

Indwelling J Ureteral Stents Associated Asymptomatic Bacteraemia Caused by Multidrug Resistant Strain of *Kocuria kristinae*

MUHAMMED A.P. MANZOOR¹, K.S SHABEENA², M MUJEEBURAHIMAN³, ALTAF KHAN⁴

ABSTRACT

Kocuria kristinae is a Gram positive non pathogenic bacterium belonging to the family of micrococcaceae. It may cause opportunistic infections in patients with indwelling devices and severe underlying diseases. Indwelling double J ureteral stent is commonly used in urological practice and bacterial colonisation in the ureteral stent plays an important role in the pathogenesis of stent associated infection. Here, we report a rare case of bacteraemia by *Kocuria kristinae*. Antimicrobial susceptibility testing was performed by Kirby Bauer disc diffusion method. The isolate were found to be multidrug resistant. Regular surveillance of drug resistance is of utmost importance to minimise the spread of infections.

Keywords: Antimicrobial susceptibility, Renal stones, Ureteroscopic lithotripsy

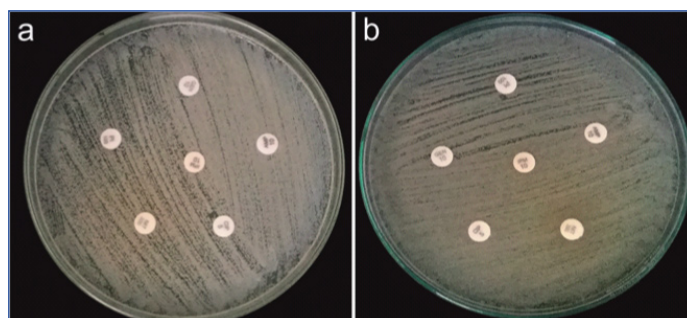
CASE REPORT

A 46-year-old male patient presented to the Urology Department with right flank pain radiating to the right lower quadrant since four weeks. The patient did not report fever or bowel and bladder dysfunction. The patient had a similar pain in the right flank five years ago and it was diagnosed as renal stones, and the patient had not underwent any treatment or conservative management. No history of urolithiasis was recorded in the family. The patient underwent a baseline assessment including a detailed medical history, physical examination, urinalysis, complete blood examination, renal function test, ultrasound and X-ray of Kidney, Ureter and Bladder (KUB). The blood examination showed neutrophils 78%, lymphocytes 13%, monocytes 8% and eosinophils 1%. The biochemical parameters were in normal range. Other investigations such as total protein 7.8 mg/dL, serum albumin 3.7 mg/dL, serum globulin 3.9 mg/dL and albumin globulin ratio 0.9 mg/dL. All the other blood parameters were normal. The preoperative urine analysis showed negative urine culture. The urine appeared pale yellow. Pus cells, red blood cells and albumin were absent in urine and urine pH was 6.24. No evidence of casts and crystals were found. Ultrasound KUB showed right 9x6 mm Pelvi Ureteric Junction (PUJ) calculi.

The patient received prophylactic antibiotic levofloxacin (500 mg) for five days orally before the procedure. Ureteroscopic lithotripsy was performed and stent was inserted. Stent made of polyurethane was inserted retrograde endoscopically under fluoroscopic guidance. The post operative urinalysis showed no evidence of bacteria. The duration of stenting was 15 days and the stent was removed in the operating room under aseptic conditions. After the stent removal, 1 to 3 cm of the tip located in the bladder was cut aseptically and immediately inoculated into MacConkey agar and incubated aerobically at 37°C for 18 to 24 hours. After incubation, each separate morphological colony type was counted using a digital colony counter. Gram staining of the culture revealed the cells to be Gram positive cocci.

The bacteria were identified using Phoenix 100 automated system (BACTEC 9120) [1]. All the specimens were handled according to the clinical microbiology laboratory standard operating procedures. Antimicrobial susceptibility testing was performed using Kirby Bauer disc diffusion method on Muller Hinton agar using commercial

antimicrobial disks [Table/Fig-1]. The results were expressed as Susceptible (S), Intermediate (I), or Resistant (R) according to the criteria of the clinical laboratory standards. Eighteen antibiotics with a broad range of mechanisms of action, including drugs that target cell wall, nucleic acid and protein were selected [Table/Fig-2]. The isolate was found to be resistant to all the tested antibiotics. The patient was discharged in satisfactory condition and follow-up was done for six months.



[Table/Fig-1]: Drug sensitivity pattern of *Kocuria kristinae* showing resistance to antibiotics.

DISCUSSION

Kocuria is a Gram positive coccoid bacteria belonging to phylum Actinobacteria that are catalase positive and coagulase negative [2]. These bacteria are normally found in the skin and mucosa of humans and are rarely seen in clinical specimens. However, it may cause opportunistic infections in patients with indwelling devices and severe underlying diseases [3]. In addition, knowledge concerning the properties associated with *Kocuria kristinae* is limited [4]. However, reports showed that *Kocuria kristinae* can also be associated with the cases of catheter associated bacteraemia which was caused by this species in chronically ill patients [5-7]. As the use of indwelling ureteral stents has increased, the stent associated infection has also become more frequent. However, no case of an indwelling J ureteral stent infection with *Kocuria kristinae* has been reported. Present patient was treated for ureteric calculi and implanted with a J ureteral stents, which can be correlated somewhere with the association between indwelling devices and *Kocuria kristinae*. Here, we describe a case of indwelling J ureteral

Abbreviation	Antibiotic	Concentration (mcg)	Class	Main mechanism of action
AMK	Amikacin	30	Amioglycoside	Protein synthesis
AMP	Ampicillin	10	Aminopenicillin	Cell wall synthesis
GEN	Gentamycin	10	Amioglycoside	Protein synthesis
VA	Vancomycin	30	Glycopeptide	Cell wall synthesis
IPM	Imipenem	10	Carbapenem	Cell wall synthesis
AZM	Azithromycin	15	Macrolide	Protein synthesis inhibitors
NA	Nalidixic acid	30	Quinolone	Cellular deoxyribonucleic acid
E	Erythromycin	15	Macrolide	Protein synthesis
OX	Oxacillin	1	Penicillin	Cell wall synthesis
PIP	Piperacillin	100	Ureidopenicillin	Cell wall synthesis
TET	Tetracycline	30	Polyketide	Protein synthesis
CPR	Ciprofloxacin	5	Fluoroquinolone	Gyrase
CTX	Cefotaxime	30	Cephalosporin	Cell wall synthesis
CD	Clindamycin	2	Lincomycin	Protein synthesis
TOB	Tobramycin	10	Aminoglycoside	30S and 50S ribosome
P	Penicillin G	10	Penicillin	Cell wall synthesis
NIT	Nitrofurantoin	300	Nitrofuran	Deoxyribonucleic acid
CEP	Cefepime	30	Cephalosporin	Cell wall synthesis

[Table/Fig-2]: List of all antibiotics used in the study.

stent bacteraemia due to *Kocuria kristinae* in an adult man with right PUJ calculi. Antibiotic susceptibility testing was performed by Kirby Bauer disc diffusion method.

Understanding the microorganisms involved in the stent colonisation and their sensitivity profile will help in better treatment regime. Present patient's isolate was found to be highly resistant to all the drugs as determined by disk diffusion method. The isolate was found to be resistant to various classes of antibiotics including penicillins, ureidopenicillin, amioglycosides, cephalosporins, and fluoroquinolones etc. However, the previous reports showed that *Kocuria kristinae* were susceptible to many commonly used antibiotics, including penicillins, clindamycin, vancomycin and fluoroquinolones [5,8].

Kocuria kristinae infections and its clinical spectrum will become clearer in near future with more reports [3]. Multidrug resistant bacteria are a major concern and therefore, precautions should be taken against it. Regular disease surveillance and rapid diagnostics to cut unnecessary use of antibiotics will be necessary in this regard.

With the high incidence of kidney stones and other urological diseases in our population there is an increased need for ureteral stent placement [9,10]. As the use of indwelling ureteral stents has increased, the stent associated infection has also become more frequent [11]. Bacterial colonisation in the stent plays an important role in the pathogenesis of stent associated bacteraemia.

CONCLUSION

Kocuria kristinae associated clinical infections are an emerging health concern and further care should be taken for proper administration of antibiotic treatment as they are intrinsically multidrug resistant.

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PARTICULARS OF CONTRIBUTORS:

1. Senior Research Fellow, Department of Urology, Yenepoya Research Centre, Yenepoya University, Mangalore, Karnataka, India.
2. Research Scholar, Yenepoya Research Centre, Yenepoya University, Mangalore, Karnataka, India.
3. Professor, Department of Urology, Yenepoya University, Mangalore, Karnataka, India.
4. Associate Professor, Department of Urology, Yenepoya University, Mangalore, Karnataka, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Mr. Muhammed A.P. Manzoor,
Senior Research Fellow, Department of Urology, Yenepoya Research Centre,
Yenepoya University, Seed Grant (YU/Seed grant/2011-019), Deralakatte, Mangalore-575018, Karnataka, India.
E-mail: manzoorapky@gmail.com

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