



A case report on *Kocuria kristinae* continuous ambulatory peritoneal dialysis peritonitis

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Abstract: *Kocuria kristinae* is a gram-positive cocci bacteria of the family *Micrococcaceae*. *Kocuria* species are bacteria commonly found in the environment and human skin flora. They are usually regarded as non-pathogenic bacteria, thus rarely associated with human infections. We report a case of *K. kristinae* related continuous ambulatory peritoneal dialysis (CAPD) peritonitis. The clinical presentation resembles that of usual CAPD peritonitis and diagnosis was made via routine laboratory and microbiological investigation. However, mortality occurred in our case due to severe sepsis with multi-organ failure.

Keywords: Continuous ambulatory peritoneal dialysis (CAPD); *Kocuria kristinae*; peritoneal dialysis; peritonitis

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Introduction

Peritonitis is a common complication of peritoneal dialysis and it is associated with significant morbidity and mortality. The most common symptoms of peritonitis are abdominal pain and cloudy peritoneal effluent. *Kocuria* species are bacteria commonly found in the environment and human skin. There are limited reported cases of *Kocuria* related human infection available in the literature. Here, we would like to report a case of *Kocuria kristinae* infection related with continuous ambulatory peritoneal dialysis (CAPD) peritonitis leading to catheter loss and death.

Case presentation

A 65-year-old man with end stage renal disease (ESRD) on peritoneal dialysis for five years presented with abdominal pain and cloudy peritoneal dialysate for four days. He was treated for CAPD peritonitis and started on empirical intraperitoneal (IP) antibiotics consisting of IP ceftazidime and IP cefazolin as per local nephrology protocol. Direct gram stain of his peritoneal fluid showed gram-positive cocci in clusters of tetrads which were catalase positive. The identification of organism was confirmed via VITEK 2

(bioMérieux) compact (GP card) with identity confidence level of 95% for *Kocuria kristinae*. Antimicrobial sensitivity testing was performed on the isolate using Epsilon test (E test). The minimum inhibition concentration (MIC) per Clinical and Laboratory Standards Institute (CLSI) criteria was $\geq 0.5 \mu\text{g mL}^{-1}$ for clindamycin, cotrimoxazole, erythromycin, fusidic acid, linezolid, oxacillin, penicillin, rifampicin and vancomycin. IP vancomycin was then started after the sensitivity results were known while IP cefazolin and ceftazidime were both stopped. His Tenckhoff catheter was removed as he developed refractory peritonitis. He was subsequently treated with intravenous (IV) vancomycin and piperacillin-tazobactam for 14 days, with therapeutic blood level of vancomycin. Unfortunately, his condition deteriorated and he passed away due to sepsis with multi-organ failure. Pure growth of *K. kristinae* was observed at his dialysate culture and his blood culture was sterile. The exact source of the *K. kristinae* could not be ascertained, yet it was possibly due to touch contamination of the catheter during peritoneal fluid exchange. A skin swab culture from his Tenckhoff catheter exit site was negative. This is an isolated case and the local infection control team did not identify any outbreak of similar organism during the same period of time.

Discussion

The genus *Kocuria* was named after Miroslav Kocur, a Slovakian microbiologist. This organism belongs to the family *Micrococcaceae*, suborder *Micrococcineae*, order *Actinomycetales*, class *Actinobacteria* (1). It includes Gram-positive, strictly aerobic, catalase positive, coagulase negative, non-hemolytic cocci. There are seventeen species of *Kocuria* species described so far. This organism frequently colonizes the skin, mucosa and oropharynx (1). To date, there have been limited reported cases of *Kocuria* infections in humans, and it is even rarer for *Kocuria* peritoneal dialysis peritonitis. To our knowledge, there have been two reported cases of *Kocuria kristinae* PD peritonitis in literature (1,2). The commonest *Kocuria* species causing PD peritonitis is *Kocuria varians* with 5 cases reported to date (3). There have been reports on erroneous identifications of coagulase negative *Staphylococci* as *Kocuria spp* by the VITEK 2 system due to its phenotypic variability. Due to lack of resources, we did not confirm the isolates via genotyping. We believe this modern VITEK 2 compact automated system is a reliable identification tool of *Kocuria kristinae* in our patient (3).

This organism is considered a harmless microorganism previously, but recently many reports associate this organism with severe infection. In the two reported cases of *K. kristinae* PD peritonitis, both patients were treated by antimicrobial therapy without removal of Tenckhoff catheter (1,2). Our patient however was not as fortunate. He received empirical antimicrobial therapy consisting of intra-peritoneal (IP) cefazolin and ceftazidime when PD peritonitis was first diagnosed while IP vancomycin was started when the culture and sensitivity results were known. Nevertheless, he developed refractory peritonitis and his Tenckhoff catheter was removed. Notably, a review revealed that 2 out of 12 episodes of *K. kristinae* PD peritonitis ended up with Tenckhoff catheter removal (3).

There is currently no guide on choices and duration of antimicrobial therapy for *K. kristinae* PD peritonitis. There have been cases treated for as short as 7 days and cases treated for 3 to 4 weeks (4-6), while our patient received 7 days of IP vancomycin followed by 14 days of IV vancomycin plus piperacillin-tazobactam.

Conclusions

At present, management of *K. kristinae* PD peritonitis largely depends on local nephrologists' opinion,

antimicrobial sensitivities, and limited case report experiences. There is no guideline to date that provides recommended treatment concerning this infection. We hope this case report on this rare condition could contribute to future larger review and recommendations.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/amj.2018.10.06>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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