



Bacteriemia by *Kocuria rosea*: A Case Report

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Abstract

Kocuria rosea is a gram-positive coccus that belongs to the *Micrococcus* genus. Although it is found in the environment it can be found in the microbiota of the skin and oropharynx. Infections caused by *Kocuria* are rare. Nevertheless, some risk factors described in the literature include immunosuppression, non-transmissible chronic diseases, cancer, and organ transplant patients. Currently, there are 16 cases reported worldwide, none of which were made in Colombia. We report a case of a 25-year-old male patient with Marfan's Syndrome presenting to the emergency department after 5 days of a dry cough and non-dysenteric diarrhea. Laboratory findings were significant for coagulopathy. Finally, bacteremia by *Kocuria rosea* was established and treated successfully with ceftriaxone and vancomycin.

Keywords: *Kocuria rosea*; Bacteremia; Coagulopathy; Marfan's syndrome; Soft tissues infection.

INTRODUCTION

Stackebrandt, et al. [1] divided in 1955 *Micrococcus* genera into five subgenera including *Kocuria*, *Micrococcus*, *Nesterenkonia*, *Kytococcus*, *Dermacoccus*. *Kocuria* belongs to the Micrococcaceae family which is distinguished as a gram-positive non-capsulated aerobes and non-endospores forming coccus [2,3]. Occasionally the gram-positive pair clustering pattern has been confused with coagulase-negative *Staphylococcus* cultures. The differences rely on reported susceptibility to bacitracin, lysozyme, and resistance to Nitrofurantoin/Furazolidone [1]. Some authors point properties such as negative nitrate reduction and positive esculin hydrolysis [4]. Therefore, 16SrRNA gene sequencing is suggested for its discernment [5].

Other authors like Ananieva MM, et al. [6] have reported *Kocuria rosea* inhabiting the oropharynx's microbiota. Likewise, it has been found on skin, mucosal membranes [7], soil [8], and some medical supplies such as catheters [9-12]. It rarely causes severe diseases, nonetheless, there is an increasing number of recent infection cases. It is important to notice that its low number of cases might be explained by false-positives results with coagulase-negative *Staphylococcus* [1].

CASE PRESENTATION

A 25 years old man with Marfan's Syndrome presented to the emergency department with a 5-day history of abdominal pain, fever, joint and muscular pain, headache, and nose bleeding. Later on, he presented vomit and melanic stool. He was admitted with a heart rate of 81 beats per minute, a respiratory rate of 16 breathings per minute, oxygen saturation of 92% with a 21% FiO₂, a temperature of 101,84°F, and a blood pressure of 112/72 mmHg. Initially, he was diagnosed with upper gastrointestinal bleeding and was treated with intravenous crystalloids. In addition, blood

tests were performed showing compatible findings with coagulopathy (Table 1).

Although the patient was a candidate for upper gastrointestinal endoscopy, it was avoided because of the coagulopathic findings. According to Marfan's syndrome history and fever, an echocardiography was performed and revealed an aortic root dilatation at Valsalva's sinuses level with mild aortic insufficiency. No vegetations or other anomalies were found. A transabdominal ultrasound revealed splenomegaly. HIV and dengue serology results were negative. As the patient persisted with headache, joint pain, muscle pain, and objective fever, a lumbar puncture was performed after correction of coagulopathy. Cerebrum spinal fluid (CSF) showed 89 x mm³ WBC, 10% neutrophils, 90% lymphocytes, a glucose of 44 mg/dl, proteins of 30 mg/dl. Neuro-infection diagnosis was established, blood samples were obtained for culture and *Kocuria rosae* was isolated.

Looking for the infection source, the patient was re-interrogated. He reported a one-year history of paronychia in his left first toe's phalanx. He also mentioned paronychia worsening few days before his clinical manifestations.

A dose of 2 grams of IV ceftriaxone and 1 gram of Vancomycin, both twice a day were started. After 48 hours of antibiotics, the patient presented substantial clinical improvement. Fever decreased and following blood samples cultures were negative.

DISCUSSION

Kocuria genus includes 19 species which at the present only 3 have been considered pathogenic to the human race (*K. rosea*, *K. varians*, *K. kistinae*). This genus was named after Slovenian microbiologist Miroslav Kocur. It is a gram-positive coccus that belongs to the Micrococcaceae family, Actinomycetales order, and Actinobacteria class [13,14]. Includes some species such as: *Kocuria assamensis*, *Kocuria aegyptia*, *Kocuria gwangalliensis*, *Kocuria atrinae*, *Kocuria carniphila*, *Kocuria flava*, *Kocuria palustris*, *Kocuria halotolerans*, *Kocuria himachalensis*, *Kocuria koreensis*, *Kocuria kristinae*, *Kocuria marina*, *Kocuria polaris*, *Kocuria rhizophila*, *Kocuria rosea*, *Kocuria salsicia*, *Kocuria sediminis*, *Kocuria turfaniensis*, and *Kocuria varians* [1-6].

Kocuria spp. Infection's cases have been reported in immunosuppressed patients, such as transplant recipients, patients with neoplasms, AIDS, and other chronic diseases [14-18]. *Kocuria rosea* has been isolated in cases of native-valves infectious endocarditis, catheter-associated infections, keratitis, meningitis, urinary tract infections, cholecystitis, dacryocystitis, dental cavities, Spontaneous Bacterial Peritonitis (SBP), necrotizing mediastinitis, and cerebral abscesses [19-

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Table 1: Laboratory data.

Day 1	Day 2	Day 3
Hemoglobine 14.7 gr/dL. Platelet count 123.000/mm ³ . Prothrombin Time (PT) 32.1 seconds. Partial Thromboplastin Time (PTT) 48.8 seconds. INR 2.51. White Blood Cell 8800/mm ³ . Neutrophiles 87% Lymphocytes 9.5%. HIV: Negative	Hemoglobine 13.1 gr/dL. Platelet count 171.000/mm ³ . Prothrombin Time (PT) 15.2 seconds. Thromboplastin Time (PTT) 27.5 seconds. INR 1.09. CPK Total: 75 U/mL. Alkaline Phosphatase (AP) 114 UI/L. Aspartate aminotransferase (AST) 203 UI/L. Alanine aminotransferase (ALT) 176 UI/L. Gamma-glutaryl-transferase (GGT) 131 UI/L. Amylase 29 U/L. Total Bilirubin 1.86 mg/dL.	Lumbar puncture (described below) Hepatic workout: negative Syphilis serology: negative Hemoculture: positive for <i>Kocuria rosea</i> .

27].

In this case, reported bacteremia initiates as a soft tissue infection. The latter is coincident with the reviewed literature. Nonetheless, simultaneous bacteremia, Disseminated Intravascular Coagulopathy (DIC), and meningeal compromise have not been reported in the past.

Due to the microorganism's capacity to form biofilms, it is important to perform an appropriate antimicrobial removal for the optimal management of catheter-associated infections [20].

In the portrayed patient, there is a Central Nervous System compromise (CNS). Thus, it is important to point that *Kocuria rosea* can cause neural infection by direct invasion of the CNS through nasopharynx and cribriform plate. Mostly, as a consequence of usual colonization of this anatomic area [25].

Regarding antimicrobial management, *Kocuria rosea* presents sensibility to doxycycline, ceftriaxone, cefuroxime, amikacin, and amoxicillin/clavulanic acid. Resistance to nitrofurantoin/furazolidone and macrolides has also been reported. Along with other gram-positive bacteria, *Kocuria rosea* is susceptible to penicillin, vancomycin, quinolones, and linezolid [26].

The limited number of published cases consider *Kocuria* spp. as an infrequent pathogen in immunocompromised patients and rarer in immunocompetent patients [8].

The prevalence of this atypical infection has not been formulated yet. The level and the quality of the evidence is low in the reviewed articles, predominately case reports [14-27].

There were found only two case series in Latin America (Chile [2] and

Costa Rica [14]). This article is the first case reported in Colombia.

The importance of the presented case series relies in the need to include this microorganism in the differential diagnosis of coagulase-negative *Staphylococcus* infections in patients with risk factors such as Marfan's Syndrome, soft tissue infections, catheters, immunosuppression, and others.

In our research, this is the first reported case of infection by *Kocuria rosea* associated with Marfan's syndrome.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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