

***Tsukamurella paurometabola* peritonitis in a patient on automated peritoneal dialysis**



Peritonitis por *Tsukamurella paurometabola* en un paciente en diálisis peritoneal automatizada

Dear Editor,

Tsukamurella spp. are gram-positive, mandatory aerobic, saprophyte bacteria found in water, soil, sludge, and it rarely causes infection in humans. Although the risk factors and the route of transmission are not certain, different clinical manifestations such as ocular and cutaneous infections, meningitis, tenosynovitis, prosthetic joint infections, respiratory tract infections, catheter-related bloodstream infections, and peritonitis are reported in the literature.¹

We present the case of a 67-year-old male patient with type 2 diabetes mellitus and chronic kidney disease admitted with complaints of abdominal pain and vomiting. The patient was on automated peritoneal dialysis for 8 years. There was not any redness, discharge, and tenderness around the peritoneal catheter insertion site. Laboratory investigation revealed white blood cell count of (WBC) $9.7 \times 10^3/\mu\text{L}$ ($4.3\text{--}10.3 \times 10^3/\mu\text{L}$), neutrophil count $8.53 \times 10^3/\mu\text{L}$ ($2.1\text{--}6.1 \times 10^3/\mu\text{L}$), erythrocyte sedimentation rate (ESR) 20 mm/h, C-reactive protein (CRP) 1.21 mg/dL (0–0.8 mg/dL), and procalcitonin 0.20 ng/mL (0–0.1 ng/mL). Abdominal computed tomography revealed diffuse contrast enhancement compatible with peritonitis. Thereafter, intravenous ampicillin/sulbactam (SAM), 1000/500 mg^{BID} was commenced empirically. Peritoneal fluid cell count was 4400/mm³ with 87.1% of neutrophils. The peripheral blood cultures signaled growth in aerobic bottles of the Bactec FX system (BD, USA) after 34 h of incubation. Gram staining from blood culture tubes showed straight, non-branching, Gram-positive rods. The specimens from the bottles were plated onto 5% sheep blood/eosin methylene blue agar (BD) and chocolate agar. On the other hand, peritoneal fluid culture taken from the peritoneal catheter was performed by inoculating sample into 5% sheep blood/eosin methylene blue agar (BD), chocolate agar, and fluid thioglycolate medium. The mediums were incubated at 35 °C in 5% CO₂. After 24 h, white, rough, dry, and non-hemolytic colonies were observed. Gram staining from peritoneal fluid culture showed non-branching, Gram-positive rods, too. The colonies were found to be catalase positive and oxidase negative. Matrix-assisted laser desorption ionization time of flight mass spectrometry (MALDI-TOF MS) system (Bruker, Germany) was used for identification (MBT 7854 MSP Library). The peritoneal fluid isolate identified as *Tsukamurella paurometabola* with a Bruker score of 2.1 by Bruker Biotyper indicated confident species level identification. The blood culture isolates identified as *Tsukamurella* spp. with a Bruker score of 1.9 by Bruker Biotyper indicated confident genus level identification. Gentamicin 0.6 mg/kg intravenously was added on treatment day 3. Peritoneal fluid pleocytosis decreased to 100/mm³ (22% neutrophil) on treatment day 6. Follow-up peritoneal fluid and blood cultures remained sterile. Gentamicin was discontinued on day 21. As patients' complaints did not improve, peritoneal dialysis catheter was removed surgically and the patient was put-on routine hemodialysis program on day 35. Peritoneal biopsy sample collected during catheter removal showed fibrotic changes and no sign of any other infection. Intravenous SAM switched to oral amoxicillin/clavulanate on the 37th day of treatment and continued for an additional 14 days. Complaints of patients improved totally after catheter removal.

Tsukamurella spp. have many common features with *Rhodococcus*, *Corynebacterium*, *Nocardia*, and *Mycobacterium*, which may lead to misidentification. In addition to this, the differentiation of *Tsukamurella* bacteria at the species level is quite complicated

and difficult by conventional methods. At present, the identification of bacteria up to the genus level can be accomplished with 16S rRNA sequencing, but PCR sequencing is still expensive and time-consuming. In contrast, MALDI-TOF MS is a rapid and cost-effective method. This method allows adding MSPs of bacterial species not included in the database to improve its performance. In a study using an expanded database, 98.3% of *Tsukamurella* isolates were correctly identified at the species level with a score of ≥ 2.0 .² Currently, the genus is composed of 17 validly identified species.³ MALDI-TOF MS can be used for routine species identification of *Tsukamurella* in clinical microbiology laboratories after optimization of the database by adding reference MSPs of all known *Tsukamurella* species.

Tsukamurella spp. are opportunistic pathogens and often cause catheter-induced infections. Previously, cases of peritonitis have been reported in patients receiving continuous ambulatory peritoneal dialysis.^{4,5} However, there is insufficient information about the clinical course and treatment duration. To our knowledge, the case we presented is the first case of *Tsukamurella* peritonitis that received automated peritoneal dialysis.

Consequently, *Tsukamurella* species are very rare in humans, as well as the presence of catheters and poor hygiene may pose a risk.

Funding

This research did not receive any specific grant from any funding agency in the public, commercial, or not-for-profit sector.

Conflict of interest

None.

Bibliografía

1. Safaei S, Fatahi-Bafghi M, Pouresmaei O. Role of *Tsukamurella* species in human infections: first literature review. *New Microbes New Infect.* 2018;22:6–12.
2. Teng JLL, Tang Y, Wong SSY, Fong JYH, Zhao Z, Wong CP, et al. MALDI-TOF MS for identification of *Tsukamurella* species: *Tsukamurella tyrosinosolvens* as the predominant species associated with ocular infections article. *Emerg Microbes Infect.* 2018;7.
3. Parte AC, Sardà Carbasse J, Meier-Kolthoff JP, Reimer LC, Göker M. List of Prokaryotic names with Standing in Nomenclature (LPSN) moves to the DSMZ. *Int J Syst Evol Microbiol.* 2020;0–5.
4. Shaer AJ, Gadegbeku CA. *Tsukamurella* peritonitis associated with continuous ambulatory peritoneal dialysis. *Clin Nephrol.* 2001.
5. Park J-C, Hong J-S, Seo J-G, Chung W-K, Seo Y-H, Lee H-H. A case of *Tsukamurella tyrosinosolvens* peritonitis associated with continuous ambulatory peritoneal dialysis. *Korean J Med.* 2009;76:225–8.

Rashad Ismayilov^{a,*}, Zeynep Cansu Duran^b, Gulsen Hazirolan^c, Ahmet Çagkan Inkaya^b

^a Hacettepe University Faculty of Medicine, Department of Internal Medicine, Ankara, Turkey

^b Hacettepe University Faculty of Medicine, Department of Infectious Diseases and Clinical Microbiology, Ankara, Turkey

^c Hacettepe University Faculty of Medicine, Department of Medical Microbiology, Ankara, Turkey

* Corresponding author.

E-mail address: ismayilov_r@hotmail.com (R. Ismayilov).

<https://doi.org/10.1016/j.eimc.2020.10.010>

0213-005X/ © 2020 Sociedad Española de Enfermedades Infecciosas y Microbiología Clínica. Published by Elsevier España, S.L.U. All rights reserved.