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Original Article

A study on the prevalence of respiratory diseases in broiler and layer flocks in and around Lahore district

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Abstract

The present study was designed to record prevalence of respiratory diseases in broiler and layer flocks in District, Lahore Pakistan during the period July, 2011 to June, 2012. Out of 220 broiler flocks, 72, 47 and 26 were found affected with infectious coryza, colibacillosis and CRD, respectively. The prevalence of infectious coryza, colibacillosis and CRD were found to be 32.72% 21.36% and 11.81% respectively. Out of 109 layer flocks, 68, 18 and 23 were found affected with infectious coryza, collibacillosis and CRD, respectively. The prevalence of infectious coryza, colibacillosis and CRD in layer was found to be 29-35%, 10.11% and 12.84% respectively. The respiratory diseases were recorded throughout the year, however, occurrence was more prevalent in winter season. During the study a total of 172 samples (liver, heart & lungs) were cultured out of which 78 were positive for *E.coli* isolates. The antibiotics lincomycin, norfloxacin and neomycin showed best efficacy against *E.coli* infections, whereas oxytetracyclin, doxycyclin, colistin showed least zones of growth inhibition.

Keywords: Prevalence, respiratory diseases, poultry.

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INTRODUCTION

The poultry sector has long recognized importance of health management to get the most out of the birds' genetic potential. Since the avian respiratory system has little spare capacity and its gas exchange and thermoregulation functions are so critical that to achieve the expected performance, managing respiratory disease is of prime importance. In recent years respiratory diseases are probably the main hazards to the industry causing considerable economic losses. *Mycoplasma gallisepticum* is the major cause of chronic respiratory disease and economically causes more losses as compared to other Mycoplasma species. Birds of all ages are susptible to this disease but young birds are more prone to the infection than adults (Hossain *et al.,* 2010). The disease was more prevalent in winter season in comparison with the summer. The higher prevalence rate has been recorded in flock having high birds density compared to those with lower one (Islam *et al.,*2011; Mukhtar *et al.,* 2012). Incidence of the respiratory diseases (coryza, CRD, colibacillosis, I.B, pneumonia) was higher in broiler than layer (Younus*et al.,* 2008; Balasubramaniam and Dorairajan, 2009) CRD is characterized by respiratory distress, open month breathing caughing, sneezing with nasal discharge, torticollis, reflect feathers, uneven growth, diarrhea, swollen heads and drop in egg production with varying rates of morbidity (Hasan *et al.,* 2002; Ahmad *et al.,* 2008; Islam *et al.,* 2011). Mortality rates due to CRD in layer flocks have been reported to range from 1.11-5.59% (Babiker *et al.,* 2009; Mzuddin *et al.,* 2011). Infectious coryza (IC) is an infectious contagious respiratory bacterial disease of chicken caused by *Haemophilus paragallinarum*, which affects primarily the nasal passages and air sacs but not the trachea. (Jurgen *et al.,* 2001; Gayatri *et al.,* 2009). The mortality rate due to IC has been documented upto 0.41% (Mzuddin *et al.,* 2011). Collibacillosis is an acute septic-cemic disease of intensively raised birds caused by the bacterium *Escherichia coli*. Most commonly young birds

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between the age of 4-12 weeks are affected. Initially they show reduced feed intake, ruffled feathers, respiratory distress and will evenly die. Postmortem findings show fibrinous pericarditis, air sacculitis, tracheitis, salpingitis and enteritis (Jurgen *et al.,* 2001). The present study was designed to know the prevalence of different respiratory diseases in broiler and layer flocks maintained in and around Lahore. It is hoped that the information presented will help in formulating monitory program in poultry industry.

MATERIALS AND METHODS

Seasonal dynamic of respiratory diseases in broiler and layer flocks was explored in and around Lahore. The study was conducted at Poultry Disease Diagnostic Laboratory, of Deputy District Livestock Officer (PP), Lahore. For this purpose, samples were collected from followings sources.

1. Commercial broiler & Layer farms.
2. Birds received in laboratory for disease diagnosis.

Detailed history of the flock regarding No. of birds, age, capacity of farm, management of farm, vaccination schedule, feed and medicine used and mortality were recorded. Postmortem of the sick/dead birds were conducted for the purpose of disease diagnosis and gross pathological lesions were recorded. The prevalence of respiratory diseases were recorded and information thus collected was used to draw inference. Antibiotic sensitivity test was also conducted in complex cases of respiratory diseases to reduce the cost of medication.

RESULTS AND DISCUSSION

Results of the present study are presented in table I, II and III. Average flock size in broiler and layer was 8000 and 6000 respectively. The results revealed that out of 220 broiler flocks affected with different disease problem 72, 47 and 26 were affected with infectious coryza, colibacillosis and CRD (chronic respiratory disease), respectively. The prevalence of infectious coryza, colibacillosis and CRD were found to be 32.72, 21.36 and 11.81%, respectively (Table I). The results of the present study revealed that out of 109 layer flocks 68, 18 and 23 were affected with infectious coryza, colibacillosis and CRD, respectively. The prevalences of infectious coryza, colibacillosis and CRD in layer were found to be 29.33, 10.11 and 12.84%, respectively (Table II).

During the present study prevalence of infectious coryza in broiler was high during winter (40.00%) followed by autumn (34.28%) and spring (29.62%) and lowest during summer (16.66%). The reasons for such a high occurrence of the disease seem to be poor, management practices such as fluctuation of temperature during winter and increased concentrations of ammonia gas due to poor ventilation. Our findings are not in line with the findings of Younus *et al.* (2008) as they reported prevalences of infectious coryza, colibacillosis and CRD in broiler flock were 16.8%, 12.5 % and 11.5%, respectively. During the present study, overall prevalence of infectious coryza in layer was 29.35%. Prevalence of infections coryza in layer was highest during winter (35.29%) followed by autumn (32%) and spring (31.57%) and lowest in summer (19.35%). During present study, infectious coryza was mostly seen in broiler of age group of 3-6 weeks of age. Similar findings were reported by Younus *et al.* (2008), that the incidence of respiratory diseases increased with increase in age.

In our study, overall prevalence of colibacillosis in broiler flocks was 21.36% being higher during summer (25%) followed by spring (22.22%), winter (21.05%) and autumn (17.14%). The reason for such a high occurrence of the disease seems to be poor management practices. Our findings are not in line with findings of Younus*et al.* (2008) who reported that prevalence of colibacillosis was 12.5 %. In our study, *E. coli* infection was mostly seen in broiler of age group 4-8 weeks age. The colibacillosis (18.03%) was most prevalent during winter and autumn. Javed *et al.* (1991) reported that prevalence of *E. coli* was higher in broiler (13.13%) compared with layers (11.74%) and demonstrated that *E. coli* isolates were sensitive to gentamycin, ampicillin and neomycin, Gordan and Jorden (1982) reported that large No. of *E. coli* normally present in the intestines of all animals including man but relatively few of them are pathogenic and in case of poultry only 10-15% of the intestinal coliforms have been found to do so.

Table I: Season wise prevalence of respiratory diseases in Layer flocks in and around Lahore.

Season	Flock examined (n)	Infectious coryza	% age prevalence	Coliba-cillosis	% age prevalence	CRD	% age prevalence
Summer	36	6	16.66	9	25	3	8.33
Autumn	35	12	34.28	6	17.14	3	8.57
Winter	95	38	40.00	20	21.05	12	12.63
Spring	54	16	29.62	12	22.22	8	14.81
Total	220	72	32.72	47	21.36	26	11.81

Summer (May-July); Autumn (Aug. Oct.); Winter (Nov. Jan.); Spring (Feb-April).

Table II: Season wise prevalence of respiratory diseases in Layer flocks in and around Lahore.

Season	Flock examined (n)	Infectious coryza	% age prevalence	Coliba-cillosis	% age prevalence	CRD	% age prevalence
Summer	31	6	19.35	3	9.67	3	9.67
Autumn	25	8	32.00	2	8.00	2	8.00
Winter	34	12	35.29	4	11.76	6	17.64
Spring	19	6	31.57	2	10.52	3	15.78
Total	**109**	**32**	**29.35**	**11**	**10.09**	**14**	**12.84**

Summer (May-July); Autumn (Aug. Oct.); Winter (Nov. Jan.); Spring (Feb-April).

In the present study, high incidence of *E.coli* infection was observed as a result of unhygienic conditions present at most of poultry farms and hatcheries, poor brooding management and supply of contaminated water at majority of the poultry farms.

Table III: Samples cultured for *E.coli* isolates.

Period	Total samples cultured	Positive	Negative
Jul.- Sep.,2011	34	12	22
Oct- Dec., 2011	65	32	33
Jan.- Mar., 2011	37	19	18
April -June, 2011	36	15	21
Total	**172**	**78**	**94**

Overall prevalence of colibacillosis in layer was 10.09%. Prevalence of *E.coli* infection was the highest during winter (11.76%) followed by spring (10.52%) summer (9.61%) and autumn (8.00%).

Table IV: Antibiotic sensitivity test against *E.coli* isolates.

Antibiotic	Result	Antibiotic	Result
Lincomycin	+ + +	Colistin	+
Norfloxacin	+ + +	Neomycin	+ +
Enrofloxacin	+ +	Doxycyclin	+
Chloramphenicol	+ +	Oxytetracyclin	+

Our findings are similar with those of Javed *et al.* (1991) who reported the prevalence of *E.coli* infection in layer of 11.74%. Younus *et at.* (2009) reported that in broilers, the incidences of *E.coli* infections and coryza were equally distributed in all the months, but more

than half of the total chronic respiratory disease (CRD) cases were seen during April to June and in layer, half of the coryza and one third of CRD outbreaks were encountered in April–June. Similar findings have been reported by Javaid*et al.* (2003) who have investigated that there was a higher incidence of *E.coli* infection in group A (1-4 weeks) followed by groups B (4-8 weeks). During the present study the higher prevalence of CRD (11.81%) observed in broiler in spring and winter may be due to sudden change in climate.

Chronic respiratory disease complex had devastating effects on birds leading to heavy economic loses to the farmer caused by heavy mortality, low weight gain and poor feed conversion ratio. Our findings are similar with findings of Rehman and Samad (2003) who reported prevalence of avian mycoplasmosis (13.65%) in chicken. During present study, the overall prevalence of CRD in layer was 12.84%. The prevalence of CRD in layer was observed to be more in winter (17.64%) followed by spring (15.78%) summer (9.67%) and autumn (8.00%). Mukhtar *et al.* (2012) concluded that the disease was prevalent in winter season in comparison with summer in layer. Our findings are not similar with findings of Abu Baker *et al.* (2012) who reported that in sero-positive flock maximum isolates recovered belonged to MG (39.6%), *E.coli* (24.4%). *Mycoplasma gallisepticum* and *M. synoviae* are considered as significant poultry pathogens which cause heavy economic losses all over the world (Kleven, 2008). In our study, the most frequent sign and symptoms of respiratory distress recorded at the farms included, sneezing, coughing, nasal discharge, tracheal rales. Severity of the disease is greatly affected by the environmental conditions and mycoplasma species involved and other pathogens of respiratory tract infection. Mild or sub clinical disease may be observed with simple MG involvement or in combination of MS, while severity of the diseases increases with the involvement of other pathogens. In the present study other factors which may promote the respiratory distress cases includes poor samitation, overcrowding and poor management. Similar findings have been documented by (Chanie *et al.,* 2009).

Higher MG prevalence rate (48.11%) was recorded in flocks having high birds density. Similarly Islam *et al.* (2011) reported that prevalence of *Mycoplasma gallisepticum* was 44% in broiler. They found that involvement of MG in respiratory problem is very high in winter season. Likewise, Haghighi-khoshkhoo *et at.* (2011) reported that prevalence of MG in layer was 10% whereas sero prevalence of MS was 42.5%.

A total of 172 samples (liver, heart and lungs) were cultured. Out of which 78 samples were positive for *E.coli* isolates as detailed in table-III. Table IV illustrates antibiotic sensitivity discs results. The different antibiotic discs used in this study were lincomycinnorfloxacin, enrofloxacin chloramphenicol, neomycin, doxycyclin, oxytetracyclin and colistin. It can be seen that lincomycin, norfloxacin and neomycin showed the best efficacy against *E.coli* infection, whereas oxytetracyclindoxycyclin, colistin expressed weak zones of growth inhibition.

Recommendations

- Provide good hygienic and management conditions in farms
- Birds should be provided well balance nutritive food
- Strict bio-security measured should be designed to reduce the exposures to pathogens originating from breeders, hatchery, feed, water and environment.
- It would be beneficial for farmers to medicate their flocks after getting the culture sensitivity reports from the laboratory. In this way they can reduce their cost of medication and can have better results of antibiotic(s) administration.

REFERENCES

ABU BAKER, S., REHMAN, S., HUSSAIN, I. AND MUHAMMAD, G., 2012. Frequency distribution of opportunistic avian pathogens in respiratory distress case of poultry. *Pakistan Vet. J.,***32**:386-389.

AHMAD, A, ATIF, H., AKBAR, S., NAJEEB, M.I. AND AHMAD, M.D., 2008. Study of disease outbreak in layer flock in and around. Sammundri area. *Pakistan J. Life Soc. Sci.,***6**: 59-62.

BABIKER, M.A., TAWFEIG, I.E., YAHIA AND NOURA, K., 2009. Mortality and disease status in layer chicken flocks reared in traditional farms in Khartoum-Sudan. *Int. J. Poult. Sci.,***8**: 264-269.

CHANIE, M., TNEGASH, AND TILAHUM, S.B., 2009, Occurrence of concurrent infectious diseases in broiler chickens is a threat to commercial poultry farms in central Ethiopia. *Trop. Ani. Heal Prod.,***41**: 1309-1317

GAYATRI, R., ROY, A. AND YADAV, M.M., 2009. An overview on epidemiologic investigations of infectious coryza. *Veterinary world,***2**: 401-403.

HAGHIGHI KHOSHKHOO, P., KBARIAZAD, G.A., ROOHI, M., INAMLO, J., MASOUMI, M. AND YOUSEFI, P.S., 2011. Seroprevalence of *Mycoplasma galliseptium* and *Mycoplamasynoviae* infection in commercial layer flocks of the center north of Iran. *Afr. J. Microbiol. Res.,***5**: 2834-2837.

HOSSAIN, K.M.M., HOSSAIN, M.D.T., YAMATO, 2010. Sero-prevalence of *salmonella* and *Mycoplasma gallisepticum*infection in chickens in Rajshahi and surrounding district of Bangladesh. *Int. J. Biol.*, **2:** 74-80.

HASAN S., K., AHMAD, N., FAWAD, B., SIDDIQUE AND REHMAN, H., 2002. Current respiratory disease problem and the probes in chicken. *Pakistan Vet. J.,***22**: 17-20.

ISLAM A., ASLAM, A., CHAUDHARY, Z.I., AHMAD, M.U., REHMAN, H.U., SAEED, K. AND AHMAD, I., 2011. Pathology of*Mycoplasmagallisepticum* in naturally infected broilers and its diagnosis through PCR. *Int. Agric. Biol.,***13**: 835-837.

JAVED, M.T., ANJUM, R., KHAN, M.Z. AND KHAN, A., 1991. Studies of the isolation, pathogenecity and sensitivity of *Escherichia coli* in layer and broilers. *Pakistan Vet. J.,***11**:187-190.

JURGEN, E., AULENDORF AND JURGEN LOHR, 2001. Respiratory diseases in chicken of non-viral origin. *Wold Poultry,***17**: 40-45.

KLEVEN, S.H, 2008. Control of avian mycoplasma infections in commercial poultry, *Avian Dis.,***52**:367-374

MUKHTAR M., AWAIS, M.M., ANWAR, M.I., HUSSAIN, Z., BHATTI, N., ALI, S., 2012. Sero prevalence of *Mycoplasma gallisepticum* among commercial layer in Fasilabad, Pakistan. *J. Basic Applied Sci.,***8**: 183-186.

MZUDDIN, M.A., SAMAD, S.M.L. AND KABIR, 2011. Mortality and disease status in Hyline and ISA bown strains of layer chicken reared in cage system in Bangladesh. *Bangl. J. Vet. Med.,***9**: 1-16.

REHMAN, M.A. AND SAMAD, M.A., 2003. Pattern of occurrence of single and concurrent diseases associated with mortality in commercial chickens in Bangladesh. *Bangl. J. Vet. Med.*, **1**(1): 15-20.

YOUNUS, A.W., NASIR, M.K. FAROOQ, V. AND BHUM, J., 2008. Prevalence of poultry diseases and their interaction with mycotoxicosis in District Chakwal: effects of age and flock size *J. Anim. PI. Sci.,***18**(4):107-113.

YOUNUS A.W., NASIR, M.K., AZIZ, T. AND BOHIM, J., 2009. Prevalence of poultry diseases and their interaction with mycotoxicosis: effects of season and feed. *J. Ani. PI. Sci.,***19**(1):1-5

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