Klebsiella pneumoniae ESBL forming spheroplasts in the fresh and unstained urine sediment

Klebsiella pneumoniae ESBL formando esferoplastos em sedimento urinário a fresco sem coloração

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Abstract

A 60 year-old man was submitted to kidney transplantation in 2013 due to chronic renal insufficiency caused by hypertension. He had recurrent episodes of urinary tract infection and came to the hospital due to a 4 day-long fever, abdominal pain, burning urination and nausea. Routine urinalysis revealed a picture of infection (> 50 leucocytes/high power field associated to massive bacteriuria). The urine sediment revealed elongated like elements with an enlarged part in the middle of the structure body.

Keywords: bacteriuria; infection; klebsiella pneumoniae; kidney transplantation; laboratory test; nephrology; transplantation; urinary tract infections.

Resumo

Um homem de 60 anos de idade foi submetido a transplante renal em 2013 devido à insuficiência renal crônica causada por hipertensão. Ele teve episódios recorrentes de infecção do trato urinário e veio para o hospital devido a 4 dias de febre, dor abdominal, ardência para urinar e náusea. Análise do sedimento urinário revelou um quadro de infecção (> 50 leucócitos/campo de grande aumento associado à bacteriúria maciça). O sedimento urinário revelou elementos alongados com um alargamento na parte central do corpo da estrutura.

Palavras-chave: bacteriúria; infecção; infecções urinárias; klebsiella pneumoniae; nefrologia; transplantation; testes laboratoriais; transplante de rim.

Sir,

A 60 year-old man was submitted to kidney transplantation in 2013 due to chronic renal insufficiency caused by hypertension. He had recurrent episodes of urinary tract infection and came to the hospital due to a 4 day-long fever, abdominal pain, burning urination and nausea. Routine urinalysis revealed a picture of infection (> 50 leucocytes/high power field associated to massive bacteriuria). The urine sediment revealed elongated like elements with an enlarged part in the middle of the structure body (Figure 1).

The Gram stain of the urine sediment showed that the structure acquired a Gram negative pattern. *Klebsiella pneumoniae*.

ESBL was identified as the unique germ in the urine culture sample in chromoagar plate (> 100.000 CFU/mL). The microorganism identification was confirmed by MALDI-TOFF (Log Score 2.426). The antibiogram test revealed sensibility to meropenem and antibiotic therapy (28 days) was started to acute pyelonephritis. The renal function was decreased and improved during the hospitalization period. Ultrasound and percutaneous anterograde pielography was performed due to the repetitive episodes of urinary tract infection without revealing evidence of stasis or stenosis from the kidney calix to the bladder. The patient was discharged in good general state oriented to maintain the medication in use and ambulatory care in the kidney transplantation unit.

The structures observed during routine urinalysis presented in Figure 1 were filamentous forms and spheroplasts that can be formed by Gram-negative bacteria when in presence of subinhibitory concentrations of β-lactam antibiotics.

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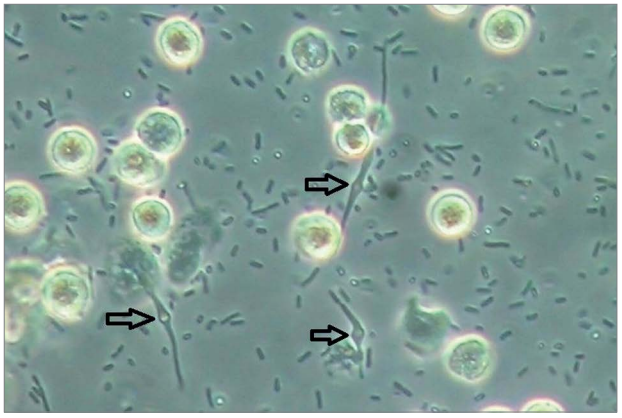
Figure1. Fresh and unstained urine sediment. Phase contrast microscopy. Original magnification 400x.



Clinicians and microbiologists should be aware about the morphological changes in Gram-negative organisms associated with subinhibitory concentrations of β-lactams.[1] The find is a clear clue to resistent forms of Gram-negative bacteria that can be easily identified during routine urinalysis, a surely neglected information on the usual urine sediment report.

Reference

1. Suwantarat N, Jacobs MR. Photo quiz: positive blood culture in a patient with sickle cell crisis. Answer: Klebsiella pneumoniae bacteremia showing filamentous forms and spheroplasts due to the presence of subinhibitory concentrations of beta-lactams. J Clin Microbiol 2013;51:2475, 2807.