STUDY ON POST MORTEM INCIDENCE AND PATHOLOGY OF COLISEPTICEMIA OF YOUNG BROILER CHICKS IN ODISHA

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ABSTRACT

Post mortem on 4771 chicks within the age group of one to three weeks formed the basis of this study. The disease conditions were categorized as omphalitis, colibacillosis, enteritis, debility, salmonellosis, coccidiosis, gout, aspergillosis, hepatitis, nephritis, pneumonia, and IBD. The highest post mortem cases were of colibacillosis; of which omphalitis was 20.4% followed by colicepticemia (17.6%) and enteritis (10.5%). Out of total bacterial isolates 72% were positive for *Escherichia coli* and rest 25 to 30% isolates were belonged to the genera *Proteus, Salmonella, Pseudomonas, Staphylococcus, Streptococcus, Klebsiella* and *Enterobacter.* E. coli *was* serotyped as O1, O119 and O57. On antibiotic sensitive test these were found to be highly sensitive to Ciprofloxacin, Norfloxacin, Chloramphenicol and Furazolidone.

KEY WORDS : Mortality; Colisepticaemia; *Escherichia coli*; Omphalitis; Serotype;

INTRODUCTION

The available literature on early chick mortality is quite meagre in India. The present study is intended to explicate the factors that are associated with post hatchery losses in chicks up to three weeks of age. An insight into the mortality pattern in nascent chicks will go a long way in protecting the initial loss. As the aetiological agents and the pattern of early chick mortality appear to have a regional predisposition depending on agro-climatic and socioeconomic condition, the proposed study is hoped to partially fulfil the requirement of the poultry farmers of Odisha.

MATERIALS AND METHODS

This study was based on the information garnered from the necropsies conducted at Pathology Department, Odisha Veterinary College, Bhubaneswar. Necropsy of 4771 broiler chicks up to 3 weeks of age during the period 2006-2009 formed the basis of the study. The chicks mostly belonged to the Government owned poultry farms and several private organised units from different parts of Odisha. All the data were categorised into different subgroups to determine the influence or predisposition of season, age, breed, and other conditions on the disease and mortality pattern. Samples from fresh carcasses were collected aseptically from heart, liver, intestine and blood for bacteriological isolation and identification. The biochemical tests required were performed as per the method described by Edwards and Ewing (1972) and Cruickshank *et al.* (1975) to isolate and identify the bacteria. Fifteen pure cultures of biochemically positive *E. coli* isolates in EMB agar slants were sent to National Salmonella and Escherichia Centre, Central Research Institute, Kasauli, HP for serotyping.

The cultures were tested against 13 antimicrobial discs including Ampicilin, Amoxycillin, Chloramphenicol, Ciprofloxacin, Furazolidone, Sulphamethoxazole, Cefadroxyl, Enrofloxacin, Amikacin, Ofloxacin, Tetracycline, Norfloxacin and Trimethoprim (Himedia Laboratories Pvt Ltd, Mumbai). Dead chicks received by the department for post mortem were systematically necropsed, and pieces of organs such as liver, heart, lungs, kidney, proventriculus, bursa, air sac, intestine, spleen with representative lesions were collected in 10% formal saline. The tissues were trimmed

and processed according to routine procedure described by Luna (1968). The paraffin embedded tissues were cut into thin sections of 5-6 µ thickness and stained with Haematoxylin and Eosin (H & E) stain (Collins and Lyne, 1976).

RESULTS AND DISCUSSION

The first 3 weeks of post hatch life of a chick is considered to be crucial and requires special attention to contain such loss. Analysis of post mortem data showed, highest incidence of omphalitis with 974 cases (20.4%). It was closely followed by colisepticemia and enteritis with 839 (17.6%) and 500 (10.5%) cases. All the three disease conditions were recorded under one umbrella as colibacillosis. Anjaneyulu *et al.* (1998) studied the mortality pattern and established that the highest mortality was due to colisepticaemia and this was very much similar to our record. *E. coli* was isolated as the most predominant organism accounting for 72% of the total bacterial isolates. The other isolates belonged to the genera *Proteus, Salmonella, Pseudomonas, Staphylococcus, Streptococcus, Klebsiella, Enterobacter* (25 – 30%). All the bacteria were isolated and identified by its morphological, cultural and biochemical characteristics. Venkanagouda et al. (1996) reported that *E. coli* was the cause of highest loss which broadly coincides with that of our record. It was established that more than 50% of the total post mortem cases in young chick showed omphalitis, colisepticemia and enteritis. Hence the colibacillosis was the major cause of early broiler chick mortality and *Escherichia coli* were the most prevalent agent isolated which was supported by Srivastava (1990) and Terregino *et al.* (2000).

Pathological studies were conducted on the basis of post mortem findings, histopathology and isolation of causative microbial agents. In this study *E. coli* were serotyped as O1, O119 and O57. The isolates were subjected to antibiotic sensitive test using Disc Diffusion Technique and were found to be highly sensitive to Ciprofloxacin, Norfloxacin, Chloramphenicol and Furazolidone while they were partially sensitive to Amikacin, Ofloxacin and Tetracycline.

Photo 1: Distended abdomen and discoloured yolk: Omphalitis

Inflammation of the navel area, distended abdomen and discoloured yolk were commonly observed (Photo 1). Microscopically, thickening of yolk sac wall, congestion, oedema and necrotic changes along with sloughing of the epithelial lining in few cases were usually noticed (Photo 2). Heart showed thickening and inflammation of the pericardium (Photo 3). *E. coli* was isolated from most of these cases and was considered as one of the major cause of omphalitis.

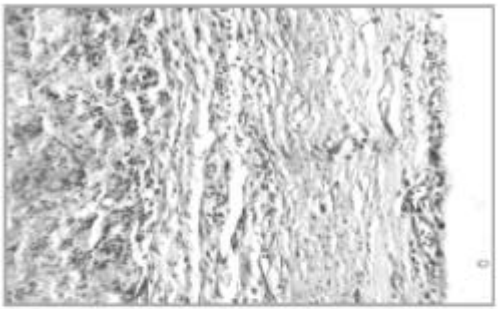

Photo 2: Photomicrograph of the yolk sac showed, thickening of sac wall, congestion, oedema and necrotic changes (H & E 100x)

In the present study, colibacillosis was one of the predominant killers of the young chicks. The necropsy findings included typical fibrinous pericarditis and perihepatitis (Photo 4). Microscopically, diffuse congestion with vacuolar degeneration and necrosis of liver was consistently associated which was almost pathognomonic in this condition (Photo 5). Hepatocytes showed diffuse fatty change and portal tract had mild cellular infiltration. Lungs and kidney revealed marked congestion and oedema in all the cases. Gangane *et al.* (2006) described similar changes. Heart showed myocardial congestion, oedema with focal infiltration of mononuclear cells and heterophils (Photo 6). In the case of enteritis there was marked congestion of intestinal serosa and mucosa with catarrhal exudates in the

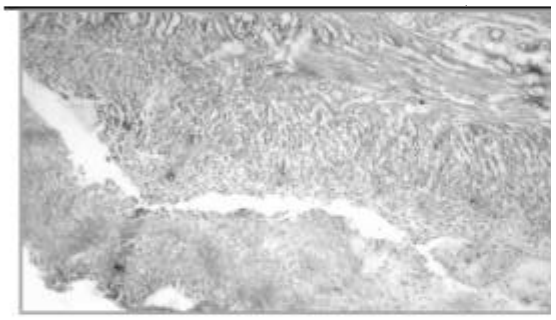

Photo 3: Photomicrograph of heart showed, thickening and inflammation of the pericardium (H & E 100x)

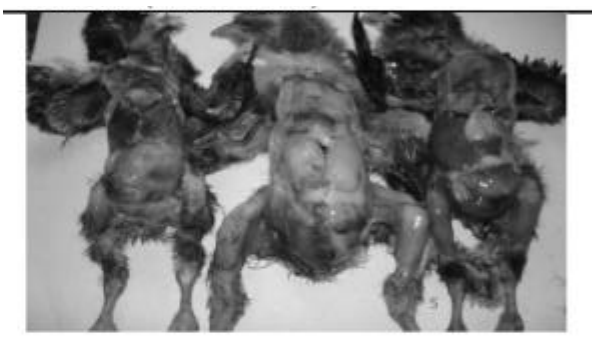

Photo 4: Fibrinous perihepatitis and pericarditis - Colibacillosis

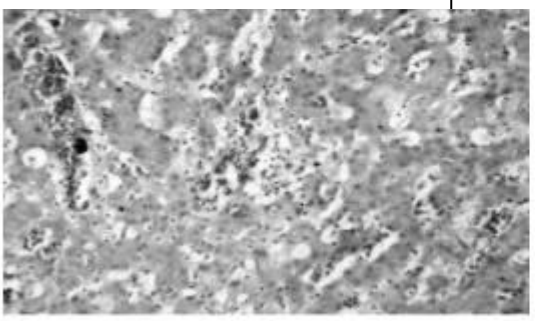

Photo 5: Photomicrograph of liver showed, diffuse congestion with vacuolar degeneration with coagulative necrosis. (H & E 400x)

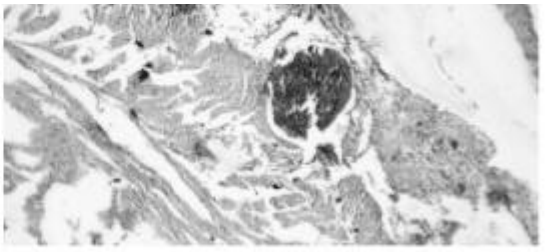

Photo 6: Photomicrograph of heart, showed, myocardial congestion, oedema with focal infiltration of mononuclear cells and heterophils(H & E 100x)

lumen in majority of the cases. Enlargement of liver with necrotic foci was observed in few of the cases of enteritis. Histopathological examination of small intestine revealed desquamation of epithelial lining cells and cellular infiltration in lamina propria.

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