

# Kocuria species reporting - microbiologists dilemma

## Abstract

Kocuria species have been reported as emerging human pathogens in recent times. It is mostly seen in compromised hosts with severe underlying disease. Increased reporting is most likely due to the availability of automated /better identification methods and may not be due to actual increase in incidence. However increased isolation and publication of case reports of their isolation has added to confusion in microbiology reporting. We are one of the largest tertiary care and teaching Institute in Asia and have isolated Kocuria species from Chronic liver disease patients. Sepsis and peritonitis caused by *Kocuria* species in our cases yielded identical Kocuria isolates from the peritoneal dialysate fluid within a period of six weeks. The infection was subsequently resolved by antibiotic treatment and catheter removal. On review of literature we found that the majority of cases were device-related, acquired in the hospital or endogenous and different Kocuria species appear to share a common etiology of peritonitis. Disease burden associated with Kocuria appears to be under reported. There are no specific treatment guidelines as yet for diseases associated with Kocuria not only at our Institute but also in majority of Institutions in India

**Keywords:** microbiologists, *Kocuria* species, oxidase test, susceptibility, pathologies

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## Introduction

Organisms of the genus *Kocuria* (family Micrococcaceae, order Actinomycetales, class Actinobacteria) This bacterium was first identified and described by Miroslav Kosur, a Slovakian microbiologist. Currently, there are more than 18 species of *Kocuria* identified based on the 16S rRNA phylogenetic studies. The species of *Kocuria* identified thus far include *Kocuria assamensis*, *Kocuria aegyptia*, *Kocuria gwangalliensis*, *Kocuria atrinae*, *Kocuria carniphila*, *Kocuria flava*, *Kocuria palustris*, *Kocuria halotolerans*, *Kocuria himachalensis*, *Kocuria korensis*, *Kocuria kristinae*, *Kocuria marina*, *Kocuria polaris*, *Kocuria rhizophila*, *Kocuria rosea*, *Kocuria salsicia*, *Kocuria sediminis*, *Kocuria turfanensis*, and *Kocuria varians*. They are characteristically are gram-positive coccoid and aerobic (although some species like *Kocuria kristinae*, *Kocuria marina* and *Kocuria rhizophila* may proliferate in anaerobic conditions). Bacteria often found as tetrads and irregular clusters that are catalase-positive and coagulase-negative. These bacteria are responsible for different types of infection, mostly in immune compromised hosts with chronic underlying conditions.<sup>1,2</sup> These patients had mainly bacteremia/recurrent sepsis.<sup>2-7</sup> It is noticeable, however, that the immune compromise was not mandatory in all reported cases. However, the prevalence of human infections caused by *Kocuria* species is underestimated, as commonly used phenotypic assays are known to misidentify *Kocuria* isolates as *Staphylococci*.<sup>2</sup> Accordingly, a number of presumed staphylococcal pathologies might have been caused by *Kocuria* species, although it is plausible that a variety of presumed *Kocuria* infections might have actually been due to coagulase-negative *Staphylococci* (CoNS). We can use Susceptibility towards bacitracin and lysozyme and resistance to nitrofurantoin, furazolidone and lysostaphin can be used to separate this bacterium from *Staphylococci*. Modified oxidase test results differentiate between *Kocuria* spp (negative) and Micrococci.

Here, we report what we believe are first few cases of peritonitis caused by *Kocuria* species that were initially assumed to be due to CoNS. Though it is still early to say if we should report the infections associated with these bacteria, but as incidence is increasing hence, it is now important for us to enumerate the virulence and antibiotic

susceptibility patterns of these organisms and may report/ inform clinicians which may lead to improvement in the patient management. We report the first few cases of *Kocuria*, isolated from ascetic fluid samples from our institution.

## Method

We performed all culturing procedures according to the 2005 update of the International Society for Peritoneal Dialysis recommendations and guidelines using specimens collected prior to antibiotic treatment.<sup>3</sup> Pure culture was yielded after 48h of incubation at 35°C in 5% CO<sub>2</sub> on blood agar. The 1- to 2mm colonies were non hemolytic and yellow. On Gram staining:

1. Showed growth of gram positive cocci in pairs or clusters.

Bio Chemical reactions: The isolate were preliminarily identified with the help of bio chemical reactions such as

1. Catalase positive.
2. Oxidase negative.

Reduces nitrates to nitrites and growth in 5% NaCl and motility test negativity (4a). They were further identified as *Kocuria rosea* (99%) probability by a Vitek 2 system (4a).

## Antibiotic sensitivity

The isolates were susceptible to linezolid, vancomycin, clindamycin and resistant to trimethoprim/sulfamethoxazole, penicillin, tetracycline, chloramphenicol, ciprofloxacin, erythromycin, gentamicin. On literature search we found that similar case was cited by Dotis et al.<sup>5</sup> Narrow-spectrum cephalosporin (ceftezole) was started for empirical treatment, which was changed to intra peritoneal clindamycin when there was no response, Intravenous vancomycin was started. In some of the cases despite administration of intravenous vancomycin, the response remained unsatisfactory. Outcome of the treatment was dependent on the host response / immune status of the patient. We admit the lacunae of not been able to track the patient fully as ours is Government run Institution and patient generally do not come back for review if they get better or otherwise too. It

would be too early on our part to assume that isolated *Kocuria* sp was actually the cause of morbidity/mortality. However we are flagging the emergence of *Kocuria* species in chronic ailments / immunocompromised patients. Increases isolation could be due to automation too. Ubiquitous nature of this particular species further adds to the existing dilemma of reporting by Microbiologist to clinician. Source tracing may help us establish the cause but so far we could not trace the source of infection. Further elaborate study, especially the multicentric studies may help us in designing future course of action.

### Conflicts of interest

The authors declare that there is no conflict of interest.

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