layer (Fig. 2). These vacuoles may be expanded endoplasmic reticulum of granulosa cells or absorbed vacuoles (Hasanzadeh and Sadeghinejad, 2012). Also, many apoptotic bodies were only seen in granulosa cell layer during summer season (Fig. 3), thus indicating follicular atresia. The accelerated rate of follicular atresia is one of the major causes for the reproductive failure in buffalo during summer season (Rajesha et al., 2001).

Summary
Season has a visible influence (p<0.05) on the number of follicles on ovarian surface, oocyte recovery rate and oocyte quality in buffalo. The pathological microscopic changes observed in follicles during summer were absent during winter season.

References


Prevalence and Pathological Studies on Mixed Infection of E. coli and Salmonella in Broiler Birds with Special Reference to Pneumoenteric Lesions*

S.S. Manjunatha1 and D.T. Naik
Department of Veterinary Pathology, Veterinary College, Nandinagar, Bidar, Karnataka – 585401.

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Abstract
Pneumoenteric lesions of Colisalmonellosis in poultry cause high mortality and morbidity with resultant production failure. In the present study, 500 samples were collected from broilers. 106 samples revealed bacterial causes for pneumonia and 22.7 per cent of the pneumatic lesions were found to be mixed infection of E.coli and Salmonella. 60 samples indicated bacterial enteritis and 30.77 per cent of enteric lesions were found to be mixed infection of E.coli and Salmonella. The gross changes mainly included fibrinous pericarditis, perihepatitis, pneumonia and retention of yolk and histopathological findings revealed interstitial pneumonia and catarrhal enteritis.

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1Corresponding author : Email : drssmanjunatha@gmail.com
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Pneumoenteric infections in broilers are of prime importance. Among them *E. coli* and *Salmonella* organisms play a vital role in bringing about pneumoenteric lesions. Paranjape and Das (1985) studied the prevalence of bacterial infections and reported mixed infections of *E. coli* and *Salmonella* species in 4.2 per cent of birds. The extent of their prevalence and pathological studies with special reference to pneumoenteric lesions in different parts of the country inclusive of Karnataka State has not been systematically carried out. Hence, the present study was undertaken to throw light on Colisalmonellosis prevailing in poultry broiler birds.

Materials and Methods

The samples were collected from the broiler birds which were brought for post mortem examination to the Department of Veterinary Pathology, Veterinary College, Bidar and from different slaughter houses of Bidar district, a part of North Karnataka were used for this study. A total of 500 samples were collected from broiler birds. A detailed post mortem examination was conducted and gross lesions if any, were recorded.

For histopathological study representative samples of lungs, trachea and intestines were collected and preserved in 10% Neutral Buffered Formalin (NBF). Paraffin embedded tissues were cut into 5 micron thickness and tissue sections were stained with Haematoxylin & Eosin as per the routine procedure. Bancroft and Gamble (2008).

Results and Discussion

The recorded proportional disease specific prevalence rate of mixed infection of *E. coli* and *Salmonella* were found to be 22.7 per cent causing pneumonic lesions and 30.77 per cent causing enteric lesions. However, the prevalence recorded by Paranjape and Das (1985) was lower.
(4.2 %). The higher prevalence rate recorded in the present study might be due to the *Salmonella* infected parent flocks transmitting disease to chicks vertically and further unhygienic condition favoring *E.coli* to act as the secondary pathogen resulting in mixed infection.

The gross changes mainly included fibrinous pericarditis, perihepatitis, pneumonia and retention of yolk (Fig 1 & 2). *E.coli* and *Salmonella* organisms were isolated from the lung samples and yolk sac material respectively. Typical metallic sheen color was noticed on the Eosine Methylene Blue (EMB) agar confirming the presence of *E.coli* and black color pigmentation was noticed on the *Salmonella Shigella* agar confirming the presence of *Salmonella* organisms. These findings are in accordance with the earlier observations. Saif *et al*. (2008)

The histopathological findings in the lungs consisted of mild to severe congestion, multifocal haemorrhages, perivascular and interstitial oedema (Fig. 3), lymphoid cell accumulation at sub mucosa of the bronchi and at interstitium along with the perivascular infiltration of the inflammatory cells mainly consisting of mononuclear cells. Foci of exudates consisting of mononuclear cells and erythrocytes were found in the secondary and tertiary bronchioles. Talha *et al*. (2001) and Saif *et al*. (loc. cit) recorded similar findings in *Salmonella* and *E.coli* infection.

Grossly, the intestinal mucosa was congested. In many of the cases, excess catarrh was found in the lumen of the small intestine and haemorrhages were the feature in some. Retained yolk was seen more consistently. These findings are similar to the observations made by Islam *et al*. (2003).

Microscopically, moderate congestion, multifocal haemorrhages, destruction of the villi and desquamation of the epithelial cells along with the cellular infiltration mainly consisting of lymphocytes were found at the mucosal region of the intestine (Figure. 4). Mild to moderate degree of crypt epithelial hyperplasia and increased goblet cell activity was seen.

**Summary**

In the present study, mixed infection of *Eschericia coli* and *Salmonella* was identified to be a major finding in causing both pneumonic and enteric lesions which was noticed in 52 cases out of 500. It revealed that 22.7 per cent of the pneumonic lesions and 30.77 per cent of enteric lesions are due to the mixed infection of *Eschericia coli* and *Salmonella* respectively leading to the major loss to the broiler industry. Hence due care has to be taken to curtail these organisms.

**References**


