

# *Kocuria Kristinae* in Catheter Associated Urinary Tract Infection: A Case Report

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## ABSTRACT

*Kocuria kristinae* is a gram positive coccus of the family of *Micrococcaceae*. It inhabits the skin and mucous membranes, but it has rarely been isolated from clinical specimens and is thus considered to be a non-pathogenic commensal. However, it may cause opportunistic infections in patients with indwelling devices and severe underlying diseases. We are reporting an unusual case of a *Kocuria kristinae* urinary tract infection in a catheterized, 20-years old male. To the best of our knowledge, this is the first reported case of a catheter related urinary tract infection which was caused by *Kocuria kristinae*.

**Key words:** *Kocuria kristinae*, Catheter, Infection

## INTRODUCTION

*Kocuria spp.* were previously classified as the members of *Micrococcaceae* family. They have now been removed from the genus, *Micrococcus* and have been reclassified as *Kocuria*, based on their phylogenetic and chemotaxonomic analyses [1]. *Kocuria spp.* are widely distributed in nature and they are also found frequently as normal skin flora in humans and other mammals. *Kocuria kristinae* is a facultative anaerobe and a non-motile, catalase-positive, coagulase-negative and a gram-positive coccus which is arranged in tetrads. Documented cases of infections which were caused by *Kocuria spp.* are limited. Most of the infections have been detected in hospitalized patients with severe underlying diseases or who had indwelling devices or implants or suppressed immunity. Like other *Kocuria spp.*, *K. Kristinae* was not considered to be a primary pathogen, but during recent years, well documented cases of catheter related bacteraemia which was caused by this species in chronically ill patients [2-4], in pregnant females (with no other medical history) [5], in cases of peritonitis (which was related to peritoneal dialysis) [6-7] and in a case of acute *cholecystitis* [8] have been reported. We have not come across any report of UTIs which were caused by *K. kristinae* from India so far.

## CASE PRESENTATION

A 20-years old male was admitted in Unani IPD with inability to pass urine and severe lower abdominal pain which were present since the past one day. There was no history of fever. He was investigated and diagnosed as a case of urethral stricture.

A suprapubic cystostomy was performed and a catheter was implanted, to aid free flow of urine. The next day, he was discharged, along with the catheter. Seven days later, he returned to the hospital, complaining about having to strain himself for passing stools and leakage of few drops of urine with lot of burning and pain during passage of stools.

There was no history of fever, but patient complained of malaise and weakness. On physical examination, his condition was found to be satisfactory. His haemogram was normal. Urine which was drained from catheter was sent for routine, culture and sensitivity testing. On microscopic examination, 15–20 pus cells per high power field were reported.

The sample was inoculated onto sheep blood agar and Mc Conkey's agar plates and the plates were incubated overnight at 37°C. Tiny, pale, non-haemolytic, smooth and convex colonies were seen

on blood agar, whereas no growth was observed on McConkey's agar. Gram staining of the colonies revealed the presence of *gram positive cocci* which were mostly arranged in tetrads. The organism which was grown was catalase positive, coagulase weakly positive and non motile.

An antibiotic sensitivity test was performed on Muller Hinton Agar by Kirby Bauer disc diffusion method according to Clinical and Laboratory Standards Institute (formerly NCCLS) guidelines for *Staphylococcus* [9].

The isolate was found to be resistant to penicillin, erythromycin, trimethoprim/sulfamethoxazole, ceftazidime, ceftriaxone, gentamicin, amikacin, oxacillin, ciprofloxacin, meropenem, imipenem, amoxicillin with clavulanate and vancomycin. Isolate was reprocessed by using the VITEK 2 Compact (bioMerieux) automated identification system and it was confirmed as *K. kristinae* (see report).

## DISCUSSION

The frequent use of indwelling devices, implants which are used in patient care and an increase in number of immunocompromised patients have given rise to infections which are caused by organisms which are otherwise not considered as primary pathogens. *Kocuria kristinae*, which frequently colonizes the skin, mucosa and human oropharynx and is generally isolated from a wide variety of animal sources and soil [1-3], can cause severe infections, mainly in hospital settings. They have been found to be responsible for causing endocarditis and central venous catheter-related bacteraemia in patients with ovarian cancer [2,3] and acute leukaemia [4] and in pregnant females [5]. Apart from bacteraemia, reports of *cholecystitis* in immunocompetent hosts, as well as dialysis related peritonitis [6-8] have also been documented. So far, no case of a urinary tract infection with *Kocuria kristinae* has been reported. Our patient was a healthy adult, except that he was implanted with a catheter, which can be correlated somewhere with the association between indwelling devices and *K. kristinae*.

In the reported cases of *K. kristinae* infections so far, the organisms were reported to be susceptible to many commonly used antibiotics, which include penicillins, macrolides, clindamycin, trimethoprim/sulfamethoxazole, vancomycin and fluoroquinolones [2,3,8]. A literature report on 219 strains of *Kocuria and Micrococcus* showed that a majority of strains were sensitive to doxycycline, ceftriaxone, cefuroxime, amikacin, and amoxicillin with clavulanic acid, but resistant to ampicillin and erythromycin [10]. In another case,

*K. kristinae* was found to be sensitive to ceftazidime, ceftriaxon, cefotaxim, cefpodoxim proxetil, gentamycin, amikacin, netilmicin, norfloxacin, ofloxacin, ciprofloxacin, meropenem, imipenem, ertapenem, ceftazidim with clavulanate and vancomycin, but to be resistant to amoxicillin. Although, till now, *K. kristinae* has been documented to be sensitive to many antibiotics, our isolate was found to be highly resistant to all the drugs by disk diffusion method. As our patient was admitted to Unani IPD and as he was on Unani syrups (Septran, etc), but was not getting any relief, antibiotic sensitivity was performed. Antibiotics can be tried in Unani patients, but our strain was resistant to all the drugs which were tested. Antibiotics were not started. Patient did not visit the hospital for follow up. Unfortunately, we have no idea of outcome of that patient. Generally, the infections which are caused by this species are very rare, but they could be recognized certainly by modern highly automated identification systems [5]. There are reports on erroneous identifications of coagulase-negative *Staphylococci* as *Kocuria spp.* by the VITEK 2 system due to its phenotypic variability [9]. Due to lack of facilities, we did not confirm our isolate of *K. kristinae* by genotyping. We believe that modern VITEK 2 compact automated system with a GP card which was covered by the corresponding database, was quite a reliable tool for identification of *Kocuria kristinae* in our patient [11].

Although, it was previously considered as a harmless micro-organism, many reports have described the association of this organism with severe infections. Also the changing clinical spectrum of *K. kristinae* from immuno-compromised to immuno-competent patients and change in its antimicrobial susceptibility towards resistance to many drugs is a matter of concern and it should be tackled by making sincere efforts. Physicians should

not underestimate importance of *K. kristinae* if it is isolated in lab in any clinical specimen. In near future, with more reports coming in, its clinical spectrum will become more clear.

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