmosis is the most common infectious disease occurred before winter season, which supports report of [Sarkar et al. \(2005\)](#).

The present study revealed that 16.67% of Sonali chickens were affected with IBD, ND and Coccidiosis infections. Prevalence of mixed infection of the disease in Sonali chicken is higher than single infection. It might be due to unhygienic environment, increase humidity, and poor litter management, which increases the susceptibility of mixed infections. A mixed infection of IBD, ND and Colibacillosis was recorded in 15.89% cases. Immunocompromised birds increase the susceptibility of mixed infection, as reported by [Toro et al. \(2006\)](#).

CONCLUSION

Prevalence of mixed infection of various diseases is common in Sonali chickens as compared to single infection. Proper housing, feeding and hygienic environment can be provided to reduce the disease prevalence of infectious diseases in Sonali chickens. Further microbiological and molecular diagnoses are suggested for detail studies.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

AUTHORS' CONTRIBUTION

MSA designed the study, interpreted the data, and drafted the manuscript. MLT was involved in collection of data and also contributed in manuscript preparation. FTZ and KMEI took part in preparing and critical checking of this manuscript.

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