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SHORT COMMUNICATION

Retrospective study of commercial poultry diseases

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Özet

Islam A, Majumder S, Rahman A, Trisha AA, Amin R. Ticari kanatlı hastalıklarının retrospektif çalışması. **Eurasian J Vet Sci, 2012, 28, 2, 116-121**

Araştırmanın amacı ticari kanatlılarda farklı hastalıkların varlığını araştırmaktır. Toplam 232 kanatlı farklı yaş gruplarına ve bir yılda farklı sezonlara bölündü. Paraziter hastalıklar yumurtacı (%81.9) ve broylerlerde (%95.2) yüksek belirlendi. Yazın bakteriyel ($p<0.01$) ve paraziter ($p<0.05$) hastalıklar, yağmurlu ve kış sezonlarında yüksek gözlendi. Viral hastalıklar yumurtacılarda %25.2 oranında gözlendi. Piliç (%40.9) döneminde gözlenen viral hastalıklar, yumurtacı (%8.2) dönemden önemli ($p<0.01$) derecede faklı belirlendi. Yumurtacı dönemi nonenfeksiyöz ($p<0.01$), kannibalizm ($p<0.05$) ve yumurta ile ilgili hastalıklarının ($p<0.05$), piliç döneminden önemli oranda farklı olduğu belirlendi. Broylerlerin 8-21 günlerinde gözlenen bakteriyal hastalıkları, 0-7 günlüklerden önemli ($p<0.01$) oranda düşük belirlendi. 22-35 günlük broylerlerin viral hastalıları, 0-7 günlüklerden önemli ($p<0.01$) oranda yüksek belirlendi. Guibandha bölgesi kanatlılarında birçok enfeksiyöz ve nonenfeksiyöz hastalıklar bulunduğu ve bu hastalıların kontrolü için etkili bir aşılama ve yönetim gerektiği sonucuna varıldı.

Abstract

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The aim of this study was to explore the occurrence of different diseases among commercial chickens. A total of 232 commercial chickens were divided into different age groups and the whole year was divided into three seasons. The occurrence of parasitic diseases was the highest among layers (81.9%) and broilers (95.2%). Occurrence of bacterial diseases ($p<0.01$) and parasitic diseases ($p<0.05$) was significantly lower in summer than rainy and winter seasons. Viral diseases were observed among 25.2% layers and occurrence was significantly ($p<0.01$) higher in pullet stage (40.9%) compared to laying stage (8.2%). Occurrence of non-infectious ($p<0.01$) disease, cannibalism ($p<0.05$) and egg bound disease ($p<0.05$) was significantly higher in laying stage compared to pullet stage. Bacterial disease occurrence was significantly ($p<0.01$) lower in 8-21 days age group compared to 0-7 days age group of broilers. Occurrence of viral diseases was significantly ($p<0.01$) higher among broilers of 22-35 days age group compared to 0-7 days age group. Several infectious and noninfectious diseases are prevalent among the commercial poultry of Guibandha district which can be controlled by effective vaccination and good management practices.

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The number of commercial chicken (both layer and broiler) in the country is estimated to be about 116.47 million which grew at an annual rate of 6.49 percent during the period of 1990 to 1994 and the share of poultry on the animal protein component of human diet is estimated to be 30% in 1995. In Bangladesh, besides the backyard poultry, commercial poultry production has grown rapidly since the early 1990s in response to increased demand of protein supplies (Huque 1996). Among many constraints of poultry industry mortality of birds due to various fatal infectious and non-infectious diseases is the major one (Giasuddin et al 2002). In every year 30% chicken mortality occurs due to several diseases (Ali 1994). Saleque et al (2003) showed that commercial chickens were suffering from several diseases in which the occurrence of bacterial, viral, mycoplasmal, parasitic and non-infectious diseases were 45%, 17%, 12.4%, 4.5% and 12.4%, respectively. Though parasitic diseases are causing reduced growth and mortality (Muhairwa et al 2007), they are often neglected. Rabbi et al (2006) reported that 48.75% layers and 3.75% broilers were suffering from helminthiasis. This huge production loss due to various poultry diseases can be checked by using planned control program for which it required to know the epidemiological pattern of the disease producing agents or conditions. To do this timely and accurate diagnosis is necessary which can be done by well organized veterinary laboratories. Field Disease Investigation Laboratories (FDIL) are government organizations involved in the diagnosis of livestock diseases in different part of Bangladesh.

In this study, it was planned to explore the occurrence of different diseases in commercial poultry with seasonal dynamics and to identify the factors of developing poultry disease in the areas under the jurisdiction of Field Disease Investigation Laboratories (FDIL), Guibandha.

A total of 232 commercial chickens (layer and broiler) of different ages were examined through clinical history from owners, clinical examination and post mortem at FDIL, Guibandha during the period from July, 2005 to June, 2006. Among the examined birds 127 were layers and 105 were broilers. Chickens were divided into different age groups. Layers were divided into 2 groups such as pullet (up to 140 days) and laying stage (more than 140 days). Broilers were grouped as 0-7, 8-21, 22-35 and more than 35 days of age. Investigation period was divided into 3 seasons such as rainy (July to October), summer (March to June) and winter (November to February). The chi-square test was used to assess the significance of the associations between the occurrences of the diseases in commercial chickens. Z-test (normal test) was employed to compare the disease occurrence only for significant association. Logistic regression models were fitted to recognize the effect of season and age that significantly influences the occurrence of diseases in chickens.

Table 1. Seasonal occurrence of diseases in layer birds.

Diseases	Season					
	Summer (n=56)	Winter (n=26)	Rainy (n=45)	χ^2 test	Z test* Winter	Rainy
Bacterial diseases	8 (14.3%)	6 (23.1%)	21 (46.7%)	0.001	-0.16	-0.001
Salmonellosis	5 (8.9%)	2 (7.7%)	8 (17.8%)	0.300		
Pasteurellosis	0	3 (11.5%)	8 (17.8%)	0.006	-0.02	-0.001
Colibacillosis	3 (5.4%)	1 (3.8%)	5 (11.1%)	0.411		
Viral diseases	16 (28.6%)	7 (26.9%)	9 (20.0%)	0.599		
NCD	5 (8.9%)	4 (15.4%)	2 (4.4%)	0.286		
IBD	47 (83.9%)	23 (88.5%)	38 (84.4%)	0.858		
AL	1 (1.8%)	0	0	0.528		
Parasitic diseases	45 (80.4%)	25 (96.2%)	34 (75.6%)	0.087		
Coccidiosis	44 (78.6%)	25 (96.2%)	34 (75.6%)	0.083		
Ascaridiosis	1 (1.8%)	1 (3.8%)	0	0.449		
MC Complex	2 (3.6%)	4 (15.4%)	2 (4.4%)	0.10		
Aspergillosis	3 (5.4%)	0	0	0.143		
Non-Infectious diseases	17 (30.4%)	8 (30.8%)	4 (8.9%)	0.021	-0.488	0.004
Egg bound	14 (25.0%)	7 (26.9%)	4 (8.9%)	0.075		
Canabilism	4 (7.1%)	2 (7.7%)	0	0.177		
Fatty liver hemorrhagic disease	2 (3.6%)	0	0	0.276		

Bacterial diseases were found among 27.6% birds and the occurrence was significantly ($p<0.01$) lower in summer compared to rainy season (Table 1). In rainy season, a bird had 13.781 times more risk of being infected than that of summer season by the bacterial

Table 2. Age related occurrence of diseases in layer birds.

Diseases	Age		
	Pullet stage (n=66)	Laying stage (n=61)	χ^2 test
Bacterial diseases	20 (30.3%)	15 (24.6%)	0.472
Salmonellosis	6 (9.1%)	9 (14.8%)	0.323
Pasteurellosis	6 (9.1%)	5 (8.2%)	0.858
Colibacillosis	8 (12.1%)	1 (1.6%)	0.051
Viral diseases	27 (40.9%)	5 (8.2%)	0
NCD	7 (10.6%)	4 (6.6%)	0.416
IBD	19 (28.8%)	0	0
AL	0	1 (1.6%)	0.968
Parasitic diseases	58 (87.9%)	46 (75.4%)	0.068
Coccidiosis	57 (86.4%)	46 (75.4%)	0.115
Ascaridiosis	2 (3.0%)	0	0.511
MC Complex	4 (6.1%)	4 (6.6%)	1
Aspergillosis	1 (1.5%)	2 (3.3%)	0.945
Non-Infectious diseases	3 (4.5%)	26 (42.6%)	0
Egg bound	2 (3.0%)	23 (37.7%)	0
Canabilism	0	6 (9.8%)	0.028
Fatty liver hemorrhagic disease	1 (1.5%)	1 (1.6%)	1

diseases (Table 3). This find was in agreement with that of Islam et al (2009). Pasteurellosis was found among 8.7% layers and its occurrence was significantly higher in winter ($p<0.05$) and rainy ($p<0.01$) season compared to summer season. This finding was in agreement with that of Rimler and Glimsom (1997). In the present study, the occurrence of colibacillosis was found to be higher in rainy season which did not match with the findings of Islam et al (2003). This variation may be due to management problem in the farm where farmers cover the shed with polythene during winter and rainy seasons which lead to excess gas formation followed by stress caused the disease. In rainy season, the highest occurrence (11.1%) of colibacillosis was observed and a layer was 15.657 times more likely to be infected than that of summer season (Table 3). This finding was supported by that of Mushi et al (2008) and Nicole et al (2000). Viral diseases were found among 25.2% layers and the occurrence was insignificantly higher in summer (28.6%) season followed by winter (26.9%) and rainy (20%) season (Table 1). The occurrence of NCD (Newcastle Disease) was insignificantly higher during winter season (15.4%) compared to other two seasons. This finding was in agreement with that of Manchang et al (2004) but contradict with that of Islam et al (2003). The highest occurrence for IBD (Infectious Bursal Disease) was recorded in winter (88.5%) in this study while Islam et al (2003) found 15.60% as highest during rainy season. The occurrence of parasitic diseases (81.9%) was recorded as the highest among all the observed diseases (Table 1). Coccidiosis was found among 81.1% birds which were not supported by the findings of Ghodasara et al (1992) and Adhikari et al (2008) who reported 35.26% and 50% prevalence respectively in their study. Variation may be due to the poor management system of the study area which includes less frequent changing of the litter and providing more temperature. Non-infectious diseases were present among 22.8% birds and occurrences were significantly ($p<0.01$) higher in summer and winter season compared to rainy season which was supported by Islam et al (2003).

Bacterial diseases were diagnosed among 27.6% layer birds and occurrence was insignificantly higher among pullet stage (30.3%) compared to laying stage (24.6%) (Table 2). Similar observations were reported by Singh et al (1994). Among the bacterial diseases, the occurrence of salmonellosis was the highest in laying stage (14.8%) and this was supported by the findings of Rahman et al (2004) but contradicted with Islam et al (2003). This variation may be due to bacterial strain differences as no strain consideration undertook in the present or reference study. The occurrence of pasteurellosis and colibacillosis were highest in pullet stage (9.1% and 12.1% respectively) and similar observation was recorded by Talha et al (2001) and Islam et al (2003). Viral diseases were present among 25.2% birds and the occurrence was

Table 3. Identification of significant risk factors for diseases of layers.

Model[a]	Variable	Category	Coefficient	S. E. (b)	Wald's P	OR	95% CI
1	Season	Summer (Ref)-					
		Winter	0.754	0.545	0.167	2.125	0.730-6.186
		Rainy	2.751	1.166	0.018	15.657	1.592-154.003
2	Age	<140 days (Ref)					
		>140 days	-0.014	0.007	0.049	0.986	0.972-1.000
3	Age	<140 days (Ref)					
		>140 days	-0.036	0.013	0.004	0.965	0.941-0.989
4	Season	Summer (Ref)-					
		Winter	0.577	0.528	0.274	1.781	0.633-5.010
		Rainy	2.623	1.160	0.024	13.781	1.418-133.954
5	Age	<140 days (Ref)					
		>140 days	-0.011	0.003	0.001	0.989	0.983-0.996

[a]Model 1, 2, 3, 4 and 5 were only significant which were successively fitted for the diseases-colibacillosis, coccidiosis, egg bound, bacterial diseases, and non-infectious diseases.

Table 4. Seaonal occurrence of diseases in broilers.

	Season						
	Summer (n=31)	Winter (n=35)	Rainy (n=39)	Total (N= 105)		Z test* Winter	Rainy
Diseases					χ^2 test		
Bacterial diseases	8 (25.8%)	14 (40.0%)	8 (20.5%)	30 (28.6%)	0.116		
Salmonellosis	1 (3.2%)	0	1 (2.6%)	2 (1.9%)	0.598		
Pasteurellosis	0	1 (2.9%)	0	1 (1.0%)	0.364		
Colibacillosis	8 (25.8%)	13 (37.1%)	7 (17.9%)	28 (26.7%)	0.174		
Viral diseases	9 (29.0%)	8 (22.9%)	10 (25.6%)	27 (25.7%)	0.849		
NCD	1 (3.2%)	0	0	1 (1.0%)	0.300		
IBD	8 (25.8%)	8 (22.9%)	10 (25.6%)	26 (24.8%)	0.950		
Parasitic diseases							
Coccidiosis	27 (87.1%)	35 (100.0%)	38 (97.4%)	100 (95.2%)	0.035	-0.01	-0.05
MC Complex	0	1 (2.9%)	0	1 (1.0%)	0.364		
Aspergillosis	1 (3.2%)	0	0	1 (1.0%)	0.300		
Non-Infectious diseases							
Ascites	2 (6.5%)	5 (14.3%)	5 (12.8%)	12 (11.4%)	0.572		

*Z tests were performed for comparing the occurrences of disease of winter and rainy with that of summer.

Table 5. Age related occurrence of diseases in broilers.

	Age (days)					Z test*		
Diseases	0-7 (n=15)	8-21 (n=51)	22-35 (n=38)	>35 (n=1)	χ^2 test	8-21 days	22-35 days	>35 days
Bacterial diseases	12 (80%)	16 (31.4%)	1 (2.6%)	1 (100%)	0	-0.001		0.31
Salmonellosis	0	2 (3.9%)	0	0	0.54			
Pasteurellosis	0	1 (2%)	0	0	0.758			
Colibacillosis	12 (80%)	14 (27.5%)	1 (2.6%)	1 (100%)	0	-0.001		0.31
Viral diseases	0	6 (11.8%)	21 (55.3%)	0	0	0.08	.001	
NCD	0	0	1 (2.6%)	0	0.62			
IBD	0	6 (11.8%)	20 (52.6%)	0	0	0.08	.001	
Parasitic diseases								
Coccidiosis	13 (86.7%)	49 (96.1%)	37 (97.4%)	1 (100%)	0.40			
MC Complex	0	1 (2%)	0	0	0.76			
Aspergillosis	0	1 (2%)	0	0	0.76			
Non-infectious diseases								
Ascites	0	5 (9.8%)	7 (18.4%)	0	0.26			

significantly ($p<0.01$) higher in pullet stage (40.9%) compared to laying stage (8.2%). This find was supported by that of Usman and Diarra (2008). NCD was highest in pullet (10.6%) which was in agreement with Islam et al. (2003). IBD was present among 15% bird and its occurrence was significantly ($p<0.01$) higher in pullet stage. This finding was completely supported by many researchers (Rao et al 1990, Philip and Moitra 1993, Singh et al 1994, Prabhakaran et al 1997, Charlton et al 2000). Parasitic diseases were found among 81.9% birds and occurrence was insignificantly higher among pullet stage (87.9%) compared to laying stage (75.4%). Coccidiosis was present among 81.1% birds and a laying bird had 0.986 times less possibility of being infected by coccidiosis than that of a pullet (Table 3). This observation was supported by Adhikari et al (2008). Non-infectious diseases were observed among 22.8% birds and its occurrence was significantly ($p<0.01$) higher in laying stage compared to pullet stage. A laying bird was 0.989 times more likely of being developed non-infectious diseases than that of a pullet (Table 3). As the laying birds loss more energy and minerals due to egg production compared to pullets, the occurrence of non-infectious diseases were more among them. Cannibalism was present among 4.7% birds and its occurrence was significantly ($p<0.05$) higher in laying stage. This finding was similar with the finding of Riddel (1997). Egg bound was observed among 19.7% birds and occurrence was significantly ($p<0.01$) higher in laying stage. A laying bird had 0.965 times less possibility of being infected by egg bound disease than that of a pullet (Table 3). This finding was completely supported by Rahman and Samad (2004).

Table 6. Identification of significant risk factors for diseases of broilers.

Model[a]	Variable	Category	Coefficient	S. E. (b)	Wald's P	OR	95% CI
1	Age	0-7					
		8-21	-2.358	0.718	0.001	0.095	0.023-0.386
		22-35	-4.997	1.202	0	0.007	0.001-0.071
		35>	19.817	40192.970	1.000	403868716.079	0
2	Age	0-7					
		8-21	-2.169	0.713	0.002	0.114	0.028-0.462
		22-35	-4.997	1.202	0	0.007	0.001-0.071
		35>	19.817	40192.970	1.000	403868716.094	0

[a]Model 1 and 2 were only significant which were successively fitted for colibacillosis and bacterial disease.

Bacterial diseases were found among 28.6% broilers with insignificant highest occurrence in winter (40%) followed by summer (25.8%) and rainy (20.5%) (Table 4). Insignificant occurrence of 3 bacterial diseases was recorded such as salmonellosis (1.9%), pasteurellosis (1%) and colibacillosis (26.7%). Viral diseases were present among 25.7% birds with insignificant highest occurrence in summer (29%) followed by rainy (25.6%) and winter (22.9%). The occurrence of NCD in broiler was found only in summer. The highest occurrence of IBD was recorded in summer (25.8%) which matched with the findings of Mbuko et al (2010). The occurrence of coccidiosis was significantly ($p<0.05$) lower in summer (87.1%) compared to winter (100%) and rainy (97.4%). This finding did not match with the findings of Giasuddin et al (2002) and Islam et al (2003). Ascites was the only diagnosed non-infectious disease and its occurrence was observed among 11.4% birds and highest occurrence was recorded in winter (14.3%).

The bacterial disease occurrence was significantly ($p<0.01$) lower in 8-21 days age group compared to 0-7 days age group in broilers (Table 5). Broilers of 8-21 and 22-35 days age group were 0.144 and 0.007 times less likely of being infected by bacterial diseases respectively than those of 0-7 day's age group (Table 6). This finding was supported by that of O'Dea et al (2006). Occurrence of salmonellosis and pasteurellosis was 1.9% and 1% respectively. These two diseases were observed only among birds of 8-21 days of age which matched with the findings of Islam et al (2003). Colibacillosis was present among 26.7% birds and its occurrence was significantly ($p<0.01$) lower in 8-21 days age group compared to 0-7 days age group. Broilers of 8-21 and 22-35 days were 0.95 and 0.007 times less likely of being infected by colibacillosis respectively than those of 0-7 days age group (Table 6). This finding was in agreement with that of Charlton et al (2000) but not with Islam et al (2003). This may be due to inappropriate brooding temperature during the first week as it is very difficult to maintain 95 0F in the first week which cause stress to the chicks and makes them vulnerable to various infections. Viral diseases were present among 25.7% birds and the occurrence was significantly ($p<0.01$) higher in 22-35 days age group compared to 0-7 days age group. This observation was supported by Farooq et al (2002). IBD was present among 24.8% birds and its occurrence was significantly ($p<0.01$) higher in 22-35 days age group compared to 0-7 day's age group. This finding was completely supported by that of Charlton et al (2000). The only diagnosed parasitic disease was coccidiosis and it was observed among 95.2% broilers and was prevalent in all age groups. These finding was in agreement with Islam et al (2003).

Commercial broilers and layers of Guibanha suffer from several infectious and non-infectious diseases. Season and age were identified as factors for the development of several diseases which can be an important tool for intervention to control these diseases. Further study can be conducted to identify other predisposing factors which will assist in developing successful control and preventive measures.

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