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ISSN 2319-3077 Online/Electronic ISSN 0970-4973 Print

UGC Approved Journal No. 62923 MCI Validated Journal Index Copernicus International Value IC Value of Journal 82.43 Poland, Europe (2016) Journal Impact Factor: 4.275 Global Impact factor of Journal: 0.876 Scientific Journals Impact Factor: 3.285 InfoBase Impact Factor: 3.66

J. Biol. Chem. Research Volume 35 (2) 2018 Pages No. 705-710

Journal of Biological and Chemical Research

An International Peer Reviewed / Referred Journal of Life Sciences and Chemistry

Indexed, Abstracted and Cited in various International and National Scientific Databases

Published by Society for Advancement of Sciences®

J. Biol. Chem. Research. Vol. 35, No. 2: 705-710, 2018 (An International Peer Reviewed / Refereed Journal of Life Sciences and Chemistry) Ms 35/01/4002/2018 All rights reserved ISSN 2319-3077 (Online/Electronic) ISSN 0970-4973 (Print)



Prof. Dr. K. M. Islam http:// <u>www.sasjournals.com</u> http:// <u>www.jbcr.co.in</u> jbiolchemres@gmail.com

Received: 05/09/2018 Revised: 11/09/2018

REVIEW ARTICLE Accepted: 12/09/2018

Investigation on the Occurrence of Poultry Diseases at Dhaka Region of Bangladesh

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ABSTRACT

During the period of the investigation from July 2016 to June 2017, a total of 3066 samples of poultry either sick or dead were examined for diagnosis of diseases on the basis of clinical history, clinical sings, post-mortem and other laboratories examination at Central Disease Investigation Laboratory (CDIL), Dhaka, Bangladesh. Among the overall disease prevalence of viral diseases 33.02% (newcastle disease 30.30%, infectious bursal disease 1.86% and avian influenza 0.82%) followed by bacterial 24.61% (colibacillosis 10.37%, salmonellosis 7.19%, fowl cholera 6.90% and staphylococcal infection 0.13%), protozoal 15.97% (coccidiosis) and fungal 15.10% (aspergillosis 8.07% and mycoplasmosis 7.03%) diseases. On the basis of age, disease prevalence was recorded as 37.96% among the age group of >3 to 5 weeks followed by >5 weeks (36.67%), >1 to 3 weeks (18.44%) and 0 to 1 week of poultry. The overall prevalence of poultry diseases was significantly (p<0.001) higher in summer (93.76) followed by winter (89.26%) and rainy (72.99%) season. The results of the current study may help to know the prevalence of poultry diseases for the improvement of poultry production at Dhaka region of Bangladseh.

Keywords: Investigation, Occurrence, Poultry, Diseases, Dhaka, Region and Bangladesh.

INTRODUCTION

Poultry industry in Bangladesh is considered to be the fastest growing industry among the agriculture based industries. In Bangladesh there are 160 million chickens and 36 million ducks in the total poultry population and indigenous chickens constitute nearly 70% of the chicken population (DLS 2003). It plays an important role in poverty alleviation and economic development of Bangladesh. Approximately 37% of total animal protein supplied poultry meat and eggs in the country (Rahman and Rahman 1998). In Bangladesh, poultry rearing is one of the most important sources of income for rural women especially for landless and marginal farmer's (Paul et al. 1990). The poultry industry employs 5 million peoples and has experienced a long term growth rate of about 4.50%, which is highest in the economy (BLRI report 2009) of our country. Its profitable sub-sector but is seriously interrupted by a number of infectious and contagious diseases such as viral (2ewcastle disease, infectious bursal disease and avian influenza), bacterial (colibacillosis, salmonellosis, fowl cholera and staphylococcal infection), protozoal (coccidiosis) and fungal (mycoplasmosis and fungal infection) diseases.

Now a day, it is a great challenge of these harmful diseases in our country (Hossain et al. 2004). One of the major constrains of the poultry rearing is the outbreaks of several devastating diseases causing economic loss and discouraging poultry farming. Poultry farmers face a wide range of diseases, which reduce the optimal productivity of the flock. On an average 30% poultry die annually in Bangladesh due to outbreak of several diseases (Ahmed and Hamid 1992, Ali 1994). The prevalence of diseases varies depending on the geographical, climatic factors, season, breed and age of the poultry. Therefore, in this study, an attempt was made to record the prevalence of poultry diseases in Dhaka region of Bangladesh. Age related disease and seasonal influence on disease prevalence in poultry at this particular area was also determined. The results of the current study will provide an overall prevalence of poultry diseases at Dhaka region of Bangladesh. The findings may assist researchers or poultry consultants to design and implement priority based research on specific disease.

MATERIALS AND METHODS

A total of 3066 either dead or sick poultry were studied in the Central Disease Investigation Laboratory (CDIL) at Dhaka of Bangladesh. All dead or sick poultry were brought to the selected laboratory from different poultry farms located at different areas of Dhaka region to diagnose the existing diseases (Figure 1). The study was conducted during the period from July 2016 to June 2017 at the Central Disease Investigation Laboratory (CDIL), Dhaka, Bangladesh. The diagnosis of different diseases was performed on the basis of clinical history the affected flock, age of affected birds, clinical signs and symptoms, pathological findings after post-mortem examination, isolation and identification of the causal agents (Jones et al. 1996, Khan 2000).



Figure 1: Map of Bangladesh indicating the location of sampling site at Dhaka region (star mark).

For the diagnosis of bacterial diseases were primarily used to specific test kit. In some cases, isolation and identification of causal agents were incubated in McConkey agar, Sabouraud dextrose agar, blood agar and cooked meat media for growth of *Salmonella*, *E. coli*, *Aspergillus*, *Pasteurella* and *Clostridium* respectively.

J. Biol. Chem. Research 706	Vol. 35 (2): 705-710 (2018)
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The growth obtained was identified by various biochemical and sugar fermentation tests following methods described by Harrigan (1998). For the diagnosis of viral diseases, several types of serological tests were performed at the Central Disease Investigation Laboratory (CDIL). The influences of season and age on the occurrence of diseases were also analyzed. Accordingly, data were analyzed into four age groups: 0-1 week, >1 to 3 weeks, >3 to 5 weeks and >5 weekss. On the basis of environmental conditions, the year was divided into three seasons namely summer, rainy and winter. Summer season was considered from March to June, rainy season from July to October and winter was considered from November to February. The collected data were subsequently processed and analyzed by using the Microsoft Excel-2011 software to find out the prevalence of poultry diseases.

RESULTS AND DISCUSSION

The overall prevalence of different infectious diseases in poultry at Dhaka region of Bangladesh was shown in Table 1. The overall prevalence was 88.42%. The overall prevalence of poultry diseases in present study was in accordance to similarities of the earlier reports of different regions of Bangladesh (Badruzzaman et al. 2015; Rahman and Adhikary 2016). According to our investigation, prevalence of newcastle disease is higher (30.30%) followed by colibacillosis (10.38%), coccidiosis (15.96%), aspergillosis (8.07%), salmonellosis (7.19%), mycoplasmosis (7.03%), fowl cholera (6.90%), infectious bursal disease (1.86%), avian influenza (0.82%) and staphylococcus infection (0.13%).

Types	Name of diseases	No. of positive cases	Prevalence (%)
	Newcastle disease	926	30.30
Viral	Infectious bursal disease	57	1.86
	Avian influenza	26	0.82
	Colibacillosis	317	10.38
Dectorial	Salmonellosis	220	7.19
Bacteria	Fowl cholera	211	6.90
	Staphylococcus infection	04	0.13
Parasitic	Coccidiosis	488	15.96
Fungal and	Aspergillosis	247	8.07
others	Mycoplasmosis	215	7.03
	Overall	2711(3066)	88.42

Table 1. Overall prevalence of poultry diseases at Dhaka region of Bangladesh.

In our investigation, 30.30% of newcastle positive cases were found. Occurrence rate of newcastle disease in Dhaka region was higher than from Mymensingh and Sylhet where it was reported as 17.20, 10.24 and 13.84% cases of newcastle disease, (Islam et al. 1998, Talha et al. 2001 and Badruzzaman et al. 2015) respectively. The present findings would indicate that the reemergence threat of newcastle disease in commercial flocks is still increasing. In Dhaka region, poultry sector has been developing from last few years. High farm density has a great role in case of immunity breakdown of newcastle disease (Nail et al. 2005) resulting increase the newcastle disease prevalence in this area.

The results revealed that 1.86% of infectious bursal disease in Dhaka region that was significantly lower than Sylhet and Mymensingh where it was reported as 16.0, 19.16, 22 and 16.43% cases of infectious bursal disease, (Islam et al. 1998, Talha et al. 2001, Badruzzaman et al. 2015, Rahman and Adhikary 2016) respectively. Along with high prevalence of infectious bursal disease, morbidity rate of infectious disease was near about 100 % (Islam et al. 2008) but mortality was 33% (Salque 2003) to highest 80% (Islam et al. 2008, Hoque 2001). Most of the poultry farms were recorded as vaccinated with infectious bursal disease. Findings indicated that in most cases vaccination could protect the birds due to appropiate method of vaccination and properly maintain such factors are vaccine type, storage and handling, level of maternal antibody or administration of vaccine.

In this study there was 0.82% positive report of avian influenza in Dhaka region although in Gazipur, Mymensingh and Bogra areas avian influenza is a prevalent disease and it was found that in layer, broiler, native bird and duck prevalence were 12.5%, 0.0%, and 2.5%, respectively (Rahman et al. 2012).

J. Biol. Chem. Research 707 Vol. 35 (2): 705-710 (2018)	J. Biol. Chem. Research	707	Vol. 35 (2): 705-710 (2018)
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During winter season, the migratory birds came in our country and they serve as carrier of avian influenza virus. Beside the several factors such as transportation by vehicle of birds, bird crates, workers foot wear and other managemental problems are responsible for the predisposing of avian influenza. Apart from viral infection among the other diseases, it was observed that colibacillosis was 10.38%, salmonellosis was 7.19% and fowl cholera 6.90% which was the higher from other finding of 4.42, 5.56 and 0.44% (Islam et al. 2003, Giasuddin et al. 2002) respectively. Prevalence of colibacillosis in Mymensingh district was 13.12% (Talha et al. 2001) which was higher from the prevalence in Dhaka region of Bangladesh. It is due to expansion of poultry farming in Bangladesh, Colibacillosis has become a widespread problem (Islam et al. 2003, Rahman 2003 and Hossain et al. 2004). In Bangladesh prevalence of salmonellosis in layer farm is recorded as 18% (Barua et al. 2012) which is significantly higher from the overall prevalence of the present study. In this study there was 0.13% positive report of staphylococcal infection in Dhaka region although in Sylhet, Gazipur, Mymensingh and Bogra areas have no prevalent of staphylococcal infection (Talha et al. 2001, Rahman et al. 2003, Badruzzaman eta I. 2015, Rahman and Adhikary 2016). In the present study, coccidiosis is the second most important among all infectious disease of poultry which was 15.96% of the total cases of diseases. Coccidiosis is one of the important parasitic diseases that cause severe economic losses in every year and incidence of coccidiosis may vary from 7.87% (Badruzzaman et al. 2015) to 16.79% (Rahman and Adhikary 2016). The present findings would indicate that due to wet and marshy environment factors for the outbreak of coccidiosis. In the present study, 8.07 and 7.03% cases of aspergillosis and mycoplasmosis were reported in Dhaka region and in Sylhet and Mymensingh region positive cases is 4.20 and 7.20%, 11.55 and 11.66% (Talha et al. 2001 and Badrizzaman et al. 2016) respectively. Aspergillosis is the major diseases problem in broiler farming in Sylhet and Mymensingh (Rahman et al. 2003) and it was reported that in this region highly positive. This variation may be due to the cold climatic condition of that region.

s s	Age (weeks)								
ase		0-1	>	•1 to 3	>	•3 to 5		>5	
lan	No. of	Prevalence	No. of	Prevalence	No. of	Prevalence	No. of	Prevalence	
20	cases	(%)	cases	(%)	cases	(%)	cases	(%)	
Newcastle disease	-	-	57	2.10	524	19.33	345	12.73	
Infectious bursal disease	-	-	24	0.89	29	1.07	04	0.15	
Avian influenza	-	-	-	-	-	-	26	0.96	
Colibacillosis	-	-	75	2.77	131	4.83	111	4.09	
Salmonellosis	31	1.14	63	2.32	32	1.18	94	3.47	
Fowl cholera	-	-	-	-	53	1.96	158	5.83	
Staphylococcus infection	-	-	-	-	-	-	04	0.15	
Coccidiosis	-	-	163	6.01	217	8.00	108	3.98	
Aspergillosis	157	5.79	90	3.32	-	-	-	-	
Mycoplasmosis	-	-	28	1.03	43	1.59	144	5.31	
Total	188	6.94	443	18.44	1029	37.96	994	36.67	

 Table 2. Age-wise prevalence of poultry diseases at Dhaka region of Bangladesh.

The overall prevalence was highly recorded as 37.96 and 36.67% among the age group of >3 to 5 and >5 weeks followed by >1 to 3 weeks (18.44%) and then 0-1 week of poultry (Table 2). Similar observations were reported by Talha et al. 2001, Rahman et al. 2003, Badruzzaman etc al. 2015, Rahman and Adhikary 2016.

Occurrence of diseases has a significant relationship with season. In the present investigation, the result of season wise distribution and proportionate incidence of poultry diseases of Bangladesh revealed that the significantly highest in summer season (93.76%) followed by winter (89.26%) and rainy season (72.99%) (Table 3) but several previous report indicated that rainy season is the more prevalent and the least in winter for diseases (Islam et al. 2003, Nicole, et al. 2000, Mushi et al. 2008 and Rashid et al. 2013).

J. Biol. Chem. Research

708

Vol. 35 (2): 705-710 (2018)

Although, disease prevalence in winter is always comparatively lower than other season, some times this season also show highest diseases prevalence (Islam et al. 2009). Our investigation of poultry diseases, in summer season highest in viral (32.55%) followed by bacterial (28.06%), parasitic (16.65%) and fungal (16.50%) infection; in winter season highest in viral (34.58%) followed by bacterial (23.68%), fungal (16.27%) and parasitic (14.73%) infection; and in rainy season highest in viral (29.89%) followed by bacterial (17.63%), parasitic (16.86%) and fungal (8.62%) infections are the subsequently most prevalent diseases among all.

	Rainy sea	ison		Winter season		Summer season			
Name of diseases	Total cases	Positive case	Prevalence (%)	Total cases	Positive case	Prevalence (%)	Total cases	Positive case	Prevalence (%)
Bacterial		92	17.63		291	23.68		369	28.06
Viral		156	29.89		425	34.58		428	32.55
Parasitic	522	88	16.86	1229	181	14.73	1315	219	16.65
Fungal		45	8.62]	200	16.27		217	16.50
Overall		381	72.99		1097	89.26		1233	93.76

Table 3. Season-wise prevalence of poultry diseases at Dhaka region of Bangladesh.

CONCLUSION

According to the study, most prevalent of poultry diseases at Dhaka region of Bangladesh include newcastle disease (ND), infectious bursal disease (IBD), avian influenza (AI), colibacillosis, salmonellosis, aspergillosis, mycoplasmosis and coccidiosis. It was also found that >3 to 5 and >5 weeks age groups of poultry were more susceptible to various infectious diseases. Highest disease prevalence was recorded in summer season. The quality of vaccine should be kept in mind to prevent the diseases. Improved management practice and bio-security should be implemented to keep away of disease agents. The results of the current study provide an overall prevalence of poultry diseases at Dhaka region of Bangladesh. The findings may assist researchers or poultry consultants to design and implement priority based research on specific disease.

ACKNOWLEGEMENTS

The authors are very much thankful to all members of the Central Disease Investigation Laboratory (CDIL), Dhaka, Bangladesh for their cordial cooperation at the time of conducting the research work.

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Vol. 35 (2): 705-710 (2018)

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709

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J. Biol. Chem. Research

710

Vol. 35 (2): 705-710 (2018)