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# PREVALENCE AND IN VITRO ANTIBIOGRAM OF BACTERIA ASSOCIATED WITH OMPHALITIS IN CHICKS

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## ABSTRACT

The present study was conducted for the isolation of bacterial agents and in vitro antibiogram of the isolates from the yolk and visceral organs of up to one week old broiler and layer chicks suffering from omphalitis. Samples from the yolk and visceral organs were aseptically collected and cultured on various selective and differential media. The isolated organisms were identified and subjected to commonly used antibiotics for determination of antibiogram. During the period of 39 months (May, 2002 to August, 2005), 330 samples from yolk and visceral organs were taken from those chicks which were not medicated with antibiotics, as per history provided by the poultry farmers. Among these, 223(68%) showed bacterial growth. Various bacteria isolated were *Escherichia coli* (47.93%), proteus (5.87%), mixed infection (3.59%), streptococci (2.89%), klebsiella (1.79%), salmonella (0.5%), staphylococci (0.5%), pseudomonas (0.5%), pasteurella (0.5%) and yarseinia (0.5%). The antibiotics found most effective were Norfloxacin (45.3%), Enrofloxacin (36.81%), Gentamicin (33.21%), Chloramphenicol (33.21%), Cephradin (25.1%), Augmentine (24.7%), Kanammycin (17.5%) and Ampicillin (12.1%).

**Key words:** Omphalitis, bacteriology, antibiogram, chicks.

## INTRODUCTION

The early chick mortality is considered to be an important and significant disease among the various infectious diseases. Omphalitis is becoming a major factor responsible for early chick mortality during the first few days after hatching (Reece and Beddome, 1983; Ijaz *et al.*, 1994). It is a bacterial infection of navel area, resulting from its failure to close properly following the drawing of the yolk sac into the abdominal cavity and this infection occurs due to the entrance of bacteria present in the environment. The infection is aggravated by poor hygiene on breeding farms and faulty management at the hatchery (Gordon and Jordon, 1982).

The present study was, therefore, conducted in the area of Peshawar, Mardan valley and surrounding areas from May, 2002 to August, 2005 to know about the prevalence and mortality during the early chick life. Attempt was also made to identify the causative bacteria of the disease and determine the susceptibility to the commonly used antibiotics so as to launch control measures against the early chick mortality.

## MATERIALS AND METHODS

In the present study, 330 severely ill or freshly dead birds up to one week of age, belonging to various poultry farms of Peshawar, Mardan and surrounding areas brought for the postmortem and disease diagnosis in the Poultry Disease Section of Veterinary Research Institute NWFP, Peshawar were included. Yolk sac and visceral organ samples were collected aseptically into sterilized Petri dishes. Inoculations were made from the yolk and visceral organ samples onto various selective and differential media (Cheesbrough, 1991). Discrete bacterial-colonies were obtained by streak plate method after incubation at 37$^{o}$C for 24-48 hours. Smears were prepared from the growth and examined to know the staining and morphological characteristics. The bacterial isolates were identified through their growth characteristics on various media, staining reactions, microscopic characteristics, biochemical and sugar fermentation tests (Collee *et al*., 1989).

The process of sub-culturing continued until pure growth was obtained. The pure colonies were transferred to sterilized Tryptose agar slants, which were stored for further studies.

### In vitro anitbiogram of isolates

All the bacteria isolated were tested in vitro for their sensitivity to 20 different antibiotics. These included Gentamicin, Norfloxacin, Kanamycin, Lincomycin, Flumequin, Oxytetracycline, Penicillin, Sulpha+Trimethoprim (Septran), Sterptomycin, Augmentin, Ampicillin, Ampiclox, Chloramphrenicol, Cloxacillin, Claforan (Cefotoxime Sodium), Cephradin, Doxycyclin, Erythromycin, Amoxycillin and Enrofloxacin. The sensitivity of the organisms to antibiotics was studied through the method described by Bauer *et al.* (1966).

## RESULTS AND DISCUSSION

A total number of 223 isolates of 10 species were isolated from the 330 bird samples suffering from Omphalitis (Table 1). Different bacterial species associated with omphalitis in the present study have been confirmed in earlier studies (Ijaz *et al.*, 1994). The highest incidence of *Escherichia coli* (83.9%) recorded in the present study is supported by Ijaz *et al.* (1994).

**Table 1: Relative prevalence of bacterial agents associated with omphalitis in chicks**

| Bacterial agents isolated | Numbers | %age |
|---|---|---|
| *Escherichia coli* | 187 | 83.9 |
| Proteus | 13 | 5.8 |
| Mixed infection | 08 | 3.9 |
| Streptococci | 06 | 2.7 |
| Klebsella | 04 | 1.8 |
| Salmonella | 01 | 0.5 |
| Staphylococci | 01 | 0.5 |
| Pasteurella | 01 | 0.5 |
| Pseudomonas | 01 | 0.5 |
| Yersinia | 01 | 0.5 |

This highest prevalence of *E. coli* is presumably due to the fact that *E. coli* is the commonest environmental contaminants of poultry farms. Proteus, Streptococci, and mixed growth were the second after *E. coli*. The presence of these bacteria was indicative of substandard conditions at hatcheries and poultry farms. Since the unabsorbed yolk in the young chicks provides a suitable medium for the multiplication of bacteria, therefore the establishment of infection with these organisms could readily take place. It is therefore, suggested that chicks should be obtained from those hatcheries which adopt strict hygienic measures during the whole hatching process. Moreover, hygienic environment should be provided to the young chicks during brooding and special attention should be paid to the humidity in the brooding house.

The bacterial isolates were subjected to 20 antibiotics for testing their susceptibility (Table 2). The results showed that the isolates were sensitive to Norfloxacin (45.3%), Enrofloxacin (36.81%), Gentamicin (33.21%), Chloramphinicol (33.21%), Cephradin (25.1%), Augmentin (24.7%), Kanamicin (17.5%), Ampicillin (12.1%), Doxycyclin (10.8%), Sulpha+Trimethoprim (Septran) (8.1%), Flumequin

**Table 2: Antibiotic susceptibility of individual isolates (%)**

| Antibiotics | Bacterial species | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | E-coli | Proteus | Klebsella | Strepto | Salmo | Staphylo | Pseudo | Yersinia | Pasteur | Mixed infection |
| Gentamicin | 37.10 | 30.8 | 75 | 33.3 | 0 | 0 | 100 | 100 | 0 | 12.25 |
| Norfloxacin | 44.9 | 61.5 | 75 | 33.3 | 100 | 100 | 100 | 0 | 0 | 12.25 |
| Kanamycin | 18.2 | 7.7 | 0 | 33.3 | 100 | 0 | 0 | 100 | 0 | 12.25 |
| Lincomycin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Flumequin | 8.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12.25 |
| Oxytetracycline | 3.7 | 0 | 0 | 16.7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Penecillin | 0 | 0 | 0 | 0 | 100 | 100 | 0 | 100 | 0 | 12.25 |
| Sulpha+ Trimethoprim | 9.09 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Streptomycin | 5.9 | 0 | 0 | 0 | 0 | 0 | 100 | 100 | 0 | 12.25 |
| Augmentin | 26.2 | 23.07 | 25 | 0 | 0 | 0 | 0 | 0 | 100 | 0 |
| Ampicillin | 10.16 | 15.38 | 0 | 33.3 | 100 | 100 | 0 | 100 | 100 | 0 |
| Ampiclox | 1.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chloram-phenicol | 33.68 | 15.38 | 25 | 33.3 | 100 | 0 | 0 | 100 | 100 | 0.5 |
| Cloxcilline | 0.53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Claforan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cephradin | 26.7 | 7.7 | 25 | 33.3 | 0 | 0 | 0 | 100 | 0 | 0 |
| Doxycycline | 10.7 | 0 | 0 | 33.3 | 0 | 100 | 0 | 0 | 0 | 12.25 |
| Erythromycin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Amoxcycilline | 10.7 | 23.07 | 0 | 33.3 | 100 | 0 | 0 | 100 | 100 | 0 |
| Enrofloxacin | 36.4 | 46.15 | 50 | 33.3 | 100 | 100 | 100 | 0 | 100 | 0 |

Salmo=Salmonella, Strepto= Streptococci, Staphylo= Staphylococci, Pseudo= Pseudomonas, Pasteur= Pasteurella

(7.2%), Streptomycin (6.7%), Oxytetracyclin (3.6%), Penicillin (1.8%) and Ampiclox (1.3%). However, no response to Lincomycin, Claforan (Cefotoxime sodium) and Erythromycin (0%) was recorded.

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