Therapeutic Management of Urinary Tract infection in a Mare

N. Sweetline Anne, S. Febina Bernice Sharon, S. Parthiban and S. Malmarugan
Department of Veterinary Microbiology
Veterinary College and Research Institute
Tamilnadu Veterinary and Animal Sciences University (TANUVAS)
Tirunelveli - 627358 (Tamil Nadu)

Abstract
A Thoroughbred mare was presented with history of urinary tract infection for past 2 days. Clinical examination revealed frequent urination and discolored urine. Urine were found positive for Corynebacterium renale based on detailed cultural, morphological and biochemical test. Antimicrobial sensitivity studies indicated resistance to Penicillin G and Cefotaxime, intermediate to Streptomycin and sensitive to Enrofloxacin, Ciprofloxacin, Chloramphenicol, Streptomycin, Amoxycillin and Gentamicin. The affected animal was treated with Inj. Enrofloxacin @ 1ml/20 kg b. wt. IM for 5 days, Inj. Tolfenamic acid @ 2 mg/kg b. wt. IV as a single dose and supportive therapy. The animal recovered completely within five days of therapy.

Keywords: Antimicrobial sensitivity; Corynebacterium renale; mare; urinary tract infection

Introduction
Corynebacterium species are Gram positive, catalase-positive, aerobic or facultatively anaerobic non-motile rods often with clubbed ends occurring singly or in pairs. Some cells may stain unevenly giving a beaded appearance. Their size is between 2-6µm in length and 0.5µm in diameter. They group together in a characteristic way, which has been described as the form of a ‘V’, ‘palisades’, ‘picket fence’ and ‘Chinese letter’ arrangements (Winn et al., 2008). The genus contains the species Corynebacterium diphtheriae and the nondiphtherial Corynebacterium, collectively referred to as diphtheroids. Non diphtherial corynebacteria, originally thought to be mainly contaminants, have increasingly over the past 2 decades and have been recognized as pathogenic.

Non diphtherial Corynebacteria also cause chronic and subclinical diseases in domestic animals and lead to significant economic losses for farmers. Corynebacterium renale, Corynebacterium cystidis and Corynebacterium pilosum, are opportunistic pathogens that inhabit the urinary tract of cattle and other domestic animals, where they cause cystitis and ascending pyelonephritis sporadically (Baird et al., 2007). These organisms through the use of their pilus, attach themselves to their favored environment in the bladder, ureters, kidney, pelvis and kidney tissue of cows occasionally horses and sheep (Yanagawa et al., 1970). This paper documents incidence of C. renale induced urinary tract infection and its therapeutic management in a mare.

History and Clinical examination
A five year old Thoroughbred mare was presented with history of urinary tract infection for past two days. Clinical examination revealed frequent urination and discolored urine. The animal also exhibited restlessness, increased rectal temperature, respiration and pulse rate. Samples such as urine and vaginal swabs were collected for clinical diagnosis. Urine sample were subjected to bacteriological isolation studies. Nutrient agar and 1% Potassium tellurite agar were used as primary culture media for isolation of organisms from samples according to methods described by Quinn et al. (2004). Culture plates were incubated at 37°C for 24 hours and colonies were subjected for cultural, morphological and various biochemical test viz., Catalase, Oxidase, Urease test as per methods described by Barrow and Feltham (1993). The isolates were subjected to in vitro antibiotic sensitivity as per method described by Bauer et al. (1966).

Results and Discussion
Growth in nutrient agar reveled translucent
granular colonies, gram staining of transparent colonies revealed gram positive pleomorphic rods with irregular arrangements (Fig.1). Individual colonies from nutrient agar were picked and streaked on 1% Potassium tellurite agar and incubated at 37°C for 48 hours. Potassium tellurite medium, serves as a selective and differential medium for Corynebacterium sp. In the Potassium tellurite agar they produced characteristic black colored colonies (Fig. 2) upon staining revealed gram positive pleomorphic rods with irregular arrangements. Further isolates from nutrient agar and Potassium tellurite were catalase and urease positive (Fig. 3).

Isolates from nutrient agar and Potassium tellurite agar is confirmed as Corynebacterium renale on basis of cultural, morphological and biochemical characters these results are in agreement with Barrow and Feltham (1993). Antimicrobial sensitivity studies indicated resistant to Penicillin-G and Cefotaxime, intermediate to Streptomycin and sensitive to Enrofloxacin, Ciprofloxacin, Chloramphenicol, Streptomycin, Amoxyclyva and Gentamicin. The affected animal was treated with Inj. Enrofloxacin (Quinlax®) @ 1ml/20 kg b. wt. IM for 5 days, Inj. Tolfenamic acid (Maxxtol-XP®) @ 2 mg/ kg b. wt. IV as a single dose. and Inj. Tribivet® (Thiamine+ Pyrodoxin+Cynocobalin) @ 10ml/ animal IM for 5 days. The animal was recovered completely within five days of therapy.

Corynebacterium sp. are fastidious organisms, growing slowly on enriched medium like blood agar and potassium tellurite agar. On blood agar, they form small greyish colonies with granular appearance, mostly translucent, but with opaque centers, convex, with continuous borders. Their optimum growth temperature is 37°C. C. renale is highly adapted to urinary tract through its complex structure and metabolism. They are facultative anaerobes, organism multiples in bovine urine, it becomes strongly alkaline. This is because of C. renale contains the enzyme urease (Timoney et al., 1988). In particular, urease catalyzes the hydrolysis of urea into carbon dioxide and ammonia. Organisms that tend to produce urease tend to be gastrointestinal or urinary tract pathogens, since urease enables them to neutralize the acid present in their acidic environments. Penetration and colonization of urinary tract is aided by the ability of C. renale to stick to aging epithelial cells. However, other predisposing factors such as pregnancy or parturition are required for disease to occur. Transmission between animals occurs when
contaminated droplets of urine are splashed on vulvar area of a susceptible animal from an infected carrier. However, research has also shown that C. renale can be found in healthy animals of diseased herds without affecting them (Timoney et al., 1988).

Potassium tellurite inhibits most upper respiratory tract normal flora other than Corynebacterium species and also inhibits the growth of majority of gram-negative bacteria. This medium is differential on the basis of ability of Corynebacterium species to reduce tellurite whereas diphtheroides found in upper respiratory tract are not able to reduce tellurite. Potassium tellurite acts as a selective agent and has inhibitory activity against most gram-positive and gram-negative bacteria except Corynebacterium species. C. renale is sensitive to Penicillin, Streptomycin, Kanamycin, Erythromycin and Polymycin B (Timoney et al., 1988). Therefore, Penicillin in large doses is the antibiotic of choice in therapy and is often effective if administered before lesions have become far advanced.

References

44th Dairy Industry Conference
and
International Trade Fair on Dairy farming, processing, packaging, distribution and products
on
18-20th February 2016
at
ICAR- National Dairy Research Institute
Karnal, India

For details, log on to http://www.dairyexhibition.com

370