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Unusual Pathogen- *Kocuria kristinae* isolated from Cerebrospinal fluid, a case of acute meningitis

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Abstract
Kocuria species is emerging opportunistic pathogens mostly seen in immunocompramised patients and severe underlying disease. Nowadays the incidence of different types of Kocuria infections have been reported even though sometimes misidentified as CONS. To confirm them as pathogens by using newer methods like Vitek 2, MALDI-TOF Spectrometry, 16S RNA and repeated specimens have been used. Here, we report a case of acute bacterial meningitis caused by K. kristniae.
Keywords: *Acute bacterial meningitis, Kocuria kristinae.*

Introduction

Kocuria spp are gram positive cocci in tetrads, belonging to the phylum Actinobacteria and family Micrococcaceae[1.] It is widely distributed in environment and generally nonpathogenic; mostly colonizes the skin, Mucous membrane and oral cavity as a commensal[2]. *K. kristniae* is a catalase positive, coagulase negative, non-motile and facultative anaerobic cocci[3]. It is an opportunistic pathogen and causes infection in immunocompramised, immunosuppressed and elderly individuals, as well as in severely debilitated incessantly sick patients.[4,5,6] It is morphologically similar to Gram positive cocci in clusters, sometimes misidentified as coagulase negative staphylococci in many laboratories. There are no specific clinical guidelines and only limited tests are available.[7, 8] This is a first case of acute bacterial meningitis due to *Kocuria kristinae* isolated from CSF with a fatal outcome according to our knowledge and literature search.

Case Report

A 35 years old male patient residing at Salvan, Kolhapur, Maharashtra, India was admitted to government hospital for head injury. He had suffered from seven episodes of convulsions. CT scan showed epidural hematoma and he underwent left temporoparietal craniotomy and evacuation of epidural hematoma and augmentation of duroplasty with pericranial grafting. He was started on treatment for the same.

Eight days back he had Dengue IgM positive and was started on treatment for dengue infection also and he was discharged from the hospital.

He again went to hospital with complaints of fever of acute onset. The fever was continuous, high grade, associated with chills with no diurnal variation and was not associated with any other relevant factors. He had no history of vomiting, loose bowels, no burning micturition, no abdominal pain but he had altered sensorium. Patient was transferred to our hospital (Padamashree DY Patil Hospital and Research Institute) for further treatment.

On General examination, the patient was afebrile, Pulse rate 96/minutes, BP 130/80 mm of Hg; no pallor, clubbing, icterus, oedma, lymadenopathy, cyanosis etc. On Systemic examination he had signs of meningeal irritation. There was no other significant relevant finding. Patient was chronic alcoholic for 12 years, but he had stopped taking alcohol after treatment. On general examination patient was conscious, well-nourished and well-built. Patient's family history was not contributory. He was admitted to MICU, temperature chart was maintained. CSF and Blood samples were collected and sent to respective laboratories. Then he was started on empirical antibiotic treatment with Inj. Vancomycin 500mg b d.

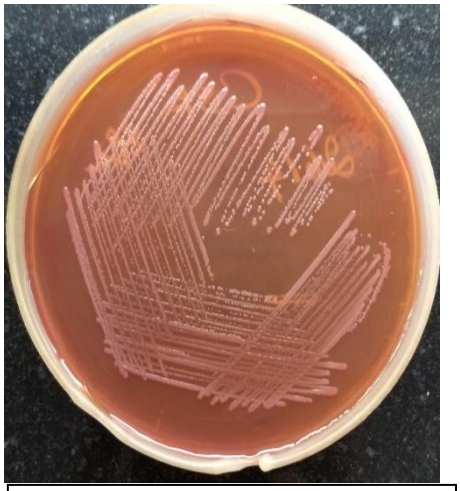
On examination, the cerebrospinal fluid (CSF) was turbid with 98% polymorphs and 2 % lymphocytes. The CSF sugar was low (14 mg/dl) with raised proteins (339.9mg/dl). Hemoglobin was 9.0g/dl. Peripheral blood smear shows microcytic, hypochromic anemia and anisocytosis. Serum electrolytes and liver function tests were within normal ranges.

Gram stain of CSF showed Gram-positive non-capsulated cocci, predominantly in clusters with numerous polymorphs. Tests for HIV, HBV and HCV antibodies were negative.

Culture of CSF on Blood agar and Chocolate agar showed non-haemolytic colonies, 0.5-1mm in diameter, creamy-white, opaque, round to convex with well-defined edges and matted texture. Growth on Mac-Conkey agar showed light pink, opaque, round colonies measuring 0.25to0.5-mm diameter with well-defined edges after 24 hours of aerobic incubation. Gram staining of smears from colonies revealed Gram positive cocci arranged in clusters. They were catalase positive, coagulase negative. The isolated colonies were immediately loaded to Vitek 2 (bio Mérieux Vitek 2, France) and AST was done manually by Kirby-Bauer disc diffusion method according to CLSI Guidelines 2018[9]for coagulase negative *Staphylocooci* panel. It was sensitive to Doxycycline, Chloramphenicol and Polymixin B and intermediately sensitive to Vancomycin, Tigecycline and Tobramycin There are no specific guidelines yet to perform Antibiotic Susceptibility testing for *Kocuria kristinae*. Vitek showed *Kocuria kristinae* after 6 hrs of incubation with 90% probability.

Blood culture was positive for growth after 3 days of incubation (Matrix labs Render BC 32). This was further confirmed by standard methods and Vitek also. On second day of hospitalization he had tachypnoea. Patient was kepton ventilator and started on inj. Doxycycline 100 mg t i d. We advised them to senda second CSF sample for confirmation.

The cerebrospinal fluid (CSF) was turbid with 85% polymorphs and15 % lymphocytes. The CSF sugar was slightly increased (18 mg/dl) with slightly decreased proteins (130/dl). Hemoglobin was 10.0g/dl. Serum electrolytes and liver function tests were within normal ranges. *Kocuria kristinae* was isolated again in gram staining and culture. Blood culture bottle also showed growth after 2 days of incubation and this was further confirmed by Vitek 2.



Growth on Mac-Conkey agar

Growth on Blood agar

Growth on Chocolate agar

Discussion

Kocuria kristinae is a commensal and an opportunistic pathogen mostly seen in immunocompramised and immunosuppressed patients such as cancer[10,11], renal failure in dialysis patients[12,13] diabetes[14] and infants. It has low virulence and is aless harmful bacteria. Sometimes it is considered as a contaminant. Only few studies have reported *Kocuria spp* infections. There is no literature for *Kocuria kristinae* meningitis to our knowledge, but other species such as *Kocuria rosea* have been shown to cause meningitis[15]and *Kocuria varians* is associated with brain abcess[16]. Based on patient's clinical manifestations and repeated laboratory investigations we confirmed that this is a case of Meningitis caused by *Kocuria kristinae.*

In this case, the patient had undergone craniotomy. Hence, there is a chance that the cocci may have directly entered during head injury; and could have established the opportunistic infection. Nowadays *Kocuria spp* is an emerging pathogen. Physicians and Microbiologist should be alert and be able to identify the bacteria and it's possible source to avoid the misidentification of this bacteria.

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References

1. E. Stackebrandt, C. Koch, O. Gvozdiak, and P. Schumann "Taxonomic dissection of the genus Micrococcus: Kocuria gen. nov., Nesterenkonia gen. nov., Kytococcusgen. nov., Dermacoccus gen. nov., and Micrococcus cohn 1872 gen. emend," *International Journal of Systematic Bacteriology*1995; vol. 45: pp. 682–692.
2. Szczerba I. Occurrence and number of bacteria from theMicrococcus, Kocuria, Nesterenkonia, Kytococcus and Dermacoccus genera on skin and mucous membranes in humans [Article in Polish]. Med DoswMikrobiol 2003; Vol55: pp67-74.
3. Mapary Lakshmikantha, Verma Dev ki* and Chander Yogesh "Is *Kocuria kristinae* an upcoming pathogen?" *Int.J. Curr. Microbiol.App.Sci*2015: Vol 4 pp 885-889
4. Martinaud C, Gaillard T, Brisou P, Gisserot O, de Jaureguiberry JP. Bacteremia caused by *Kocuria kristinae* in a patient with acute leukaemia [Article in French]. Med Mal Infect 2008; Vol38: pp165-6.
5. Basaglia G, Carretto E, Barbarini D, et al. Catheter-related bacteremia due to

Kocuria kristinae in a patient with ovarian cancer. J ClinMicrobiol 2002; Vol40: pp311-3.

6. Ma ES, Wong CL, Lai KT, Chan EC, Yam WC, Chan AC. *Kocuria kristinae* infection associated with acute cholecystitis. BMC Infect Dis 2005; vol5: pp60.
7. Mekuzas, and Y. Carmeli, "Erroneous reporting of coagulase negative staphylo-cocci as *Kocuria*spp. By the Vitek 2 system," *Journal of Clinical Microbiology* 2005; vol43, no.3, pp. 1448–1450,
8. W. E. Kloos, T. G. Tornabene, and K. H. Schleifer, "Isolation and characterization of micrococci fromhuman skin, including two new species: Micrococcuslylae and Micrococcus kristinae," *International Journal of Systematic Bacteriology*1974; vol. 24,no. 1, pp.79–101,
9. https://clsi.org/education/2018-ast-packages/
10. Basaglia G, Carretto E, Barbarini D, Moras L, Scalone S, Marone P, et al. Catheter related bacteremia due to *Kocuria kristinae* in a patient with ovarian cancer. J Clin Microbiol. 2002;Vol40: pp311-313.
11. Martinaud C, Gisserot O, Gaillard T, Brisou P. Bateremia caused by *Kocuria kristinae* in a patient with acute leukaemia. Med Mal Infect. 2008;vol38: pp334-335
12. Carlini A, Mattei R, Lucarotti I, Bartelloni A, Rosati A. *Kocuria kristinae*: An unusual cause of acute peritoneal dialysis-related infection. Perit Dial Int. 2011;Vol31: pp105-107.
13. Cheung CY, Cheng NH, Chau KF, Li CS. An unusual organism for CAPD-related peritonitis: *Kocuria kristinae*. Perit Dial Int. 2011;vol31: pp107-108
14. Citro R, Prota C, Greco L, Mirra M, Masullo A, Silverio A, Bossone E, Piscione F. *Kocuria kristinae* endocarditis related to *Su et al.; IJMPCR,* diabetic foot infection. J Med Microbiol. 2013;vol 6, no 62: pp932-934.
15. Mousumipaul, Renugupta, Sumankhush-waha, Rajeev Thakur "*Kocuria rosea*: An emerging pathogen in acute bacterial meningitis"Journal of microbiology and antimicrobial agents. 2015; vol1(1): pp4-7
16. Cheng-Yu Tsai, Shou-hsinSu, Yu-Hsin Cheng, Yu-lin Chou, Tai-Hsin Tsai, and Ann-Shung Lieu" K*ocuria varians* infection associated with brain abscess: A case report" BMC Infect Dis. 2010; vol10: pp102.