ISOLATION, CHARACTERIZATION AND ANTIBIOTIC SENSITIVITY OF CLOSTRIDIUM PERFRINGENS ISOLATED FROM DIARRHEIC GOATS

Dipti Verma, Yamini Verma, Madhu Swamy and Amita Dubey

Department of Veterinary Pathology

College of Veterinary Science and A.H., N.D.V.S.U., Jabalpur – 482001

Received 26/07/2014 Accepted 23/08/2014

Corresponding Author : diptiverma08@gmail.com / dryaminiverma@rediffmail.com

ABSTRACT

The present study was conducted for isolation, characterization and antibiotic sensitivity of Clostridium perfringens organism from diarrheic goats. A total of 25 rectal swabs were collected from different goat farms of Jabalpur (M.P.). Out of 25 rectal samples 15 (60%) were found to be positive for Clostridium perfringens. From the positive samples, antimicrobial sensitivity test was performed by discs diffusion method. Most of the isolates of Clostridium perfringens were found sensitive to Penicillin, Ciprofloxacin and Levofloxacin and resistant to Gentamycin, Streptomycin and Chloramphenicol. All the isolates except one were resistant to Neomycin.

KEYWORDS: Antibiotic sensitivity, *Clostridium perfringens*, caprine, diarrhea

INTRODUCTION

Clostridium perfringens can be a normal inhabitant of the intestines of most animal species (Niilo, 1980) including humans, but when the intestine is altered by sudden changes in diet or other factors, *Clostridium perfringens* proliferates in large numbers and produces several potent toxins and can be absorbed into the general circulation producing systemic effects, or can act both locally and systemically usually with devastating effects on the host (Lewis, 2000). Indiscriminate usage of antibiotics in animals for the treatment of various bacterial infections has lead to emergence of resistant strains (Cohen, 2000). Therefore, the present study was undertaken to evaluate sensitivity of selective antimicrobials in order to know the first choice of clinician for control, prevention and treatment of disease.

MATERIALS AND METHODS

Twenty five goats and kids irrespective of age, sex and breed from the organized and unorganized goat farms in and around, Jabalpur were used for the present study. Total 25 rectal swabs were collected aseptically with the help of sterile transport swabs from goats/kids with signs of diarrhea for bacteriological examination. Bacterial isolation was done by inoculating the sample in nutrient broth, streaking growth on sheep blood agar plates, and haemolytic colony transferred in to Robertson's cooked meat media. The isolates were identified on the basis of cultural, morphological and biochemical characteristics. *In vitro* antibiotic sensitivity test of the cultural isolates was conducted on Muller Hinton agar plates as per the method described by Wust (1977) using 10 antibiotic discs. All the media and discs were supplied by Hi Media Laboratory Mumbai.

RESULTS AND DISCUSSION

Direct impression smear were prepared from rectal contents on microslide and stained by Gram's method of staining. On examination 40% (10/25) rectal contents showed Gram positive bacilli. Haemolytic colonies were observed in 15 out of 25 cases. Total 15 isolates were confirmed as *Clostridium perfringens* morphologically by Gram's staining, cultural characteristics and biochemical tests. The isolated *Clostridium perfringens* produced haemolytic colonies on blood agar and saccharolytic colonies on cooked meat media. The non-motility of *Clostridium perfringens* was

confirmed by hanging drop method which is in agreement with that of Cheung *et al.* (2004).

All the isolates from rectal content were found negative, for Methyl red, Voges Proskauer, Indole and Citrate tests. All the isolates develop yellow colour and black precipitate were indicative of positive for Triple sugar iron test. Similar results were observed by Gibert *et al.* (2001) and Rahaman *et al.* (2013). Eighty six per cent isolates (13/15) showed positive results for nitrate reduction test by development of bright red color of nitrate broth. These findings are in accordance with those of Singh *et al.* (2005). The negative result may be due to some biochemical variants of *C. perfringens.* When tested for gelatin liquefaction test, all the isolates were found positive. Development of an opalescent change around the colonies in Egg yolk agar showed lecithinase activity by all isolates. All the isolates of *Clostridium perfringens* were able to ferment carbohydrates viz. lactose, xylose, maltose, fructose, dextrose, galactose, raffinose, trehalose, melibiose, sucrose, l-arabinose, and mannose.

Antibiotic sensitivity tests indicated maximum percentage of C. perfringens were sensitive to Penicillin (93.33%) followed by Ciprofloxacin (86.66%), Levofloxacin (80%), Enrofloxacin (73.33%), Amoxacilin (53.33%), Chloramphenicol (46.66%), Azithromycin (40%), Gentamicin (33.33%) and Streptomycin (26.66%). Maximum isolates of *C. perfringens* were found resistant to Neomycin. Similar findings were also observed by Rahaman *et al*. (2013). In present study, Chloramphenicol was less sensitive to *C. perfringens* isolates (46.66%). These findings are contraindicated with the finding of Rood, *et al*. (1978) who reported that Chloramphenicol showed an excellent activity against all the C. *perfringens* strains. It may be recommended from this study that Penicillin and Ciprofloxacin in optimum doses would resolve most cases of diarrhea of Clostridial origin

REFERENCES :

Cheung, J.K., Awad, M.M., McGowan, S. and Rood, J.I. (2004). J. Vet. Microbiol., **105**: 130-136.

Cohen, M.L. (2000). Nature, 406: 762-767.

Gibert, M., Jolivet-Reynaud, C. and Popoff, M.R. (2001). Gene, **203**: 65-73.

Lewis, C.J. (2000). Clostridial diseases. In: Martin, W.B., Aitken, I.D. (eds.). Diseases of sheep, Blackwell Science, Oxford, England, pp 131-142.

Niilo, L. (1980). Can. Vet. J., **21**: 141–148.

Rahaman, M.S., Aktera, M.R., Abdullaha, M., Sayed Khanb, M.A., Jahanc, M.S., Ziaul Haqued, A.K.M. and Lutful Kabire, S.M. (2013). Scientific J. Microbiol., **2(4)**: 83-88.

Rood, J.I., Maher, E.A., Somers, E.B., Campos, E. and Duncan, C.L. (1978). Antimicrobiol. Agents Chemother., **13**: 871-880.

Singh, R.V., Bhilegaonkar, K.N. and Agarwal, R.K. (2005). J. Food Safety, **25**: 146-156.

Wust, J. (1977). Antimicrob. Agents Chemother., **11**: 631-637.

❑