

Antimicrobial Sensitivity Assay of *Escherichia coli*

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Abstract

Sensitivity test was executed for 35 isolates of *Escherichia coli* (21 of poultry, 06 of calves and 08 of human) and ATCC 25922 reference strains intended for common antibiotics. The result showed that Ceftriaxone was most effective (37.14%) drug among all whereas Nalidixic acid and Amoxyclave both were resistant (62.85%). Kanamycin and Streptomycin was most sensitive drug (42.8%) whereas Vancomycin and Amoxyclave was resistant drug (61.9%) against poultry isolates. Ceftriaxone was most sensitive drug (50%) whereas Streptomycin, Nalidixic acid and Kanamycin were resistant (75%) against isolates of human diarrhea samples. Vancomycin and Amoxyclave were most sensitive but Nalidixic acid and Gentamicin showed 100% resistant for calves' diarrhea samples.

Keywords: Antibiotic sensitivity, antibiotics and resistant

Introduction

In the present study antibiotic sensitivity test has been performed for the pathogenic isolates of *Escherichia coli* isolated from poultry postmortem, calf diarrhea and human infants' diarrhea samples.

Materials and methods

A total of 120 comprising of 80 Poultry post mortem, 20 calves diarrhea and 20 human infants diarrhea samples were collected and processed for the isolation of *Escherichia coli*. The isolates were subjected to *in vitro* antibiotic sensitivity test (Bauer *et al.*, 1966) against frequently used antibiotics viz. Streptomycin (10 µg), Nalidixic acid (30µg), Vancomycin (30 µg), Ceftriaxone (30 µg), Kanamycin (30 µg), Amoxyclave (30 µg), Enrofloxacin (30µg) and Gentamicin (10µg).

Results and discussion

The results were prepared following Performance standards for Antimicrobial Disk Susceptibility Tests. Overall, Ceftriaxone was most effective (37.14%) drug where as Nalidixic acid and Amoxyclave both were found to be most resistant (62.85%).

Antibiotic sensitivity pattern of isolates collected from different species had been depicted (Table 1) that Kanamycin and Streptomycin both was most sensitive (42.8%) whereas Vancomycin and Amoxyclave were most resistant (61.9%) in poultry infections. Ceftriaxone was most sensitive (50%) whereas Streptomycin, Nalidixic acid and Kanamycin were most resistant (75%) in human diarrhea samples. Vancomycin and Amoxyclave were found to

be most sensitive on the other hand Nalidixic acid and gentamicin showed 100% resistant in isolates of calves diarrhea samples.

Antibiotic sensitivity test showed that most of the isolates were resistance to Nalidixic Acid (62.85%), Amoxyclave (62.85%) and Gentamicin (60.00%) agreeing with Zakaria *et al.* (2010) and Wayne *et al.* (2004). Majority of the strains showed multiple resistances as in human infant diarrhea samples among Streptomycin (75%), Nalidixic Acid (75%) and Kanamycin (75%) might be due to the resistome gene that confers resistance or due to transfer of genes from non disease causing bacteria to those that do cause disease, leading to clinically significant antibiotic resistance (Wright, 2010). As much as 100% resistance was shown in isolates from calf diarrhea samples towards Nalidixic Acid and Gentamicin perhaps due to the widespread and indiscriminate use ensuing resistance (Bogaard *et al.*, 2001).

Summary

The antibiogram assay of pathogenic *E. coli* isolates was done in the present study. None

of the antibiotic was completely effective (100% sensitivity) against isolates from different sample. However two antibiotics i.e. Nalidixic acid and Gentamicin were found to be 100% effective against *E.coli* isolates from calves diarrhoea sample. Ceftriaxone (37.14%) was found to be most sensitive drug in overall antibiotic sensitivity pattern. Against poultry postmortem isolates Kanamycin and Streptomycin (42.85%) were highly sensitive Vancomycin and Amoxyclave (33.33%) were most sensitive against isolates from calves’ diarrhoea sample. Ceftriaxone (50%) was effective against isolates from human infant’s diarrhoea sample. The resistance of bacterial isolates to antibiotic varied from 42.85% to 62.85% in overall antibiotic sensitivity test pattern and 19.04% to 100% in pattern of antibiotic sensitivity in isolates of different sources.

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Table 1: Antibiotic sensitivity pattern in isolates of different sources.

Sr. No.	Antibiotics	Poultry Isolates			Human diarrhea sample			Calves diarrhea sample		
		R	I	S	R	I	S	R	I	S
1	Streptomycin (S)	4 (19.04%)	8 (38.09%)	9 (42.85%)	6 (75%)	0 (0%)	2 (25%)	5 (83.33%)	1 (16.7%)	0 (0%)
2	Nalidixic Acid (NA)	10 (47.61%)	6 (28.57%)	5 (23.80%)	6 (75%)	2 (25%)	0 (0%)	6 (100%)	0 (0%)	0 (0%)
3	Vancomycin (VA)	13 (61.90%)	5 (23.80%)	3 (14.28%)	4 (50%)	4 (50%)	0 (0%)	2 (33.33%)	2 (33.33%)	2 (33.33%)
4	Ceftriaxone (CTR)	10 (47.61%)	3 (14.28%)	8 (38.09%)	3 (37.5%)	1 (12.5%)	4 (50%)	5 (83.33%)	0 (0%)	1 (16.7%)
5	Kanamycin (K)	9 (42.85%)	3 (14.28%)	9 (42.85%)	6 (75%)	1 (12.5%)	1 (12.5%)	5 (83.33%)	1 (16.7%)	0 (0%)
6	Amoxyclave (AMC)	13 (61.90%)	5 (23.80%)	3 (14.28%)	5 (62.5%)	2 (25%)	1 (12.5%)	4 (66.7%)	0 (0%)	2 (33.33%)
7	Enrofloxacin (Ex)	10 (47.61%)	4 (19.04%)	7 (33.33%)	2 (25%)	3 (37.5%)	3 (37.5%)	5 (83.33%)	1 (16.7%)	0 (0%)
8	Gentamicin (GEN)	12 (57.14%)	7 (33.33%)	2 (9.52%)	3 (37.5%)	3 (37.5%)	2 (25%)	6 (100%)	0 (0%)	0 (0%)

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