Environment & Ecology 27 (4) : 1524–1525, 2009
 ISSN 0970-0420

Antibiogram of *Escherichia coli* Isolated from Infected Bovine Genitalia

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Abstract

A total of 39 (25.8%) *Escherichia coli* isolates were detected from 151 genital swab samples collected from bovine genital infections. Among positive samples highest percentage of positivity (28.8) were observed in uterine infections (metritis), followed by cervicitis (27.6%) and vaginitis (20.8%). *In vitro* antimicrobial sensitivity showed that these were most sensitive to gentamicin and kanamycin (100%) followed by amikacin (95%), ciprofloxacin (90%). The drugs like cefixime, vancomycin, erythromycin and novobiocin (100%) were found to be ineffective against these isolates.
Key words : *Escherichia coli,* Genital infections, Bovine, Antibiogram.

India is basically a rurally oriented and land based country with approximately 76.27% rural population. It mainly depends on agriculture with 15% of world's cattle population and 53%of buffalo population (Prasad 2001). Among these huge populations of cattle approx 18–40% were culled each year due to infertility or sterility causes (ICAR 2002). Infectious infertility is the main cause of their low productivity (Kuyucuoglu et al. 2004). Among different causes of infections leading to infertility, apart from the leading bacterial pathogens like *Brucella* sp., *Campylobacter* sp., *Leptospira* sp., *Listeria* sp., few non-specific pathogens like *Escherichia coli*, *Pseudomonas* sp., Streptococci, Staphylococci are also found to be associated with these conditions. Escherichia coli were detected to be the most common of all the pathogens playing important role in infectious infertility cases along with specific pathogens (Sharda and Krishnan 2001). Uropathogenic *Escherichia coli* (UPEC) cause urinary tract infection leading to genital tract infections also (Gyles 1992). Therefore, present study was aimed at identification, characterization and antibiogram of *Escherichia coli* isolated from bovine infected genital tracts.

Methods

Both the swab samples (87) and postmortem samples (64) were collected from infected and slaughtered bovines aseptically. All the samples were taken to the laboratory for further study under ice cover. After enriching the samples in nutrient broth for 18 hours at 37C these were streaked on to the MacConkey's agar plates and incubated at 37C for 24—48 hours. The typical pink colonies of Escherichia coli were picked and further streaked on to EMB agar plate for further purification. After incubation, the violet colored, opaque, smooth tentative colonies of Escherichia coli with bright metallic sheen were collected and stored in nutrient agar slants for identification. These were identified on the basis of morphology, cultural characters and biochemical reactions (IMViC reaction, TSI reaction, urease test, H_2S production test, nitrate reduction test) according to Wilson and Miles (1975). All the isolates were serotyped at National Salmonella and Escherichia Center, Kasauli, HP.

Antimicrobial drug sensitivity was tested following Bauer et al. (1966). Young broth cultures of strains were then flooded to nutrient agar plates, previously dried in incubator (37C) for 30 minutes to remove excess moisture from the surface. Antimicrobial discs were then gently fixed on the dry agar surface with the help of sterile forceps at an appropriate distance, 4 cm apart of at least 15 mm form edge of plates. Then the plates were incubated at 37C for 24 hours in an

inverted position. The reading was recorded after 24 hours of incubation at 37C.

Results and Discussion

Out of 151 samples collected from different parts of bovine genital tract and the swabs, only 39 (25.8%) positive samples were detected to be Escherichia coli. Highest positivity was observed from metritis cases. (45 samples yielding 13 positive isolates i.e.28.8%) followed by cervicitis (16 positive cases from 58 samples i.e. 27.6%) and vaginitis (10 positive cases from 48 samples i. e. 20.8%) cases. Such incidences of Escherichia coli infection in bovine genital tracts were also reported by Sharda and Krishnan (2001), Kuyucuoglu et al. (2004).Shukla and Pandit (1989) found 33.2% positivity whereas only 12.6% positive cases were reported by Younis et al. (1987) which might be due to environmental and geographical effects. So the present study almost correlates with the findings of previous workers. All the isolates showed typical results in cultural and biochemical characterization (Indole, MR and nitrate reduction–positive; VP citrate, urease test and H_2S production—negative; TSI reaction—acid butt, acid slant) bosed on Edwards and Ewing (1961). The predominant serotypes were 028, 0126, 0119 and 078 which were also supported by Ahmed et al. (2007).

Antibiogram of all 39 isolates of *Escherichia coli* were tested to 10 different antibiotics commonly available in market. The most effective antibiotics were gentamicin and kanamycin (both 100%), amikacin (95%), ciprofloxacin (90%) and sulfarazole (77.5%) followed by the resistant drugs like cefixime, vancomycin, erythromycin, novobiocin (all 100%) and methicillin (82.5%). Roy et al. (2002) also found gentamicin (100%) to be most effective drug in these conditions. This report was also supported by Krishnan et al. (1994), Sharma and Singh (2000).

Therefore it can be concluded that *Escherichia coli* (028, 0126, 0119 and 078) are among of few main pathogens causing genital tract infections in bovines and gentamicin was found to be the drug of choice in these infections.

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