Enferm Infecc Microbiol Clin. 2020;38(2):88–93

Enfermedades Infecciosas y Microbiología Clínica

www.elsevier.es/eimc

Scientific letter

Arthrobacter creatinolyticus: An emerging human pathogen causing urinary tract infection

Arthrobacter creatinolyticus*: un patógeno emergente en el ser humano causante de infecciones del tracto urinario*

Arthrobacter creatinolyticus is a Gram-positive aerobic coccobacillus, catalase-positive, belonging to the family *Micrococcaceae*, order Actinomycetales, usually found in soil and in the environment. This organism produces urease, an extracellular enzyme with many industrial applications and a potential use in anti-cancer therapy due to its cytotoxic effect.[1]

We have only found in the literature one case of bacteremia due to this microorganism, and none confirmed as a cause of urinary tract infection. We present a case of urinary tract infection due to *A. creatinolyticus.*

A woman, in her ninety, came to the primary care with signs of agitation. The patient presented several pathologies as hypertension, diabetes, Parkinson's disease and vascular dementia. She was aggressive at the time of consultation and the exploration was complicated as well as the anamnesis that was unable to stablish the presence of urethral syndrome. In addition no urine test strip or sediment analysis was done. The caregiver confirmed that the patient did not had fever but she had been agitated for the past four days. On the suspicion of urinary infection, the doctor ordered a urine culture and prescribed fosfomycin empirically. After 24 h of incubation in the chromogenic medium UTI^{R} (Oxoid LTD, UK), >100,000 CFU/mL of *A. creatinolyticus* were isolated (Fig. 1).

The identification of the microorganism was performed by mass spectrometry using the MALDI-TOF Biotyper 3.1 (Bruker Daltonic GmbH, Bremen, Germany), resulting in *A. creatinolyticus* with a score of 2.3. This identification was confirmed by sequencing the 16 rRNA gene. To our surprise, the result was different: *Glutamicibacter creatinolyticus*. In fact, this is the same microorganism, being *A. creatinolyticus* its basonym (Hou et al., 1998),[2] which has recently been reclassified into a new genus. The sequence was 99% indentical to *G. creatinolyticus* type strain KY814694.1 using the NCBI 16S rRNA gene database.

The susceptibility to antimicrobials was performed by disc diffusion test and also by broth microdilution method using the automated system MicroScan Walkaway (Beckman Coulter, USA) using the Pos MIC Panel Type 33. The interpretation of the minimum inhibitory concentrations (MICs) was performed according to the breakpoints for *Corynebacterium* spp. and related groups established by the Clinical and Laboratory Standards Institute (CLSI) (Table 1).

After knowing the pattern of antimicrobial susceptibility, the treatment was changed to oral levofloxacin 250 mg daily for five days. One week after the end of treatment and due to the persistence of the agitation, the doctor ordered a new urine culture. Again, the same microorganism was isolated (>100,000 CFU/mL), and a new treatment was prescribed, with ciprofloxacin 250 mg bid for two weeks.

In a third urine culture taken 3 weeks later, *A. creatinolyticus* was isolated once again in a lower count (less than 10,000 CFU/mL) and the antimicrobial susceptibility profile remained unchanged. At this point, the clinical status of the patient had improved but she had developed a cystocele, and we considered that the organism was colonizing the urinary tract.

As we have previously mentioned, there is only one reported case of bacteremia due to this microorganism in an elderly person with diabetes and acute cholangitis.[3] On the other hand, another case reported describes the isolation of *A. creatinolyticus* strains found in the urine of patients with neuroblastoma[4] and low levels of creatinine in serum and urine. The authors emphasized that this bacterium possesses creatinase, an enzyme able to hydrolyze creatinine, but they did not find any clinical evidence of urinary infection caused by this organism.

In our patient, the existence of urinary tract infection based on the recent change on her clinical or functional status (acute confusional disorder, discomfort or agitation)[5] was confirmed twice by the presence of significant bacteriuria due to *A. creatinolyticus*. The patient clinical status improved but finally developed a cystocele due to the weakening of the pelvic muscles indicating that the organism was colonizing the bladder of the patient.

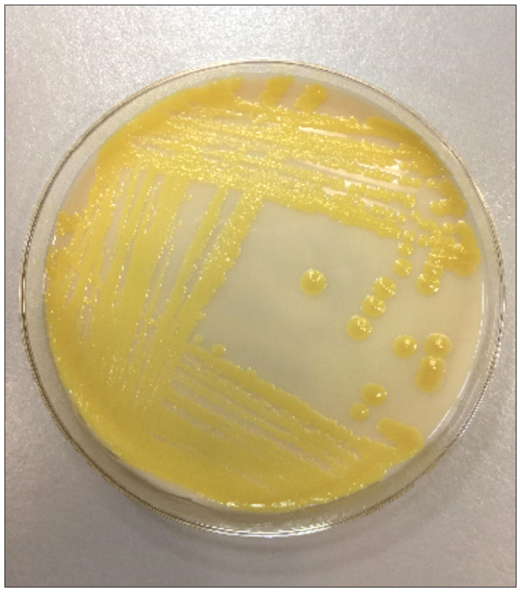

Fig. 1. Colonies of *Arthrobacter creatinolyticus* grown in UTI® chromogenic agar.

Table 1
Antimicrobial susceptibility profile of *Arthrobacter creatinolyticus*.

Antibimicrobials	Disc diffusion Inhibition zone (mm)	MIC (μg/mL)	Clinical category
Penicillin	30	<=0.12	S
Ampicillin–Amoxicillin	30	<=0.25	S
Amoxicillin/clavulanate	36	<=4/2	S
Vancomycin	24	<=0.25	S
Teicoplanin	26	<=1	S
Gentamicin	24	<=1	S
Linezolid	38	<=1	S
Ciprofloxacin	25	<=1	S
Levofloxacin	26	<=1	S
Nitrofurantoin	8	64	R
Fosfomycin	20	>64	R
Trimethoprim–Sulfametoxazole	46	<=2/38	S

CLSI criteria: S, susceptible; R, resistant.

Another species of this bacterium have also been described[6,7] as the etiologic agents of urinary tract infection (*A. albus*, *A. aurescens*, *A. cumminsii*, *A. protophormiae)*, and according to our case, we must include *G. creatinolyticus* (bfn. *Arthrobacter*) as an emerging pathogen causing urinary infection in the elderly.

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https://doi.org/10.1016/j.eimc.2019.02.003

Osteomielitis de la base del cráneo secundaria a otitis externa maligna por *Candida albicans:* papel del tratamiento con equinocandina asociado a desbridamiento quirúrgico

Candida albicans *skull base osteomyelitis due to malignant otitis externa: the role of echinocandin therapy associated with surgical debridement*

La otitis externa maligna (OEM), también denominada externa necrotizante, es una entidad poco habitual en nuestro medio, con una incidencia recientemente estimada en 1,30 casos anuales por millón de habitantes[1]. Afecta generalmente a pacientes de edad avanzada con diabetes mellitus (DM) mal controlada o inmunosupresión[1]. Tras originarse en el epitelio escamoso del conducto auditivo externo (CAE), la OEM puede invadir por contigüidad las estructuras óseas adyacentes y dar lugar a una osteomielitis de la base del cráneo de evolución potencialmente mortal. Si bien más del 90% de los episodios están causados por *Pseudomonas aeruginosa*, la OEM por *Aspergillus* spp. está bien descrita en pacientes con infección por el virus de la inmunodeficiencia humana (VIH) o neutropenia, siendo más raras otras etiologías fúngicas[2-4]. Presentamos a continuación un caso de OEM por *Candida albicans* complicada con una osteomielitis de la base del cráneo en un paciente sin patologías predisponentes y discutimos el papel de las equinocandinas en el tratamiento de este escenario poco habitual.

Se trata de un paciente de 63 años, natural de Ecuador y residente en nuestro país desde hacía más de 20 años, entre cuyos antecedentes personales figuraba la presencia de HTA, dislipidemia, hipotiroidismo subclínico y gota. Su tratamiento habitual comprendía bisoprolol, simvastatina y ácido acetilsalicílico. La sintomatología se había iniciado al menos 2 meses antes de la consulta inicial y consistía en otalgia, hipoacusia y otorrea por el oído derecho (OD). La otoscopia mostró en ese momento un CAE de paredes edematosas y eritematosas con tímpano íntegro. Tras realizar un ciclo de tratamiento tópico con dexametasona y gentamicina, una nueva otoscopia reveló una laceración del suelo del CAE que dejaba expuesto tejido óseo, con reacción inflamatoria y abundante otorrea. El paciente refería empeoramiento progresivo de la otalgia y del dolor preauricular a pesar del tratamiento analgésico. Una vez establecido el diagnóstico clínico de OEM se inició tratamiento con ciprofloxacino oral y tópico y se solicitó una tomografía computarizada (TC) de oídos y mastoides. Dicha exploración puso de manifiesto la existencia de áreas de rarefacción osteolítica que afectaban a las paredes del CAE derecho, con secuestros óseos y pequeñas burbujas de gas, hallazgos compatibles en su conjunto con una osteomielitis de la base del cráneo