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Kocuria varians meningitis in a child with chronic granulomatous disease

Alina Grama[1], Claudia Sîrbe[1], Otilia Fufezan[2], Tudor Lucian Pop[1]

[1]2nd Pediatric Clinic, Department of Mother and Child, University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca, Romania; Emergency Clinical Hospital for Children, Cluj-Napoca, Romania

[2]Department of Radiology, Emergency Clinical Hospital for Children, Cluj-Napoca, Romania

Bacteriae of the *Kocuria* genus are microorganisms that belong to *Actinobacteria* class, *Actinomycetes* order, *Micrococcaceae* family. *Kocuria* was described for the first time in 1974 by the Slovak microbiologist Miroslav Kocur as gram-positive aerobic and facultatively anaerobic cocci, which grow on sheep blood agar cultures. There are 18 species of *Kocuria*, most of them considered commensal bacteria, and only some are potential pathogens *(K. kristinae, K. varians, K. rhizophila, K. rosea,* and *K. marina)*. In humans, *Kocuria* can be found on the skin and oral cavity and is usually nonpathogenic. In immunocompromised patients, it can become pathogenic, causing cholecystitis, peritonitis, catheter-associated bacteremia, dacryocystitis, endocarditis, or meningitis (1-3).

We present the case of an infant with a chronic granulomatous disease (CGD), diagnosed with meningitis with *K. varians* at the age of 11 months. He was the first child of the family, born vaginally at 39 weeks of gestation. The pregnancy had been periodically monitored in the local hospital, and there was no consanguinity in the parents. The patient's medical history is insignificant until the age of 5 months, when he was first hospitalized for severe acute bronchopneumonia with a papulosquamous, erythematous eruption in the scalp and aphthous stomatitis. Blood cultures were positive for *Staphylococcus hominis,* and he received treatment according to the antibiogram with oxacillin and ceftriaxone. Numerous hospitalizations for severe bacterial and fungal infections followed, requiring intravenous antibiotics and antifungal treatment.

Based on the history of severe infections, we raised the suspicion of immunodeficiency, and we confirmed the diagnosis of CGD by nitro blue tetrazolium test and Burst test.

At the age of 11 months, he was admitted again with the severe clinical picture of acute bronchopneumonia. Cultures from sputum and bronchial aspirate were positive for *Pseudomonas aeruginosa* and *Candida albicans*, requiring treatment with antibiotics and voriconazole. After 2 weeks, the child presented with alteration of neurological status and bulge of the fontanel owing to a central nervous system infection. Trans-fontanel ultrasound and cerebral magnetic resonance imaging confirmed the diagnosis of acute meningoencephalitis. Cerebrospinal fluid (CSF) was turbid with predominating polymorphs, with a high CSF protein level (5.2 g/dL) and decreased CSF glucose of 24 mg/dL. CSF culture and blood culture were positive for *K. varians*. The infant received intravenous vancomycin and meropenem for 21 days according to the antibiogram and recovered without any neurological sequelae.

So far, approximately 25 cases of *K. varians* infection have been described, most of them in immunosuppressed adults (diabetes, chronic kidney disease and peritoneal dialysis, patients with prosthetic valves), presenting with purulent conjunctivitis or brain abscesses, endocarditis, or peritonitis (4-8). In children, infections with *Kocuria* are extremely rare; only a few cases have been reported. One example is a catheter infection with *K. varians* in a 7-month-old infant after intestinal atresia surgery. Other species of *Kocuria (K. kristinae, K. rhizophila, K. marina*) were reported in severe infections in children with Hirschsprung disease, Wilms tumor, and pulmonary hypertension or after cardiac surgery (9-12). Because of the small

Corresponding Author:
Tudor Lucian Pop
✉tudor.pop@umfcluj.ro
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turkarchpediatr.org

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number of reported cases, there is no protocol for the management of *Kocuria* infection in children. In our case, the treatment was vancomycin and meropenem for 21 days according to the antibiogram. The outcome was favorable; the child recovered completely neurologically and he was discharged at home on day 54 with trimethoprim-sulfamethoxazole and itraconazole prophylaxis.

This case may add to the data already known in the literature on infections with species of *Kocuria* genus. As for *K. varians*, this is probably the first child reported with meningitis, an infection favored by the child's immune deficiency.

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