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RESEARCH PAPER

BACTERIAL FLORA IN THE URINARY BLADDER OF APPARENTLY HEALTHY CATTLE IN MAIDUGURI, BORNO STATE, NIGERIA

*[1]Egbe-Nwiyi T.N., *[2]Luka J. and [1]Ngadda R.H.*

[1]Department of Veterinary Pathology; [2]Department of Veterinary Microbiology and Parasitology; Faculty of Veterinary Medicine, University of Maiduguri, Maiduguri - Nigeria.

***Corresponding Author:** joshuadiriki@yahoo.com

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ABSTRACT

Fifty apparently healthy adult cattle presented for slaughter at the Maiduguri Metropolitan Abattoir were examined to determine the bacterial flora in the urinary bladder. Isolation and identification of the isolates in the aseptic urine samples from the urinary bladder were done according to standard bacteriological techniques. All the animals examined were positive for one bacterial isolates or the other. *Proteus* (30.0%) and *Escherichia coli* (30.0%) were the most common bacterial isolates. Other bacteria were *Salmonella* species (20.0%), *Shigella* species (14.0%) and *Klebsiella* species (6.0%). The isolates though from apparently healthy animals could be of health and epidemiological significance

Key Words: Bacterial flora, Bladder, Cattle, Maiduguri.

INTRODUCTION

All animals have a large population of microorganisms that are considered normal flora (Summer, 2003). Bacterial flora of the urinary bladder refers to organisms that are normal inhabitants of the urinary bladder and may be present in health and disease condition (Fatihu, 1997; Yeruham *et al.*, 2006). Bacteria frequently gain entrance to the urinary bladder but are removed by the flushing action of voided urine before they invade the mucuosa (Radostits *et al.*, 1994). These organisms usually enter the bladder by ascending the urethra, but descending infection from embolic nephritis may occur (Radostits *et al.*, 1994). Sporadic inflammation of the bladder may occur due to introduction of infection into the bladder or when trauma to the bladder occurs (Radostits *et al.*, 1994). The occurrence of pyelonephritis which changes the bacterial flora of Cattle especially cows have earlier been reported (Braun *et al.*, 2007; Divers and Peek, 2008) with Escherichia coli and *Corynebacterium renale* being the most commonly incriminated organisms.

Bacterial flora of the urinary bladder of cattle in other parts of Nigeria has been reported (Fatihu, 1997; Ogunshe *et al.*, 2008). In view of this, the present study was designed to determine the bacterial flora of apparently healthy cattle presented for slaughter at the Maiduguri Abattoir.

MATERIALS AND METHODS

Study Area: This study was conducted in Maiduguri, the capital of Borno State. It lies in the semi arid zone of North-Eastern Nigeria where the rainy season is of short duration (between 3 - 4 Months) and a long dry season for the rest of the year (Molta *et al.*, 1998; 1999).

Drought is endemic and rainfall have shown a declining trend since the 1960s in the Sahel and Northern Sudan Savannah thereby making livestock within the region to depend on vegetation consisting mainly of acacia trees and other plants that can withstand the harsh environment for their feed (Molta *et al*., 1998-1999).

Study Duration: This study was conducted from March – August, 2011.

Study Animals: All the animals used in this study were trade stocks from nomadic herds presented for slaughter at the Maiduguri Metropolitan Abattoir. Ante mortem inspection was carried out according to standard procedures (Gracey, 1986) and all such animals that passed the ante mortem inspection were classified as apparently healthy. These animals were housed at the lairage of the abattoir for between 24 - 48 hours without access to food or water preparatory to slaughter.

Sample Collection: Fifty intact urinary bladders of cattle were aseptically obtained from randomly selected cattle of both sexes presented for slaughter. These were tied in sterile polythene bags and immediately transported to the Microbiology Laboratory of the Department of Veterinary Microbiology and Parasitology, University of Maiduguri.

Samples and Data Analysis: Urine samples were aseptically aspirated from the urinary bladder using sterile syringe and needles after disinfection of the site of puncture (Fatihu, 1997). The urine samples were then inoculated on to already prepared media according to manufacturer's instructions (International Diagnostics Group Plc, Lancashire, and U.K).

The inoculated samples were then incubated aerobically at 37^0C for 24 hours after their colonial appearance were examined (Jones, 1994; Yeruham et al., 2004). Morphological characterization of the isolates were done by Gram staining technique and then identified according to criteria described by (Jones, 1994). Pure cultures were obtained by sub-culturing colonies severally on freshly prepared secondary media. The following biochemical tests were performed according to the method described by (Jones, 1994); Grams reaction, indole test, Methyl red test, Voges Proskauer test, Simon's citrate test, Urea test, fermentation of lactose, Sucrose, D-mannitol, Dulcitol and D-sorbitol.Motility test was carried out according to standard procedure (HPA, 2010).

The data generated from this study was analysed using simple descriptive statistics

RESULTS

The results on bacterial flora in the urinary bladder of the cattle under study are as presented in *Table* I. All the cattle sampled were positive for one or more bacterial isolates as shown in *Table* 1; giving an overall prevalence of 100%. *Escherichia coli* and *Proteus spp* were the most prevalent, while *Klebsiella spp* was the least isolated organism.

Reactions of the various isolates to different biochemical tests are presented in *Table* 2. All the isolates except *Shigella spp* were positive, negative or variable in their reactions. *Shigella* isolates however, showed either negative or positive reaction patterns.

Table I: Bacteria isolated from urine obtained from urinary bladder of 50 slaughtered cattle in Maiduguri Abattoir

Bacteria	No of samples	No of cattle infected	Prevalence (%)
Escherichia coli	15	15	30
Proteus spp	15	15	30
Salmonella spp	10	10	20
Shigella spp	7	7	14
Klebsiella spp	3	3	6
Total	**50**	**50**	**100**

Table 2: Results of the various biochemical tests carried out on the isolates

Biochemical tests	Bacterial isolates				
	Escherichia coli	***Proteus Spp.***	***Klebsiella Spp.***	***Salmonella Spp.***	***Shigella Spp.***
Grams reaction	-	-	-	-	-
Indole	+	-	+	-	-
Methyl red	+	+	V	+	+
Vogues Proskauer	-	V	+	-	-
Simmon's citrate test	-	V	+	V	-
Urea	-	V	+	-	-
Motility	V	+	-	+	-
Lactose	+	-	+	-	-
Sucrose	V	+	+	-	-
D-Mannitol	+	-	+	+	+
Dulcitol	V	-	V	V	-
D-sorbitol	V	-	-	-	-

Key: Positive (+), Negative (-), Variable (v).

DISCUSSION

Available literatures showed that bacterial flora of the urinary bladder has been studied in both healthy (Fatihu, 1997) and diseased cattle (Yeruham *et a*l., 2004; Yeruham *et al*., 2006). Of interest, is the fact that an overall bacterial prevalence of 100% was observed in this study. This contradicts the 42.5% reported by Fatihu (1997) in Zaria and the 84.6% reported by Ogunshe et al., (2008) in Ibadan and Abeokuta; suggesting a geographical variation in the order of low, high, and higher, for Zaria, Ibadan/Abeokuta and Maiduguri respectively.

The higher prevalence in this study as compared with previous works (Fatihu, 1997; Ogunshe et al., 2008) may, among other factors, be due to the extreme low rainfalls usually experienced in Maiduguri and the type of pasture and husbandry practices in the given geographical location. More so, animals starved of water for some period of time may witness ascension of urethral flora or descent of kidney flora to the bladder (Radostits *et al*., 1994). Some pastures and fodders are known to favour stasis of microorganisms which ordinarily would have been voided along with urine (Radostits *et al*, 1994).

The result of this study shows also that of the total isolates, *Escherichia coli* and *Proteus spp* shared an equal percentage value of 30.0%. This is comparatively higher than the equal percentage value of 2.5% reported by Fatihu (1997) in Zaria. However, the organisms isolated in this study were similar to those isolated by Ogunshe *et al*. (2008) in addition to *Bacillus spp, Staphyloccoccus spp, Citrobacter spp and Shigella spp*.

In conclusion, *E-coli, Proteus spp, Salmonella spp, Shigella spp* and *Klebsiella spp* appear to be the most prevalent bacterial flora in the bladder of apparently healthy cattle in Maiduguri. It is our opinion therefore, that similar studies be carried out on different species of animals under the same and/or different management conditions to generate baseline data for flora in the urinary bladder of animals.

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AUTHORS' CONTRIBUTIONS

Dr. Egbe-Nwiyi T.N. was responsible for design of the work and supply of some literary materials. Dr. Luka J, was responsible for Manuscript preparation, search for literary materials and supervision of some laboratory procedures. Dr. Ngadda R. H, helped in sample collection and submission to the laboratory.