

SEROTYPING AND DRUG SENSITIVITY OF ESCHERICHIA COLI ISOLATED FROM DIARRHOEIC AND NONDIARRHOEIC CALVES

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ABSTRACT

One hundred forty five fresh faecal samples were collected randomly from both diarrhoeic and nondiarrhoeic calves below 35 days of age from Guwahati and nearby areas of Assam, of which 90 (62.07%.) samples were found to be positive for E.coli infection. The 'O86' serogroup in diarrhoeic calves and the O172 serogroup in nondiarrhoeic calves was found to be predominant. The drug sensitivity pattern of the isolated organisms to 12 antimicrobial agents revealed that the isolated and tested strains of *Escherichia coli* were highly sensitive to *gentamicin*, *nalidixic acid* and *norflxacin*, followed by *neomycin*, *chloramphenicol*, *amoxicillin*, *streptomycin*, *furazolidone*, *tetracycline* and *co-trimoxazole*, while they were resistant to *ampicillin* and *sulfadiazine*.

KEY WORDS: Calf, Antibiogram, Drug sensitivity , Serogroup

INTRODUCTION

Collibacillosis occurs in all species of new born farm animals and is a major cause of losses. Neonatal diarrhea of cattle with high mortality is one of the stumbling blocks for the cattle breeders of our country. Specific serotype is the causative agent of collibacillosis. The definite etiological diagnosis of enteric collibacillosis will depend on isolation and characterization of *E.coli* from intestine and faeces of affected animals (Blood et al.,1983). The present investigation was undertaken to isolate, serotyping and study of antibiogram of *E.coli* associated with or without diarrhea in calves.

MATERIALS AND METHODS

A total of 145 fresh faecal samples were collected randomly from 85 diarrhoeic and 60 nondiarrhoeic calves of 1-35 days of age belonging to Government and private farms in and around greater Guwahati and nearby areas of Assam.

The faecal samples were collected aseptically in sterile test tubes containing nutrient broth. All the samples were inoculated into MacConkey's lactose broth and incubated at 37°C for 24 hours for primary isolation and identification and the tentative *E.coli* colonies were tested culturally and biochemically as per methods described by Edwards and Ewing (1972) and Cruickshank et al.,(1975).

Ninty isolates were sent to the National Salmonella and Escherichia Centre, Central Research Institute, Kausuli,(HP), India for serotyping

E.coli isolates after confirmation were subjected to antimicrobial sensitivity test with 12 antimicrobial discs by using single disc diffusion technique (Cruickshank et al.,1975).Following antimicrobial discs (concentration of antimicrobials mentioned in the parenthesis) *ampicillin* (30µg), *amoxicillin/clavulanic acid* (30 µg), *neomycin* (30 µg), *streptomycin* (10 µg), *gentamicin* (10 µg) , *chloramphenicol* (30 µg), *tetracycline* (30 µg), *co-trimoxazole* (5 µg), *furazolidone* (50 µg), *nalidixic acid* (30 µg), *norfloxacin* (10 µg) and *sulphadiazine* (300 µg) were used . The antimicrobial discs were obtained from Hi-Media Laboratories Ltd. Bombay, India. The results were interpreted using the Zone size

interpretative table provided by the manufacturer.

RESULTS AND DISCUSSION

In the present study overall 90 (62.07 %) faecal samples were found to be positive for *E.coli* infection, of which 69 (76.66%) samples were from diarrhoeic calves and 21(23.33%) samples were from nondiarrhoeic calves.

Out of 69 isolates from diarrhoeic calves, a total 13 *E.coli* serotypes were identified viz. O86 fifteen strains (18.84%), O82 (twelve strains, 17.39%), O138 (nine strains,13.04 %), O105 (six strains,8.70 %), O39, O20, O64, O25, O13, O103, O118, O156, O2 (three strains each ,4.35%).

Out of 21 nondiarrhoeic calves, a total of two *E.coli* serotypes viz. O172 (fifteen strains,71.43%); O109 (three strains14.29%) and untypable(three strains,14.29%) were found.

The isolation of *E.coli* serogroups like O86, O138, O25,O20 , O118, O156, O103 and O2 were found to be significant. Similar serogroups were also reported from diarrhoeic calves by various workers from different places of India (Panwar et al,1990; ; Yadav et al. ,1995 ; Wani et al., 2004 and Sharma et al.,2006).

In vitro antibiotic sensitivity test showed that all the isolates tested were highly sensitive to *gentamicin*, *nalidixic acid* and *norfloxacin* (100% each), followed by *neomycin* (97.56%),*chloramphenicol* (95.56%), *amoxicillin* (93.33%), *streptomycin* (91.11%), *furazolidone* (82.22%),*tetracycline* (68.89%) and *co-trimoxazole* (57.78%). All the strains showed resistance to *ampicillin* and *sulphadiazine*.

In this study maximum sensitivity was noticed to gentamicin, nalidixic acid and norfloxacin. Present finding was comparable with Hussain and Saikia (2001) who observed almost similar findings in regard to sensitivity to these antibiotics in samples collected from Guwahati and nearby areas of Assam. Paul et al. (2010) reported that *E.coli* were highly sensitive to *norfloxacin*, while Ramprabhu (2003) reported 90-100% sensitivity to *gentamicin*, *norfloxacin* and 100% resistance to *tetracycline* and *ampicillin* in calf. On the other hand Kiriuki (1977) found *streptomycin*, *gentamicin*, *nalidixic acid*, *cotrimoxazole* and *sulphadiazine* to be resistant to *E.coli* in their study.

Moderate sensitivity to *tetracycline* and *cotrimoxazole* as observed in the present study was comparable with the findings of Hussain and Saikia (2001). The authors opined that increased drug resistance towards *ampicillin* and *sulfadiazine* suggest the possibility of their indiscriminate use in animals of the areas in their study.

The pattern of resistance of *E.coli* as observed in the present study to ampicillin was comparable with Wani et al. (2003) who found antimicrobials like *tetracycline* and *ampicillin* to be resistant to *E.coli* isolated from diarrhoeic calves.

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