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Kocuria kristinae Infection in Immunocompromised Patients

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ABSTRACT

Kocuria kristinae is non-pathogenic Gram-positive coccus and an emerging pathogen predominantly affecting immune-compromised induvial, frequently leading to severe infections. It is related with nosocomial infections and drug resistance. That comprises adults with bacteremia being most common clinical manifestation. Infections typically existing with nonspecific symptoms and complicating diagnosis. Most clinical forms comprise bloodstream infections, skin infections, and infections associated to medical devices. Effective management involves timely identification and suitable antibiotic therapy, as K. kristinae shows multidrug resistance.

The aim of the study is to focus on the bacteria K. kristinae, to draw attention to its danger in clinical settings.
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INTRODUCTION

Kocuria kristinae is a non-pathogenic Gram-positive coccus that put into a novel genus, genus Kocuria of family Micrococcaceae [1,2]. Genus Kocuria was reclassified from Micrococcus genus in 1999. Various studies have shown that Kocuria spp. are etiological agents of nosocomial infections in individuals with predisposing immunosuppression factors [3,4]. However, only a few studies have focused on outbreaks caused by Kocuria spp. and conducted molecular studies. Numerous case reports have demonstrated human infections from Kocuria species, mainly in immunocompromised patients [5]. This emerging pathogen has increased in great interest, as it is known for being related with its multiple drug resistance phenotypes. [2]

Numerous predisposing factors can increase risk of Kocuria spp. infections, predominantly hospital-acquired infections caused by contaminated medical devices and even healthcare workers. In developing countries, a absence of good hygiene practices can increase of risk of Kocuria contamination [6].

As a result, studies recognize that Kocuria infections are often associated with infections developed within the community. Likewise, a majority of the incidence of Kocuria spp. in clinical samples, such as cerebrospinal fluid, blood, sputum, and urine, was mostly seen in the older [7].

In light of this concerning aspect, an overview of Kocuria kristinae infections associated with conditions in the population is critically needed [8].

The aim of the study is to focus on the bacteria K. kristinae, to draw attention to its danger in clinical settings.

Epidemiology

K. kristinae is non-motile, non-spore-forming, and nonacid-fast cocci, which usually form clusters. Most strains ferment glucose or maltose. The incidence of Kocuria kristinae has increased in immunocompromised patients. [9, 10].

Most cases of Kocuria kristinae bacteremia have been reported in adults. Only a few cases have been reported in children. Clinical sepsis most commonly affected patients with predisposing conditions, for instance removal of central venous catheters and presence of underlying gastrointestinal diseases, advanced cancer, history of gastrointestinal and hepatobiliary surgery, and chemotherapy [11,12].

Recently, a few reports describe cases of Kocuria infections in immunocompromised patients, and a few other cases are cited. [13].

The majority of reported cases had bacteremia, requiring prolonged treatment with intravenous vancomycin. Primary infection in this context has ranged from diverse entities, comprising anemia, pneumonia, osteomyelitis, and infection of central venous catheters. [14, 15].

The incidence of Kocuria kristinae infection complicating terminal illness, for instance mechanical ventilation treatment in an intensive care setting, is becoming an increasingly established fact. The infection may occur in all ages, but majority of infected patients are adults. [3,9]. Iatrogenic factors for instance surgery and catheter placement have been implicated in some cases. The pathogens are extensively distributed, and cases of human infection have been reported universal, with predominance in areas with warm and humid climates. The recognition of Kocuria kristinae as a pathogen is a recent issue [9].

Only 28 cases of infection have been reported in last decade. Only 32 cases of Kocuria prosthetic joint infection have been reported. Clinical symptomatology associated to Kocuria kristinae is listed extensively. The worldwide distribution is revealed, and geographical circumstances were unknown for 25 of the reported cases. [2].

Outbreaks and clusters of Kocuria kristinae infections have been reported in hospitals. Bacteria can adapt to harsh hospital environments by forming biofilms over surgical instrument surfaces, causing serious postoperative infections. [10, 15].

It is also described in burn wounds, and such infections are to be considered very extremely in burn patients. However, the virulence potential of Kocuria bacteria is unknown. Since clinical interest in Kocuria spp. is evolving, it is necessary to know clinical aspects of infection due to Kocuria kristinae. [11]

There is a strong possibility that this infection may be transmitted in healthcare settings because the major predisposing factors include indwelling catheters, advanced malignancy, and chronic renal failure [16,17]

Therefore, it is necessary to investigate more about transmission and reservoir of this bacterium. In healthcare settings, Kocuria species can be transmitted to other hospitalized patients and healthcare workers through handshakes and poor hand-washing techniques [18].

Person-to-person transmission has been reported in a few cases. Studies have shown potential for spread within healthcare settings [4, 19].

Advances in molecular technology will permit better elucidation of morbidity and mortality due to this bacterium. It is very important to monitor the infection through data based on surveillance since infection is recognized across the globe. The growing recognition of the infection due to Kocuria species indicates a need for further investigation because the pathogen has been evolving rapidly [9].

Clinical Manifestations

Kocuria kristinae infection in normal hosts is rare. Among the documented cases, patients who have K. kristinae infections are immunocompromised with comorbid illness. They usually present with nonspecific and atypical clinical features for infection [19].

Patients who are infected with K. kristinae might have confounding symptoms due to respiratory and gastrointestinal problems, which might overlap with the infections caused by other microbes [20, 21].

There have been numerous clinical forms. The most common presentation was bloodstream infection, followed by skin and connective tissue infections, including cellulitis, sternal abscesses, peritoneal dialysis catheter infection, and surgical site infections. Some K. kristinae cases also presented with endocarditis, septic arthritis, or meningitis, surgical site infections, synovitis, conjunctivitis, and peritonitis. [6]

The clinical presentations of these cases range from mild symptoms to severe, life-threatening infections. Hence, the diagnosis of K. kristinae infection is difficult and could be delayed because K. kristinae infections usually have overlapping clinical manifestations with other organisms that cause infections [22].

It is important to recognize risk factors, co-infections or specific influences, history of infection, the relevant travel history, empirical antimicrobial therapy, and the radiologic and microbiological laboratory findings in order to identify K. kristinae infection and act promptly [23]

Diagnosis

The growth of microorganism in culture is a criterion for the diagnosis of infections caused by Kocuria spp. The culture method of choice is same as any conventional bacteriological method: culture media and standard conditions for bacterial isolation [6].

Particular kits can be used for molecular diagnostics that provide reliable diagnostic results in less processing time. Based on the described laboratory findings of patients with K. kristinae bacteremia and/or other invasive infections, they share some characteristics that can draw attention to the physician for an early diagnosis [25].

Most of patients are diagnosed in the ICU; some originated in cancer hospitals, some are elderly, and all of them have comorbidities comprising infections, heart disease, and hematological diseases. Timely and proactive interactions among clinicians, laboratory microbiologists, and infectious disease physicians are particularly important, especially in determining drug regimen in managing K. kristinae infection. [25]

It is important to perform good identification because some strains are not pathogenic, and this will prevent the misuse of antibiotics by patient and adverse effects. The result of antimicrobial susceptibility testing can guide the doctors to the proper antibiotics and dosage used for therapy [6].

Treatment

Numerous antibiotic resistance patterns are reported for Kocuria species due to general resemblance to commensal flora of the human body and due to indolent growth of hosts. However, antibiotics like vancomycin, third-generation cephalosporins, and quinolones are proven to be highly effective for use [3].

Between the cephalosporin, ceftriaxone is non-restricted for use due to its effectiveness against beta-lactamase, making it useful in this antibiotic-resistant isolate strain. [26].

Moreover these antibiotics, preferably antibiotics such as co-trimoxazole and linezolid, which have less reported resistance, are suggested to be chosen according to in vitro susceptibility [27].

The basis of selection of an antibiotic regimen is clinical severity, site of infection, ascertained in vitro susceptibility, and consideration of individual patient factors. In addition to antimicrobial therapy, appropriate and aggressive supportive care is also required [28]

Infection control practices are useful in preventing spread of human-origin pathogens in hospitalized settings. Monitoring and isolation of patients, use of personal protective equipment by hospital healthcare workers, and periodic cleaning and disinfection of inanimate objects, water, and floors are essential [29].

Infection control measures should be conducted under controlled and periodic observation by infection control board or committee of healthcare safety features. Infections of K. kristinae in immunocompromised patients are usually controlled by the appropriate use of antibiotics, and supportive interventions are undertaken to aid recovery from the clinical status. In the early phase of patient's enrollment, culture and sensitivity results obtained must be communicated to treating doctors that aids in the quick initiation of specific treatment [1].

Based on severity of the disease and immune status of the patient, management in terms of antibiotic therapy and supportive care is individualized. Re-evaluation of culture and susceptibility when advanced diagnostics are available is very important during the course of the disease. Research is required to understand role of combination of treatment modalities in management of K. kristinae in immunocompromised patients [30, 31]

CONCLUSION

Kocuria kristinae is an emerging pathogen that mainly affects immunocompromised induvial and leading to severe infections. Most clinical forms comprise bloodstream, skin infections and infections associated to medical devices.

Antibiotic resistance patterns are widespread in Kocuria species. Early diagnosis is critical for effective treatment. Infection control measures are essential in health care settings

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عدوى المكورات Kocuria kristinae في المرضى الذين يعانون من ضعف المناعة

الخلاصة

تعد المكورات البكتيرية Kocuria kristinae ذات الصبغة الإيجابية الگرام غير ممرضة، لكنها قد تكون ممرضة في الغالب في الافراد الذين يعانون من نقص المناعة، مما يؤدي في كثير من الأحيان إلى عدوى حادة، ويرتبط مع عدوى المستشفيات ومقاومة الأدوية.

ويعد المرضى البالغين المصابين ببكتريا الدم من أكثر المظاهر السريرية شيوعاً. وتوجد أحيانا حالات عدوى مصحوبة بأعراض غير محددة تؤدي إلى تعقيد التشخيص. وتشمل معظم الأشكال السريرية التهابات مجرى الدم، والتهابات الجلد، والالتهابات المرتبطة بالأجهزة الطبية. تتضمن الإدارة الفعالة التشخيص في الوقت المناسب والعلاج بالمضادات الحيوية المناسبة، حيث تظهر هذه المكورات K. kristinae مقاومة للعديد من الأدوية المستعملة.

تهدف هذه الدراسة الى التركيز على خطورة هذه الأنواع من البكتيريا للفت الانتباه إلى خطورتها في البيئة السريرية.