

DIAGNOSIS OF URINE INFECTION BY ABST, CULTURE METHODS AND TREATMENT IN AN ASIAN ELEPHANT (*ELEPHAS MAXIMUS*)

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Abstract: A 57-yr-old female Asian elephant (*Elephas maximus*) named Rani housed at SV Zoological Park, suffering with anorexia, restlessness, and urinary tract infection was passing yellowish tinged cloudy urine. Urine analysis showed haematuria, leukocyturia, granular casts, and none of calcium oxalate crystals were found. Urine culture revealed the growth of *Streptococcus*, *Proteus* and *E.coli*. After conducting ABST the organisms were found sensitive to gentamycin and resistant to rest of the antibiotics. A presumptive diagnosis was made based on urinalysis, and urine culture.

Key words: Hematuria, Asian elephant, *Elephas maximus*, pyelonephritis, calcium oxalate crystals.

Introduction:

Most of the captive elephants in India (*Elephas maximus*) are nulliparous and aged and many of them have urinary tract infections and endometrial diseases (Carlos R. Sanchez et al,

2004). The elephants roam freely in fenced wild life Zoo. The herd of elephant is sometimes fed with supplements and is habituated to visitors who try to feed them by hands. On the contrary these elephants remain wild and aggressive kick if sloppily approached. Urinary tract infection refers to a condition in the urinary bladder (sometimes also involving kidneys) caused by infection, usually with bacteria. In most studies, UTI's have been found in female animals more often than in males, and older animals have been thought by some investigators to be at increased risk of UTI's (Cengiz, C et al, 2003). The bladder stones, tumors of bladders, nervous system problems and medications (Cortisone drugs, anticancer drugs) may predispose animals to Urinary tract infections (Divers, T. J. 2002). A presumptive diagnosis of UTI is based on clinical and urinalysis findings, but urine culture is required to conclusively diagnose UTI. Various microorganisms may be involved in the etiology of UTI in animals. *Escherichia coli*, *Proteus Spp*, *Pseudomonas Spp*, *Staphylococcus Species* and *Streptococcus Species* are the most common infecting bacteria. Infection with single bacterial species is more prevalent than mixed infections. Successful management of the urinary tract infection in elephants is a rare occurrence. The aim of the study was to determine the frequency and antibiotic sensitivity patterns of bacterial pathogens isolated from elephant urine suffering with Urinary tract Infections (UTI) (Divers, T. J. 2002).

Materials and methods

Clinical case progression:

On 25th September, 2012, A 57 year old female elephant named Rani (*Elephas maximus*), from Sri Venkateswara Zoological Park (SVZP), Tirupati was reported to have shown signs of Pyrexia, restlessness, urinary tract infection and passing yellowish tinged white cloudy urine. The animal was mildly dehydrated based on dry mucous membranes, thick saliva, pyrexia

was noted. A clean free-catch mid stream urine sample was sent to Department of Microbiology, College of Veterinary Science, Tirupati for conducting antibiotic sensitivity test and culture examination.

Urinalysis

The physical properties of the urine were examined. Urine pH, Proteinuria, glucosuria, ketonuria, bilirubinuria, urobilinogen, nitrite and urine specific gravity levels were evaluated by Lipstick test (Lapstrip). Proteinuria was in addition checked by sulfosalicylic test. Urine samples were centrifuged at 3000 rpm for 3 min. Urine sediment examination was made to evaluate RBC, WBC, epithelial cell casts and crystals in centrifuged urine.

Bacteriological examination

On Gram staining of urine culture revealed the presence of both Gram positive streptococci and gram negative bacteria. The sample was re-inoculated into Edwards medium and Mac-conkey agar. Lactose (pink) and non lactose fermentors (Colour less) colonies were observed on Mac-conkey agar. Lactose fermentors were inoculated into EMB agar and non lactose fermentors were inoculated into XLD and BGE agar. The sample was subjected for Antibigram test using different antibiotics. The isolated bacteria were identified on the basis of cultural, morphological and biochemical characteristics. Antibiotic sensitivity was performed using the dick diffusion method (Bauer, A.W. et al, 1996) with the following antibiotics. Gentamycin (30mcg), Penicillin (10 units), Enrofloxacin (10mcg), Ceftriaxone (30mcg), Cefataxim (30mcg), Ampicillin (0mcg) and Amoxycillin (10mcg).

Results

Clinical examination:

The elephant became partially pyrexia and restless and began to pass Cloudy urine. The animal was mildly dehydrated based on dry mucous membranes, thick saliva. The elephant

consumed hay but refused concentrates and showed no interest in extra oral fluids depressed and weak and spent much of its time leaning against a wall. Moderate dehydration was noted.

Urinalysis

A clean free-catch urine sample revealed hematuria with moderate leukocyturia, although no intracellular bacteria were seen. Urine sediment cytology revealed numerous red blood cells (RBCs), prominent cellular casts containing neutrophilic and epithelial cell remnants, and a notable lack of the calcium oxalate crystals normally found in elephant urine. Urinalysis showed hematuria with mild leukocyturia (1–3 white blood cells [WBC] /high-power field), isosthenuria (sp. gr. 5 1.009; normal 5 1.016–1.023), (Table: 1) proteinuria and numerous granular casts containing WBCs, RBCs.

Bacteriological examination

Bacteria were isolated from the urine sample and appear to be mixed infection. The organisms were isolated in pure cultures. A total of three strains were isolated. They are *Escherichia coli*, *Proteus mirabilis*, *Streptococcus* Spp. The cultural and biochemical characteristics were presented in Fig. 1. Of this three strains *E.coli* was found sensitive to Enrofloxacin, *Proteus* was sensitive to Gentamycin and *Streptococcus* was sensitive to penicillin, as a whole, the organisms were sensitive to Gentamycin.

DISCUSSION:

The elephant had been in captivity for several months

The combination of history, clinical signs, physical examination and urinalysis led to a presumptive diagnosis of pyelonephritis (Hodgson, D. R. 1987). Profound lethargy and depression associated with azotemia, low urine specific gravity, and urinary casts with neutrophils were indicative. Although a kidney biopsy technique for a juvenile African elephant

exists, 10 this procedure was considered too invasive given the previous diagnostic information and positive response to treatment. The culture isolation of a multiple species of *Streptococcus*, *proteus* and *E.coli* suggests that infection is consistent with acute renal damage associated with urinary tract infection rather than drug-induced nephrotoxicity. An ascending bacterial infection from the lower urinary tract may have initiated pyelonephritis.

Table: 1. Shows the Urine analysis of Elephant sample by Urine test Strip method (IVD):

S.No	Name of the Test	Result
1.	Urobilinogen	Normal
2.	Bilirubin	17+ $\mu\text{mol/L}$
3.	Ketone	Negative
4.	Blood	Haemolysed ca10+
5.	Protein	Negative
6.	Nitrite	500+++ leuko/ μm
7.	Leukocytes	250++mg/dl
8.	Glucose	Negative
9.	Specific gravity	1.005
10.	P ^H	7.5

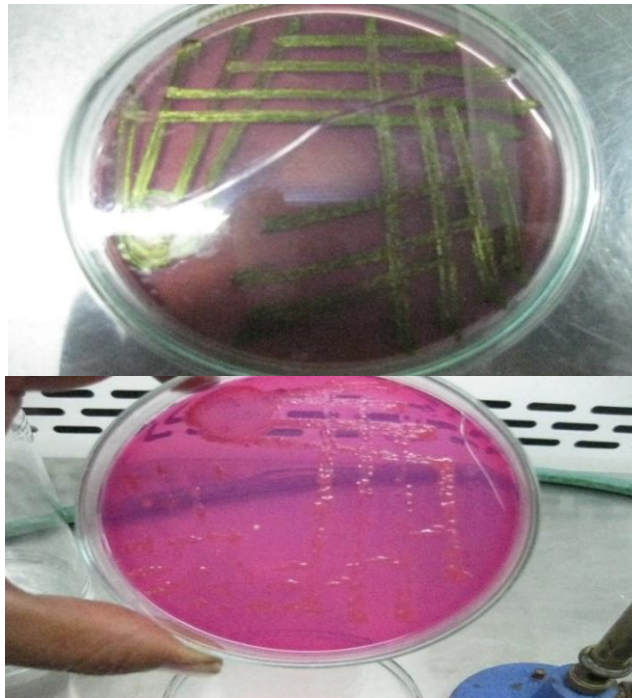


Fig.1: strains isolated *Escherichia coli*, *Proteus mirabilis*, *Streptococcus* Spp. By Edwards medium and Mac-conkey agar. Lactose (pink) and non lactose fermentors (Colour less) colonies were Observed on Mac-conkey agar. Lactose fermentors were inoculated into EMB agar and non lactose fermentors were inoculated into XLD and BGE agar.

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