Bacterial flora of urinary bladder of cattle in Zaria, Nigeria

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Key words

Zebu cattle - *Staphylococcus aureus* - *Corynebacterium renale* - Bladder - Nigeria.

Summary

The bacterial flora from urinary bladder of 40 cattle slaughtered in Zaria abattoir in Nigeria is reported. Ten bacterial isolates were identified. *Staphylococcus aureus* was the most frequent isolate, with a prevalence of 22.5%. Sixteen (40%) of the urine samples examined were cloudy in appearance and 11 (68.8%) of these had no bacterial growths. *Corynebacterium renale* was isolated from 5 (12.5%) animals, even though there was no apparent disease or pyelonephritis.

■ INTRODUCTION

Urine, secreted by the kidneys, is sterile in healthy animals. However, it could contain normal flora bacteria or, eventually, urinary tract infection bacteria (9). Contagious bovine pyelonephritis is a specific infection of cattle urinary tracts, primarily caused by *Corynebacterium renale*. This disease, which is widespread in Europe and North America (6), is characterized by purulent inflammation and necrosis of the kidneys, ureter and urinary bladder (6, 7, 14). Some bacteria cause pyelonephritis in cattle, with or without the presence of *C. renale* (6, 7).

Most reports of bovine pyelonephritis and *C. renale* infections are from temperate regions, where increases in clinical cases usually occur in the colder seasons (1, 6). The disease is less commonly reported from the tropics (1, 11, 12) and cattle are seldom affected before maturity (6).

■ MATERIALS AND METHODS

Source of samples

Urinary bladder samples were obtained from 40 zebu cattle slaughtered at the Zaria abattoir. Prior to slaughter, the animals were subjected to antemortem examination and certified healthy, followed by a postmortem check before sampling. The urinary bladders were tied to retain the urine and each sample was wrapped in a polyethylene bag and conveyed soon afterwards to the laboratory in a cold recipient.

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Isolation

The samples were promptly examined in the laboratory whereby urine was aspirated from the urinary bladders, using sterile syringes and needles, after disinfection of the site of puncture. The urine color was noted and poured into sterile capped centrifugation tubes and centrifuged at 2000 rpm for 10 min. The supernatant solution was discarded and urinary sediments were inoculated on 7% defibrinated ovine blood agar (BA) and phenylethylalcohol agar (PEA) containing ovine blood.

One pair of each sample were incubated aerobically and anaerobically, respectively, at 37°C for 24-72 h and examined for bacterial growths. Pure colonies were obtained by subculturing on BA plates. Smears from the bacterial growths were stained by the Gram technique for identification of cellular morphologies.

Identification

The isolates were identified by standard diagnostic methods as described elsewhere (5, 8).

■ RESULTS

Bacteria were isolated from 17 (42.5%) of the samples examined and 23 (57.5%) had no bacterial growths. The most prevalent bacterial isolate was *Staphylococcus aureus* detected in 9 (22.5%) samples. Other isolated bacteria are shown in table I.

Urine samples from 16 (40%) of the cattle had a cloudy appearance and 24 (60%) were clear and normal. Out of the cloudy urine samples, 11 (68.8%) had no bacterial growths.

Table I

Bacteria isolated from urinary bladders of 40 slaughter cattle

Bacteria	Num. of infected cattle	Prevalence (%)
Corynebacterium renale	5	12.5
Corynebacterium pseudotuberculosis	1	2.5
Escherichia coli	1	2.5
Micrococcus sp.	2	5.0
Neisseria sp.	1	2.5
Pasteurella multocida	1	2.5
Proteus sp.	1	2.5
Sarcina sp.	1	2.5
Staphylococcus albus	3	7.5
Staphylococcus aureus	9	22.5

■ DISCUSSION

Staphylococcus aureus, the most prevalent bacterial isolate in this study, has been reported earlier from voided urine with a lower prevalence of 5.2% (1) and a higher prevalence of 31% (11).

The prevalence of *C. renale* isolated in this study is in agreement with the 10.5% prevalence obtained by El-Said (11). Although *C. renale* is the major cause of bovine pyelonephritis (6, 14), the isolates in this study were from apparently healthy cattle. However, Addo and Dennis isolated the organism from an infected kidney (1). Clinically normal "carrier" cows have been reported to be and probably are a source of infection (6). Bacteriuria has been established to occur in the absence of symptoms or pyuria that are subsequently signs of a urinary infection. Also, there is good evidence of a frequent association between asymptomatic bacteriuria and pyelonephritis (10).

Some bacteria, including *C. pseudotuberculosis, Escherichia coli* and *S. aureus* which can cause pyelonephritis in cattle, alone or with *C. renale* (6), have been isolated in this study. *Proteus* sp., that is commonly associated with urinary tract infections in small animals (9) and was found in the prepuce of bulls (13), has been identified in this study. *Sarcina* sp,. isolated from the urinary tract of stallions (15), has also been detected. This organism is occasionally associated with postoperative complications of the genitourinary tract (5).

The absence of bacterial isolates in some cloudy urine samples examined suggests nonbacterial causes. Both pathologic and nonpathologic causes of cloudy urine have been mentioned (9). However, the cloudiness encountered in the present study was uniformly opalescent, suggesting bacterial causes. Furthermore, studies have shown that pathogenic mycoplasmas have been isolated from urogenital tracts of local and exotic cattle in Nigeria. *Mycoplasma bovigenitalium* has been isolated from semen of bulls and vaginal swabs from cows (3, 4). Similarly, the occurrence of *Ureaplasma urealyticum* in cattle urogenital tracts has been reported (2).

■ CONCLUSION

This study, which aimed at redressing the inadequacy of reports on bacterial flora of cattle urinary tracts in Nigeria, revealed the presence of bacterial isolates associated with urogenital infections in cattle, *Corynebacterium renale*, the specific cause of bovine pyelonephritis, included. Further studies are needed to determine the nonbacterial causes of cloudy urine found in this study.

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Résumé

Fatihu M.Y. Flore bactérienne de la vessie urinaire chez des bovins à Zaria, Nigeria

Les auteurs ont rendu compte de la flore bactérienne de la vessie urinaire chez 40 bovins abattus à l'abattoir de Zaria au Nigeria. Dix isolats bactériens ont été identifiés. *Staphylococcus aureus*, avec une prévalence de 22,5 p. 100 était l'isolat le plus fréquemment rencontré. Parmi les échantillons examinés, 16 (40 p. 100) avaient une apparence trouble et, parmi ces derniers, 11 (68,8 p. 100) n'avaient pas de croissances bactériennes. *Corynebacterium renale* a été isolé chez 5 (12,5 p. 100) bovins bien qu'il n'y ait pas eu de signe apparent de maladie ni de pyélonéphrite.

Mots-clés : Bovin - Zébu - *Staphylococcus aureus* - *Corynebacterium renale* - Vessie - Nigeria.

Resumen

Fatihu M.Y. Flora bacteriana en la vejiga urinaria del ganado en Zaria, Nigeria

Se reporta la flora bacteriana de la vejiga urinaria de 40 bovinos sacrificados en el matadero de Zaria, en Nigeria. Se identificaron diez aislamientos bacterianos. El más frecuente fue *Staphylococcus aureus*, con una prevalencia de 22,5%. Dieciséis (40%) de las muestras de orina examinadas tenían una apariencia turbia y 11 (68,8%) de éstas no presentaron ningún crecimiento bacteriano. *Corynebacterium renale* se aisló en 5 (12,5%) animales, incluso en ausencia de enfermedad aparente o pielonefritis.

Palabras clave: Ganado bovino - Cebú - *Staphylococcus aureus* - *Corynebacterium renale* - Vejiga - Nigeria.