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A Retrospective Analysis of Prevalence of Newcastle Disease and Infectious Bursal Disease in Poultry at Kishoreganj, Bangladesh

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Abstract

Occurrence of Newcastle Disease (ND) and Infectious Bursal Disease (IBD) were identified as the major problem for broiler and layer farming in Bangladesh. The study was undertaken to observe the occurrence of newcastle disease and infectious bursal disease in poultry farms of Kishoreganj, Bangladesh, during the period from 1st March, 2017 to 6th April, 2017 and from 5th July, 2017 to 4th August, 2017. Another purpose of this study is to observe the post mortem findings that are commonly found in case of newcastle disease and infectious bursal disease. The diseases were diagnosed on the basis of history, clinical signs and post-mortem findings. Overall 300 farms were examined during the study period. Among them the numbers of broiler and layer farms were 180 and 120 respectively. Overall occurrence of ND among 300 farms were 17.67% (n=53) and in case of IBD it is 34% (n=102). In 180 broiler farms total 8.9% (n=16) and 48.3% (n=87) broiler farms were recorded for having new castle disease and infectious bursal disease respectively and in case of 120 layer farms total 30.8% (n=37) and 12.5% (n=15) farms were recorded for having new castle disease and infectious bursal disease respectively. Strict bio- security and continued surveillance of poultry is required to minimize the outbreak of those diseases.

Keywords: Prevalence; ND; IBD; Kishoreganj; Poultry

Introduction

Meat and eggs are the two major source of animal protein, at present chicken contributes 51% of total meat production of the Bangladesh though the share of broiler is not separated. Per capital annual consumption of meat in the country is 5.9 kg which is only 7.38 kg of universal standard. The consumption of eggs annually per head in the country is against the maximum requirement of 104 eggs [1]. About 5 million people of the country are directly or indirectly related with poultry sector and. Bangladesh has experienced a silent revolution in the economy with about 4.5%growth rate of which is one of the highest of all. Outbreak of various devastating diseases (like Newcastle disease and Infectious bursal disease) is one of the major constrains of the poultry farm development which cause huge economic loss. The geo climate condition, season, age and breed of the bird have important impact on the occurrence of diseases. However, the incidence of particular disease in any area sometimes either may be negligible or may cause havoc. The knowledge about epidemiology, pathogenesis and pathology of particular disease are prerequisites in the proper diagnosis and development of controlling strategies for prevention of a disease. Among the various diagnostic procedures, necropsy is one of the most popular and quick diagnostic techniques in Bangladesh.

Materials and Methods

Study period and area

This study was conducted in Kishoreganj District of Bangladesh during the period of 1st March to 6th April, 2017 and from 5th July to 4th August, 2017.

Study population

A total of 180 commercial broilers, 120 layer farms were observed. Among them 16 broiler farms, 31 layer farms were recorded as Newcastle disease infected while 87 broiler farms, 15 layer farms were recorded as Infectious bursal disease infected were brought into District Veterinary Hospital, Kishoreganj.

Procedure of postmortem examination

Post mortem examination of the sampled birds was done following standard procedure. At first general inspection was done on dead birds for detecting any defects or abnormalities that were present externally. After that a close inspection was done regarding the state of eye, presence or absence of litter materials in the beak. Then the birds were sprinkled with water for preventing any dust. Then the abdominal cavity was opened and inspection of visceral organs was done. Then the inspection of proventriculus, gizzard, liver and intestine were done both internally and externally for detecting any sorts of lesions. The Caecal tonsil and bursa were also inspected. Overall the internal organs were viewed at a glance.

Diagnosis of diseases

The birds were examined systematically and the postmortem changes were listed in the questionnaire during necropsy. Before postmortem examination the farm owner was interviewed to collect information about the history, i.e. the time of death, the time when illness started etc. Diagnosis was done according to clinical history and postmortem findings. The lesions of ND were dehydrated and dull birds with some neurological signs, pin point hemorrhage in tip of glands of proventriculus, hemorrhagic tracheitis, Caecal tonsil hemorrhage [2]. In case of velogenic form, there were found hemorrhagic plaque on intestine. On the other hand, in IBD the lesions were hemorrhage

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on enlarged and necrosed bursa of fabricious. Pin point hemorrhage found on breast and thigh muscle [2].

Data collection and analysis

Data were collected by questionnaire. The questionnaire was developed after reviewing several published paper to gather knowledge about ND and IBD at national level. The questionnaire was administered following a 'face to face' method. Farm owners/managers who brought the birds at the hospital were interviewed to collect data at bird, flock and farm level. All data were entered into a spreadsheet program of Microsoft Excel 2010 for data summary and analysis. 95% Confidence interval (CI) was calculated by using Graph pad Quickcalcs software.

Results

The present pathological investigation detected that New castle disease and Infectious bursal diseases are mainly responsible for the morbidity and mortality of chickens in Kishoreganj Sadar area. Birds were examined for diagnosis of diseases on the basis of history, clinical signs and post-mortem findings. The occurrence of New castle disease and Infectious bursal disease in case of broiler and layer is presented in Table 1 where higher occurrence was recorded in case of IBD (34%) prior to ND (17.67%). In Table 2 this occurrence was categorized according to strain where the occurrence of ND and IBD was more in case of layer birds (30.8%) and broiler birds (48.3%) respectively. The frequency distribution of ND in case of broiler is showed in Table 3 where broiler birds from day 30 to the selling day is more susceptible (43.8%). In Table 3 it is clear that layer birds age range from 41 days to 252 days is very much susceptible (54.1%) for ND. The frequency distribution of IBD in case of broiler is showed on Table 4 where broiler birds from day 19th to day 26th are more susceptible (50.5%). In Table 4 it may be noted that layer birds age more than 26 are very much susceptible (66.6%) for having IBD. Among 300 farms total 53 and 102 farms were recorded for ND and IBD respectively.

Discussion

ND was recorded 17.67% in the study population. In case of broiler and layer it was 8.9% and 30.8%, respectively which are similar to Charlton [3]. IBD was recorded in 34% (n=102) farms of the study population. In case of broiler and layer it was 48.3% and 12.5%, respectively. Pathological investigation and prevalence of IBD was reported by Anjum [4] and Kim et al. [5] as 3.1% and 27.3%, respectively.

Among the ND affected broilers 43.8% were more than 30 days old. 68% broiler birds were not vaccinated in the study population. 62%

Total Farms (N)	Disease	Broiler (n)	Layer (n)	Total (n)	Percentage	95% CI
300	ND	16	37	53	17.67%	13.75-22.40
	IBD	87	15	102	34%	28.87-39.54

Among 180 broiler farms 16 and 87 farms were recorded for ND and IBD respectively. For 120 layer farms 37and 15 farms were recorded for ND and IBD respectively.

Table 1: Percentage of the occurrence of New castle disease and Infectious bursal disease at a glance.

Type	Total farms (N)	ND (n)	Percentage	95% CI	IBD (n)	Percentage	95% CI
Broiler	180	16	8.90%	5.46-14.04	87	48.30%	41.14-55.59
Layer	120	37	30.80%	23.25-39.60	15	12.50%	7.61-19.71

Table 2: Infection status of New castle disease and Infectious bursal disease according to bird type.

	Broiler (n=16)			Layer (n=37)		
Variable	Category	Frequency (n)	Percentage (%)	Category	Frequency (n)	Percentage (%)
Age (days)	0-15	5	31.2	0-40	4	10.8
	16-30	4	25	41-252	20	54.1
	More than 30	7	43.8	More than 252	13	35.1
Vaccination	Yes	5	31.2	Yes	34	91.8
	No	11	68.7	No	3	8.2
Flock	1	5	31.2	1	11	29.7
	2	8	50	2	13	35.1
	3	2	12.5	3	8	21.6
	5	1	6.2	4	3	8.1
Flock size (n)	0-1134	5	31.2	5	2	5.4
	1135-2400	10	62.5	0-1134	9	24.3
	More than 2400	1	6.2	1135-2400	17	45.9
Mortality (n)	0-19	4	25	More than 2400	11	29.7
	20-32	6	37.5	0-19	12	32.4
	More than 32	6	37.5	20-32	19	51.3
Mortality Rate (%)	0-2	9	56.2	More than 32	6	16.2
	More than 2	7	43.7	0-2	30	81.1
Previous exposure	Yes	6	37.5	More than 2	7	18.9
	No	10	62.5	Yes	32	86.5
Appeared to be diseased (n)	0-100	6	37.5	No	5	13.5
	More than 100	10	62.5	0-40	15	40.5

Table 3: Frequency distribution of ND in case of broiler (n=16) and layer (n=37).

	Broiler (n=87)			Layer (n=15)		
Variable	**Category**	**Frequency (n)**	**Percentage**	**Category**	**Frequency (n)**	**Percentage**
Age (days)	0-18	29	33.3	0-18	1	6.6
	19-26	44	50.5	19-26	4	26.6
	More than 26	14	16.1	More than 26	10	66.6
Vaccination	Yes	75	86.2	Yes	15	100
	No	12	13.7	No	0	0
Flock	1	10	11.4	1	2	13.3
	2	19	21.8	2	5	33.3
	3	17	19.5	3	6	40
	4	9	10.3	4	1	6.6
	5	15	17.2	5	1	6.6
	6	5	5.7	0	0	0
	7	10	11.4	0	0	0
	8	1	1.1	0	0	0
	11	1	1.1	0	0	0
Flock size (n)	0-1500	27	31	0-1500	2	13.3
	1501-3000	54	62	1501-3000	10	66.6
	More than 3000	6	6.9	More than 3000	3	20
Mortality (n)	0-15	26	32.1	0-15	6	40
	16-30	34	41.3	16-30	8	53.3
	More than 30	23	26.4	More than 30	1	6.6
Mortality Rate (%)	0-1	30	34.4	0-1	8	53.3
	1.1-2	41	47.1	1.1-2	6	40
	More than 2	16	18.3	More than 2	1	6.6
Previous exposure	Yes	69	79.3	Yes	10	66.6
	No	18	20.6	No	5	33.3
Appeared to be diseased (n)	30-50	27	31	30-50	9	60
	51-120	36	41.3	51-120	6	40
	More than 120	24	27.5	1	5	33.3

Table 4: Frequency distribution of Infectious bursal disease (IBD) in case of broiler (n=87) and layer (n=15).

birds were from medium sized farms (1135-2400 birds). 56% farms of the study area were having less than 2% mortality rate. The bird's age beyond 30 are more susceptible for having Newcastle disease up to the selling. Highest occurrence found in case of birds from local hatchery 47.3% (n=7) it includes mainly Sonali. The occurrence of ND in broiler estimated by Islam et al. [6] who recorded 6.73%, 7.9% which is slightly lower from my study value. This might be due to higher stocking density, often getting contact with local and migratory birds, not maintaining cool chain in case of vaccination of birds. We observed that highest mortality in the study area among layers due to ND were at the age between 41 to 252 days (54.1%) which is more than reported by Rahman et al. [7]. Only 3% of this study population was not vaccinated. In kishoreganj maximum of the layer farms affected with ND contained 1135 to 2400 birds (45.9%). In maximum case mortality rate was less than 2%. Previously studied the occurrence of ND in case of layer by GiasUddin et al. [8] and Islam et al., [9] was 7.50% and 6.73% respectively which is lower than my study value (30.8%). This may be due to not maintaining cool chain in vaccination of birds, improper dose of vaccine and faulty management system, uneven level of maternal antibody etc. The occurrence of Newcastle Disease in layer (30.8%) was higher in layer in comparison to broiler (8.9%).

We noted highest mortality due to IBD among the study population (broilers) at the age between 19 to 26 days 50.5% (44) and 13.7% of this population (broilers with IBD) was not vaccinated. In kishoreganj maximum of broiler farms affected with IBD contained 1501 to 3000 birds (62%). The occurrence was approximately higher to some of the previous reports evidenced by Islam et al. [9] (24.26%), Talha et al. [10] (19.16%). The occurrence estimated by Ahmed et al. [11] (11.06%) and Giasuddin et al. [8] (11.80%) which was less than to my study value. Layer birds affected with IBD were majorly belonged to the age group of more than 26 days (66.6%). Only 13.7% of these birds were vaccinated against IBD. Maximum number of layer birds affected with IBD was from farms contained 1501 to 3000 birds (66.6%). In maximum case mortality rate at layer farms having IBD outbreak was less than 2%. The occurrence of IBD in layer was recorded 4.32% which was lower than Talha et al. [10] (19.16%), Ahmed et al. [11] (11.06%) and Giasuddin et al. [8] (11.80%). Majority of the IBD infected farms in the study area were vaccinated which depicted that in maximum cases vaccination failed to protect the birds. The cause of vaccination failure might be due to improper management of cool chain, lacking of optimum maternal antibody, inexperience vaccinator, inappropriate dose and fault in management system. The occurrence of Infectious bursal disease (48.3%) was higher in broiler in comparison to layer (12.5%).

Conclusion

In summary, it can be stated that in Kishoreganj district Newcastle disease are more common in case of layer birds specially in between 41 to 252 days and Infectious Bursal Disease are more common in case of broiler specially in between 19 to 26 days. It has potential of hindering the economy of the poultry industry at Kishoreganj District. So we have to pay much attention about this problem. To reduce the occurrence of Newcastle disease and infectious bursal disease 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.

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