Research Article
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Occurrence of poultry diseases at Kishoregonj district of Bangladesh

Abstract

The study was conducted to determine the occurrence of different poultry diseases in broilers, layers and sonali chickens at Kishoregonj district in Bangladesh. A total of 1981 chickens either infected or dead were collected and examined to diagnose the diseases. Diagnosis of diseases was made on the basis of history, clinical signs, and postmortem findings and in some cases laboratory examination was performed to confirm the diseases. Overall incidence of infectious bursal disease was the highest (29.32%) in broiler chickens followed by salmonellosis (14.29%), new castle disease (11.78%), infectious bronchitis (9.27%), coccidiosis (6.93%), colibacillosis (6.43%), chronic respiratory disease (4.85%), visceral gout (4.68%), necrotic enteritis (1.59%), mycotoxicosis (0.67%) and infectious coryza (0.08%). In layer chickens prevalence of salmonellosis was higher (30.60%), followed by new castle disease (17.54%), infectious bursal disease (9.16%), coccidiosis (9.16%), chronic respiratory disease (9.16%), colibacillosis (7.01%), fowl cholera (5.26%), infectious bronchitis (4.09%), necrotic enteritis (2.92%), egg peritonitis (1.94%), aspergillosis (1.75%), deficiency disease (1.75%), mycotoxicosis (1.75%), helminth parasites (1.36%), fowl pox (0.97%), infectious coryza (0.97%) and lymphoid leukosis (0.78%). In case of Sonali Chickens infectious bursal disease was the highest (33.95%) followed by salmonellosis (27.31%), new castle disease (19.56%), chronic respiratory disease (11.07%), coccidiosis (10.70%), colibacillosis (8.11%), deficiency disease (4.80%), fowl cholera (3.32%), necrotic enteritis (2.56%), aspergillosis (2.21%), fowl pox (0.74%), helminth parasites (0.74%) and mycotoxicosis (0.37%). In this study it was observed that there was a marked influence of different seasons on the occurrence of different diseases in chickens. In conclusion diversified diseases are prevalent in broilers, layers and sonali chickens. Thus, proper vaccination and bio-security practices and preventive measures are recommended.

Keywords: poultry diseases, prevalence, chickens, kishoregonj, Bangladesh

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Introduction

Poultry farming in Bangladesh is a fast-growing sector which plays important roles in socio-economic development especially rural livelihood development by creating employment opportunities.[1] Poultry farming is currently an established business opportunity in Bangladesh. It is a very profitable business for both individuals and entrepreneurs. The economic system of our country is based on mostly agriculture and agriculture related products. Poultry products like meat and eggs are the main source of animal protein for the people of Bangladesh. Poultry enterprise has been developed rapidly in recent years. Poultry not only plays an important role in narrowing the gap between demand and supply of protein of animal origin but also provides an efficient means of income generation.[2] There is an estimated 150000 poultry farms in Bangladesh.[3] The farms annually produce 570 million tones of meat and 7.34 billion eggs.[4] Meat and eggs are two major sources of animal protein. In this country average per capita availability of meat and egg are 25.42gm/day and 13.58 gm/day against the requirement of 120 gm/day and 50 gm/day respectively. Poultry meat contributes approximately 68.17% of total animal protein supplied.[5] From last few years commercial poultry farming has been developing very rapidly but several factors reduce the growth rate of this sector and poultry diseases are the major constraints for developing the poultry industry.[6] Outbreaks of different types of diseases hamper the productivity of poultry. About 30% of poultry birds die annually in Bangladesh due to several diseases.[7,8] Production of broiler also significantly affected by diseases[9] and many of them also have public health hazards.[10,11] Kishoregonj district under Dhaka division of Bangladesh is one of the densely populated poultry zone where lots of small and medium scale farms are available. Occurrence of poultry diseases is frequent in this area. The occurrence of poultry diseases in a particular area depends on various factors like geo-climatic condition, bird's population, management practices, immunization etc. Ali8 reported about 30% mortality of chickens in Bangladesh every year due to outbreaks of several infectious diseases. Newcastle disease is an economically important infectious disease for indigenous and commercial poultry[12] whereas infectious bursal disease was reported in 1992 but morbidity and mortality also significant in this disease.[13] Among bacterial diseases salmonellosis in poultry shows more than 10% mortality and reduce egg production and hatchability for up to 20–30%.[14,15] During last few years several emerging diseases and unknown causes threat the poultry industry and causes huge loss to the farmers. For the prevention and control of the diseases in a particular area the incidence of diseases needs to be investigated. Therefore, the study was conducted.

Materials and methods

The study was conducted during the period from December 2016 to November 2017 to know the present situation of poultry diseases in commercial chickens at Kishoregonj district under Dhaka division of Bangladesh. A total of 1981 either dead or sick chickens from different

poultry farms of different Upazilla were collected to examine. Tentative diagnosis was made on the basis of clinical history, clinical signs and postmortem findings. In some cases disease diagnosis were confirmed by some laboratory examination such as isolation and identification of the causal agents, serological tests and microscopic examinations. To know the actual scenario of the disease data were recorded monthly and to study the seasonal occurrence the whole time was divided into three conventional seasons, namely Summer (March–June), Rainy (July–October) and Winter (November–February). According to species types birds were grouped as Broiler, layer and Sonali to know the species wise variations of diseases.

Results and discussion

The present study through pathological investigation detected a large number of diseases in birds in Kishoregonj district. The overall prevalence of different diseases in commercial broiler, layer and sonali birds are shown in Tables 1−3 respectively with their seasonal variation. Regardless of chicken types, the overall prevalence is shown in Table 4 with seasonal variation.

Table 1 Occurrence of diseases in broiler with seasonal variation

Name of the disease	Summer	Rainy	Winter	Total
	n=424	n=394	n=379	n=1197
ND	52(12.26%)	20(5.08%)	69(18.21%)	141(11.78%)
IBD	152(35.85%)	85(21.57%)	114(30.08%)	351(29.32%)
IB	31(7.31%)	18(4.57%)	62(16.36%)	111(09.27%)
LL				
Fowl pox				
Colibacillosis	31(7.31%)	14(3.55%)	32(8.44%)	77(6.43%)
Salmonellosis	70(16.51%)	63(16.99%)	37(9.76%0	170(14.29%)
Fowl cholera				
NE	9(2.12%)	10(2.54%)		19(01.59%)
Infectious coryza			1(0.26%)	01(00.08%)
Coocidiosis	31(7.31%)	43(10.91%)	9(2.37%)	83(06.93%)
Aspergillosis	1(0.24%)		11(2.90%)	12(01.00%)
CRD	6(1.42%)	11(2.79%)	41(10.82%)	58(04.85%)
Helminth parasites				
Egg peritonitis				
Visceral gout	1(0.24%)	43(10.91%)	12(3.17%)	56(04.68%)
Deficiency disease				
Mycotoxicosis		5(1.27%)	3(0.80%)	08(00.67%)

Table 2 Occurrence of diseases in layer chickens with seasonal variation

Name of the disease	Summer	Rainy	Winter	Total
	n=150	n=183	n=180	n=513
ND	23(15.33%)	22(12.02%)	45(25.00%)	90(17.54%)
IBD	14(9.33%)	13(7.10%)	20(11.11%)	47(9.16%)
IB	4(2.67%)	2(1.09%)	15(8.33%)	21(04.09%)
LL	2(1.33%)	2(1.09%)	-	04(0.78%)
Fowl pox	2(1.33%)	1(0.55%)	2(1.11%)	5(0.97%)
Colibacillosis	13(8.67%)	17(9.29%)	6(3.33%)	36(7.01%)
Salmonellosis	59(39.33%)	61(33.33%)	37(20.56%)	157(30.60%)
Fowl cholera	12(8.00%)	11(6.01%)	4((2.22%)	27(5.26%)
NE	8(5.33%)	6(3.28%)	1(0.56%)	15(2.92%)
Infectious coryza		1(0.55%)	4(2.22%)	5(0.97%0
Coocidiosis	12(8.00%)	21(11.48%)	14(7.78%)	47(9.16%)
Aspergillosis	1(0.67%)	2(1.09%)	6(3.33%)	9(1.75%)

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Table Continued....

Name of the disease	Summer	Rainy	Winter	Total
	n=150	n=183	n=180	n=513
CRD	5(3.33%)	6(3.28%)	36(20.00%)	47(9.16%0
Helminth parasites	1(0.67%)	5((2.73%)	1(0.56%)	7(1.36%)
Egg peritonitis	2(1.33%)	3(1.64%)	5(2.78%)	10(1.94%)
Visceral gout				
Deficiency disease	2(1.33%)	4(2.19%)	3(1.67%)	9(1.75%0
Mycotoxicosis	3(2.00%)	5(2.73%)	1(0.56%)	9(1.75%0

Table 3 Occurrence of diseases in sonali chickens with seasonal variation

Name of the disease	Summer	Rainy	Winter	Average
	n=89	n=80	n=102	n=271
ND	17(19.10%)	9(11.25%)	27(26.47%)	53(19.56%)
IBD	30(33.71%)	20(25.00%)	42(41.18%)	92(33.95%)
IB	3(3.37%)	-	6(5.88%)	9(3.32%)
LL	-			
Fowl pox	2(2.25%)			2(0.74%)
Colibacillosis	13(14.61%)	4(5.00%)	5(4.90%)	22(8.11%)
Salmonellosis	33(37.085)	23(28.75%)	18(17.65%)	74(27.31%)
Fowl cholera	4(4.49%)	2(2.50%)	3(2.91%)	9(3.32%)
NE	5(5.62%0	1(1.25%)	1(0.98%)	7(2.56%)
Infectious coryza				
Coocidiosis	15(16.85%)	10(12.50%)	4(3.92%)	29(10.70%)
Aspergillosis	2(2.25%)		4(3.92%)	6(2.21%)
CRD	8(8.99%)	5(6.25%)	17(16.67%)	30(11.07%)
Helminth parasites	1(1.12%)		1(0.98%)	2(0.74%)
Egg peritonitis				
Visceral gout				
Deficiency disease	7(7.87%)	2(2.50%)	4(3.92%)	13(4.80%)
Mycotoxicosis			1(0.98%)	1(0.37%)

Table 4 Total prevalence of diseases in commercial chickens (broiler, layer, sonali) with seasonal variations

Name of the disease	Summer	Rainy	Winter	Total
	n=663	n=657	n=661	n=1981
ND	92(13.88%)	51(7.76%)	141(21.33%)	284(14.34%)
IBD	196(29.56%)	118(17.96%)	176(26.63%)	490(24.73%)
IB	38(5.73%)	20(3.04%)	83(12.56%)	141(7.12%)
LL	2(0.30%)	2(0.30%)		04(0.20%)
Fowl pox	4(0.60%)	1(0.15%)	02(0.30%)	07(0.35%)
Colibacillosis	57(8.60%)	35(5.33%)	43(6.51%)	135(6.81%)
Salmonellosis	162(24.43%)	147(22.37%)	92(13.92%)	401(20.24%)
Fowl Cholera	16(2.41%)	13(1.99%)	7(1.06%)	36(1.82%)
NE	22(3.32%)	17(2.59%)	2(0.30%)	41(2.07%)
Infectious coryza		1(0.15%)	5(0.76%)	06(0.30%)
Coocidiosis	58(8.75%)	74(11.26%)	27(4.08%)	159(8.03%)

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Table Continued....

Name of the disease	Summer n=663	Rainy n=657	Winter n=661	Total n=1981
Aspergillosis	4(0.60%)	2(0.30%)	21(3.18%)	27(1.36%)
CRD	19(2.87%)	22(3.35%)	94(14.22%)	135(6.81%)
Helminth parasites	2(0.30%)	5(0.76%)	2(0.30%)	9(0.45%)
Egg peritonitis	2(0.30%)	3(0.46%)	5(0.76%)	10(0.50%)
Visceral gout	1(0.15%)	43(6.54%)	12(1.82%)	56(2.83%)
Deficiency disease	12(1.81%)	10(1.52%)	7(1.06%)	27(1.36%)
Mycotoxicosis	3(0.45%)	10(1.52%)	5(0.76%)	18(0.91%)

According to the results, shown in Table 1, prevalence of infectious bursal disease was the highest (29.32%) in broiler chickens followed by salmonellosis (14.29%), new castle disease (11.78%), infectious bronchitis (9.27%), coccidiosis (6.93%), colibacillosis (6.43%), chronic respiratory disease (4.85%), visceral gout (4.68%), necrotic enteritis (1.59%), mycotoxicosis (0.67%) and infectious coryza (0.08%). In layer chickens(Table 2), prevalence of salmonellosis was higher (30.60%), followed by new castle disease (17.54%), infectious bursal disease (9.16%), coccidiosis (9.16%), chronic respiratory disease (9.16%), colibacillosis (7.01%), fowl cholera (5.26%), infectious bronchitis (4.09%), necrotic enteritis (2.92%), egg peritonitis (1.94%), aspergillosis (1.75%), deficiency disease (1.75%), mycotoxicosis (1.75%), helminth parasites (1.36%), fowl pox (0.97%), infectious coryza (0.97%) and lymphoid leukosis (0.78%). In case of Sonali Chickens Table 3 shows that infectious bursal disease was the highest (33.95%) followed by salmonellosis (27.31%), new castle disease (19.56%), chronic respiratory disease (11.07%), coccidiosis (10.70%), colibacillosis (8.11%), deficiency disease (4.80%), fowl cholera (3.32%), necrotic enteritis (2.56%), aspergillosis (2.21%), fowl pox (0.74%), helminth parasites (0.74%) and mycotoxicosis (0.37%).

The present study revealed (14.34%) of ND in the study population. In case of broiler, layer and sonali chickens it was (19.56%), (17.54%), and (11.78%) respectively. These findings are supported by Islam et al.[16] and Das et al.[17] who reported (14.1%) and (19.5%) respectively. Our findings are higher than the findings of Islam et al.[18] and Rahman et al.[19] who reported (6.73%) and (4.85%) ND in chickens. The incidence of ND was also high in winter season (21.33%) then followed by summer (13.88%) and rainy season (7.76%). Our findings indicated that ND in commercial chickens especially in sonali chickens was still a threat to the poultry which might be due to geographical variation, dense poultry population, inappropriate vaccination, presence of maternal antibody, faulty storage and administration of vaccine.[20]

The present study revealed (24.73%) of IBD in Kishoregonj district that was very close to (24.26%)[18] and (22.00%).[21] In this study the incidence of IBD was higher than (10.99%),[22] (16.0%),[12] (19.16%)[23] and (16.9%)[16] cases of IBD. Das et al.[24] shows 62% cases of IBD in kishoregonj district that is very much higher than our findings. The prevalence of IBD was highest in sonali (33.95%) followed by broiler (29.32%) and commercial layer (9.16%). These findings are in agreement with the higher prevalence of IBD in sonali (37.5%) than broiler (23.94%).[16] According to seasonal variation IBD is prevalent almost all the year round but mostly prevalent in summer (29.56%) then in winter (26.63%) and rainy season (17.96%), almost similar findings also described by Choudhary et al.[25] Findings indicated that there are several factors that might trigger the disease frequency like genetic variation of the species, types and methods of vaccination, storage and administration of vaccine, maternal antibody level and environment also.

Infectious Bronchitis (IB) is mostly observed in sonali Chickens that was 7.12% then in broiler and layer that were 4.09% and 3.32% respectively. These findings are higher than the findings of 1.59% and 0.90% in broiler and layer respectively[26] and markedly higher than the findings of 0.29% in chickens[18] but MK Borah et al.[27] described a higher incidence of IB that was 9.88%. Here we observed infectious bronchitis was more prevalent in sonali chickens than broiler and layer. This variation may be due to breed variation or problems in vaccination.

In this study we found lymphoid leukosis is only prevalent in layer chicken that was 0.78% but Hui Zhang et al.[28] shows 2.75% of lymphoid leukosis in chickens in Anhui province. This variation may be due to geographical variation or variation in immunization of birds.

Among the bacterial diseases it was observed that overall prevalence of colibacillosis and salmonellosis were (6.81%) and (20.24%) respectively and the highest incidence of colibacillosis (8.11%) and salmonellosis (30.60%) was observed in sonali and commercial layer chickens. (14.03%)[21] and (13.12%)[23] cases of colibacillosis in Sylhet and Mymensingh district of Bangladesh was observed that was higher than the present observation. Giasuddin et al.[29] described a lower prevalence of colibacillosis (4.42%) in chickens. In Kishoregonj region among all bacterial diseases prevalence of Salmonellosis was highest (20.24%) which is supported by earlier reporter Barua et al.[30] that was (18%). Badruzzaman et al.[21] and Giasuddin et al.[29] described relatively lower prevalence of salmonellosis in chickens that were (12.18%) and (5.56%) respectively. By observing the seasonal variation both colibacillosis and salmonellosis is higher during summer that was (8.60%) and (24.43%) respectively and lower during winter season that was (6.51%) and (13.92%) respectively. This higher incidence of sallmonellosis and colibacillosis in Kishoregonj area might be due to unhygienic management of the farm, supply of contaminated water and feed and that has become a widespread problem.[18,19,31]

In the present study (8.03%) of cases of coccidiosis was reported which is higher than (5.51%).[23] However our results correlated with the results of Sarker[32] and Kamal.[33] In this study higher prevalence of coccidian was found in the case of sonali Chicken (10.70%), then in growing layer birds (9.16%) and in broiler 6.93%. This variation might be due to species variation and use of anticoccidial drug in case of broiler feed. In the present study (6.81%) cases of CRD was reported that was lower than (11.66%).[21] In our study the prevalence of aspergillosis was 1.36% where Islam[18] and Talha[23] reported higher prevalence of aspergillosis that were (17.53)% and (4.20%)

respectively. According to our study both CRD and aspergillosis were prevalent in winter season. Visceral gout, a relatively new condition was reported as (2.83%) positive. This condition mainly occurs in broiler that was (4.68%). Yutaka et al.[34] reported (9%) cases in late autumn and (1.3%) cases in midsummer. This might be due to fast growing meat type birds, nephrotoxicity, use of antibiotics, heavy metals, nephropathic IBV, avian nephritis virus etc.

Conclusion

In summary, it can be stated that a significant number of diseases were diagnosed where infectious bursal disease (24.73%), salmonellosis (20.24%), newcastle disease (14.34%), coccidiosis (8.03%), infectious bronchitis (7.12%), colibacillosis (6.81%) and chronic respiratory disease (6.81%) were more frequent in the study area. These diseases are highly infectious and cause mortality in chickens. It has potential of hindering the economy of the poultry industry at Kishoregonj District. So we have to pay much attention about this problem. To reduce the occurrence of viral diseases we should restrict the birds with the contact of other animals specially the local birds and migratory birds, selecting a good hatchery and following proper immunization process specially maintaining the cool chain in case of vaccination and testing specific antibody titer level at particular period of time interval. In case of bacterial diseases proper sanitation and hygiene should be maintained and specific treatment should provide for their control. The results of the current study also provide a scenario of diseases in commercial chickens at Kishoregonj district. These findings may assist researchers to further research or poultry consultants to make a strategy for the control of specific diseases.

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Conflicts of interest

Authors declare that there is no conflicts of interest.

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