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An Investigation on the Occurrence of Pathological Conditions Affecting Broilers in Jammu

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A B S T R A C T

The present study was carried out in the Division of Veterinary Pathology, FVSC&AH, SKUAST-J R.S Pura, Jammu, to study the occurrence and mortality patterns associated with various pathological conditions in various parts of Jammu.200 flocks were surveyed in different areas in and around Jammu. Occurrence of colibacillosis (24.16%) was maximum followed by that of infectious bursal disease (IBD) (7.13%), omphalitis (6.79%), salmonellosis (5.36%). Other pathological or disease conditions found to be occurring in Jammu region were nonspecific enteritis (4.29%), coccidiosis (2.22%), haemorrhages in proven triculus (1.67%), gout (1.44%), nephro-hepatotoxicity (1.42%), ascites (1.14), fatty liver syndrome (1.03%), caseous nodules in lungs (0.75%) and non specific liver ailments (0.50%). The maximum mortality was caused by colibacillosis (8.33%) followed by IBD (5.97%), haemorrhages in proventriculus (5.52%), omphalitis (4.54%), salmonellosis (3.66%).Nonspecific enteritis (3.36%), nonspecific liver ailments (3.03%), hepatotoxicity (2.95%), caseous nodules in lungs (2.00%), coccidiosis (1.69%), ascites (1.12%), gout (0.77%) and fatty liver syndrome (0.41%) were other major pathological conditions and diseases associated with mortality. On the basis of pathomorphological studies, bacteriological studies and parasitological examination, occurrence of various pathological conditions in broiler in Jammu was determined.

Introduction

Poultry production is an important agro-based enterprise of our country. India ranks third in broiler production in the world. Jammu and Kashmir (J&K) is a large meat consuming state, therefore, a rapidly developing broiler industry provides an excellent means for supplying quality meat and a good source of livelihood to the un-employed youth (Mehta *et al.,* 2003).Morbidity and mortality due to various poultry diseases cause great economic losses to the farmers all over the world.Changing geo-climatic conditions, improper management practices and lack of awareness regarding biosecurity measures serve as major constraints for broiler industry and generally the aetiology of outbreak of diseases remains undiagnosed.Important infectious diseases of broilers are

salmonellosis, colibacillosis, mycoplasmosis, coccidiosis, inclusion body hepatitis, New castle disease and avian influenza among others (Saif, 2008).

There is lack of documentation on various diseases and pathological conditions of broilers in Jammu, so this study was carried out to determine the occurrence of various diseases in Jammu.

Materials and Methods

Study area

The present investigation was carried out in the division of Pathology SKUAST-J R.S Pura to study the occurrence and mortality patterns of poultry diseases in various parts of Jammu. To achieve the envisaged objective of the research, a survey of 200 different poultry flocks in and around Jammu was conducted during the period July 2016 to June 2017.The study period was divided into four seasons as per Meteorological Department of India, Pune, viz., monsoon, post monsoon, winter and summer. Age wise and season wise disease occurrence and mortality pattern at the field level was determined. Occurrence of disease/pathological conditions and mortality pattern was determined as per the method described by Thrusfield (1995). Disease occurrence was calculated as per the formula given below:

Occurrence of disease =

$$\frac{\text{Total no. of morbidity + Total no. of mortality}}{\text{Total no. of birds in the flock}} \times 100$$

Mortality percentage was calculated as per the formula given below:

Mortality (%) =

$$\frac{\text{Total no. of dead birds}}{\text{Total no. of sick birds in the flock}} \times 100$$

Pathomorphological studies

Gross pathology

Representative carcasses were necropsied from the mortality in different flocks. Post-mortem examination of a total 632 birds was done. Systemic examination was carried out for the presence of any lesions in the GIT. Oesophagus, proven triculus, gizzard, pancreas, liver and intestine of dead birds were thoroughly examined and visible pathomorphological alterations were recorded.

Histopathology

After thorough gross examination, representative pieces of less than 5mm thickness from respective visceral organs, viz., oesophagus, proventriculus, gizzard, liver, intestine and pancreas were collected in 10% neutral buffered formalin solution and processed for routine H & E staining (Luna, 1968).

Bacteriological studies

Collection of tissue samples for bacterial isolation

Liver and heart blood swabs were collected from representative dead birds aseptically into sterilized petri-plates. All the samples collected were processed on the same day.

Isolation and identification of bacteria

The organisms were identified on the basis of their morphological, cultural and biochemical characteristics. The procedure for isolation and identification of bacterial culture adopted for the present work was as per Cruickshank *et al.,* (1975). The samples were inoculated in nutrient broth and kept at 37°C. After 24 hours of incubation, the culture was

transferred to MacConkey's lactose agar (MLA) kept at 37°C. After 24 hours of incubation the pure colonies were stained with Gram's stain for microscopic examination. Respective cultures were identified on the basis of standard criteria. Organisms giving pink coloured colonies on MLA were also cultured on eosin methylene blue agar (EMB). Cultures giving pale-yellow coloured colonies on MLA were also identified. All cultures were subjected to various biochemical tests.

Biochemical tests

E.coli and *Salmonella* were characterized on the basis of biochemical tests according to standard procedure described by Carter *et al.*, (1994). *E.coli* and *Salmonella* isolates were subjected to Indole test, Methyl red test, Voges Proskauer test, Citrate utilization test (IMViC pattern).

Parasitological examination

Scrapings were taken from suspected cases and examined by direct wet mount smear.

Results and Discussion

The present study was carried to study occurrence and mortality patterns of poultry diseases in various parts of Jammu. Occurrence and mortality pattern of diseases at different farms is given in Table 4.1. The cumulative strength of birds in the farms was 564,753.Necropsy was conducted on representative carcasses of 632 birds. Different diseases/pathological conditions affecting broiler population in and around Jammu were colibacillosis, omphalitis, salmonellosis, IBD, coccidiosis, haemorrhages in proven triculus, caseous nodules in lungs, hepatotoxicity, gout, ascites, internal haemorrhage, fatty liver syndrome, nonspecific enteritis and nonspecific liver ailments. In cases where haemorrhages in proven triculus were seen, occurrence of Newcastle disease/avian influenza was suspected. Likewise in cases where caseous nodules were seen, brooder pneumonia was suspected.

In our study occurrence of colibacillosis (24.16%) was maximum followed by that of IBD (7.13%), omphalitis (6.79%), salmonellosis (5.36%), nonspecific enteritis (4.29%), coccidiosis (2.22%), haemorrhages in proventriculus (1.67%), gout (1.44%), hepatotoxicity (1.42%), ascites (1.14%), fatty liver syndrome (1.03%), caseous nodules in lungs (0.75%) and non specific liver ailments (0.50%).However, Singh *et al.,* (2003) found the occurrence of omphalitis, aflatoxicosis, colibacillosis, coccidiosis, aspergillosis, IBD and gout in Punjab to be much lower at 0.44%,0.41%, 0.39%, 0.16%, 0.14%, 0.08% and 0.06%. Incidence of omphalitis, colibacillosis, IBD, necrotic enteritis, Newcastle disease and brooder pneumonia as 13.40%, 11.11%, 10.58%, 6.35%, 4.59% and 3.70%, respectively from birds in Assam was recorded by Borah *et al.,* (2017). Ahmed *et al.,* (2009) however, found the occurrence of colibacillosis IBD, omphalitis, and coccidiosis in Bangladesh to be much higher at 52.26%, 11.06%, 11.56% and 4.52%, respectively. Similarly, Islam *et al.,* (2003) in Sylhet region of Bangladesh recorded a higher occurrence of all the above mentioned diseases except that of colibacillosis which at5% was found to be less than present study. Ahmed *et al.,* (2012) reported IBD 29.37% to be the most prevalent in broilers followed by colibacillosis 18.61% and coccidiosis 17.38% in district Poonch Azad J&K.

The maximum mortality was caused by colibacillosis (8.33%) followed by IBD (5.97%), haemorrhages in proventriculus (5.52%), omphalitis (4.54%) followed salmonellosis (3.66%), non specific enteritis

(3.36%), non specific liver ailments (3.03%), hepatotoxicity (2.95%), caseous nodules in lungs (2.00%), coccidiosis (1.69%), ascites (1.12%), gout (0.77%) and fatty liver syndrome (0.41%).Similarly, Itoo *et al.*, (2013) recorded occurrence of colibacillosis, Newcastle disease, aspergillosis, gout and ascites with respective mortalities of 6.4%, 13.7%, 7.0%, 8.7% and 9.3% in and around Srinagar. However, Singh *et al.*, (1998) reported that maximum mortality was caused by omphalitis (1.29%) followed by IBD (0.86%), coccidiosis (0.56%), colibacillosis (0.32%) and fowl typhoid (0.23%) in Punjab. Mahajan *et al.*, (1994) in Hisar, observed that the maximum mortality was caused by fowl typhoid 10.54% followed by colibacillosis 8.88%, miscellaneous diseases like gout, ascites (8.05%), brooder pneumonia (7.69%), coccidiosis (6.85%) and Newcastle disease (6.03%).

Table.1 A summary of occurrence and mortality pattern of diseases at 200 different farms surveyed

S. No.	Confirmed and suspected pathological conditions	Total no. of flocks	Total number of birds	Total number of morbid birds (app.)	Total number of dead birds	Occurrence (%)	Mortality (%)
1.	Colibacillosis	82	180753	126000	10500	24.16	8.33
2.	Omphalitis	17	53900	36685	1666	6.79	4.54
3.	Salmonellosis	24	50600	29250	1071	5.36	3.66
4.	IBD	22	44800	38000	2272	7.13	5.97
5.	Coccidiosis	06	21600	12380	210	2.22	1.69
6.	Haemorrhages in proventriculus	03	11500	8980	496	1.67	5.52
7.	Caseous nodules in lungs	03	11000	4200	84	0.75	2.00
8.	Hepatotoxicity	06	13000	7830	231	1.42	2.95
9.	Gout	05	24500	8100	63	1.44	0.77
10.	Ascites	07	17200	6400	72	1.14	1.12
11.	Non specific enteritis	16	35600	23485	791	4.29	3.36
12.	Fatty liver syndrome	04	42500	5800	24	1.03	0.41
13.	Non specific liver ailments	02	4700	2765	84	0.50	3.03
14.	Internal haemorrhage	03	36400	-	05	-	-
	Total	20	564753	309875	17569	57.98	5.66

Table.2 Age wise distribution of disease conditions

Sr. No.	Age of birds (weeks)	Pathological conditions
1.	0-1	Omphalitis (*E.coli and Salmonella*) and salmonellosis
2.	1-2	Colibacillosis, omphalitis, salmonellosis, caseous nodules in lungs, gout and non specific enteritis.
3.	2-3	Colibacillosis, salmonellosis, haemorrhages in proventriculus, ascites, gout, internal haemorrhage, fatty liver syndrome, non specificproventriculitis and enteritis.
4.	3-4	Ascites, colibacillosis, IBD, coccidiosis, Hepatotoxicity, fatty liver syndrome, non specific liver ailmentsandnon specific enteritis.
5.	4-5	Colibacillosis, IBD, Hepatotoxicity andnonspecificenteritis.

Buragohainand Kalita (2010) observed that ascites syndrome (34.3%) was main cause of mortality followed by colibacillosis (19.23%), omphalitis (12.18%) and caecal coccidiosis (8.33%) in Mizoram. Lalrintlunga and Baruah (1993) from Assam reported that highest mortality was due to Newcastle disease (25.9%), coccidiosis (15.7%), colisepticaemia (14.6%), aflatoxicosis (10.5%) and omphalitis (5.8%). Anjaneyulu *et al.*, (1998) reported that colisepticaemia (13.4%) followed by IBD (9.1%), coccidiosis (7.0%) and ascites (6.78%) were the major causes of mortality in broilers in Prakasam district of Andhra Pardesh.

Pugashetti and Shivakumar (2007) observed that maximum deaths in broiler birds in an organised poultry farm of Karnataka were caused by pneumonia (29.60%), enteritis (27.73%), ascites (7.22%) and coccidiosis (2.51%). Reddy and Reddy (1991) observed the mortality pattern in broilers was maximum due to coccidiosis (21.51%) followed by Newcastle disease (11.8%) and enteritis (1.95%). However, Ahmed *et al.*, (2009) reported that highest mortality was due to colibacillosis (52.26%) followed by omphalitis (11.56%), IBD (11.06%), coccidiosis (4.52%), mixed infection of IBD and coccidiosis (1.51%) and salmonellosis (1.01%) at Kapasia in Gazipur district.

Disease conditions recorded in different age groups is given in Table 4.2.In birds 0-1 week of age, the pathological conditions recorded were omphalitis and salmonellosis. colibacillosis, omphalitis, salmonellosis, caseous nodules in lungs, gout and non specific enteritis were seen in birds of 1-2 weeks of age. However, colibacillosis, salmonellosis, haemorrhages in proventriculus, ascites, gout, internal haemorrhage, fatty liver syndrome, proventriculitis, gizzard erosions and nonspecific enteritis were major conditions observed in 2-3 weeks old birds. Birds in 3-4 weeks of age were found to be affected with ascites, colibacillosis, coccidiosis, IBD, hepatotoxicity, fatty liver syndrome, non specific liver ailments, non specific enteritis whereas 4-5 week old birds were found to be affected with colibacillosis, IBD, hepatotoxicity andnon specificenteritis (Table 4.2).

In conclusion, colibacillosis was most common disease in broiler chickens affecting all age groups and prevalent in all seasons with an occurrence of 24.16% and caused 8.33% mortality. Other diseases or pathological conditions affecting the broilers were IBD, omphalitis, salmonellosis, nonspecific enteritis, coccidiosis, haemorrhages in proventriculus (NCD/Avian influenza suspected), gout, nephro-

hepatotoxicity, ascites, fatty liver syndrome, presence of caseous nodules in lungs and non specific liver ailments. Implementations of better managemental practices are recommended to minimize disease occurrence and the consequent economic losses due to morbidity and mortality in broiler birds. The information generated in present study should serve as base line data for future studies to determine molecular prevalence of various diseases in broilers of Jammu.

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