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Abstract (poster session)

Clonal dissemination of Pseudomonas aeruginosa-producing extended spectrum ß-lactamase SHV-2a

K. Jeannot*, D. Fournier, E. Müller, P. Cholley, P. Plésiat (Besançon, FR)

Objective. Since its initial discovery in Klebsiella pneumoniae, the extended-spectrum ß-lactamase (ESBL) SHV-2a has successfully diffused among enterobacterial species. However, its occurrence in Pseudomonas aeruginosa has remained limited to sporadic strains. This study reports on the growing incidence of SHV-2a producing P. aeruginosa in French hospitals. Methods. Results From January to December 2011, the French National Reference Center for Antibiotic Resistance received and characterised 24 SHV-2a and one SHV-12 positive strains from 13 geographically distant hospitals. The strains were mainly isolated from urine, respiratory tract samples and blood. Production of an Ambler class A ESBL was suggested by a positive double-disk synergy test (DDST) between ceftazidime (CAZ) or cefepim (FEP) and amoxicillin/clavulanate (AMC). Drug susceptibility tests, PCR experiments and sequencing as well as genotyping by PFGE were performed according to standard procedures. Results. All the strains (serotype O:11) were resistant to penicillins (ticarcillin, MIC >256 mg/L; piperacillin 64 to 256) and FEP (16 to 128), with various degrees of resistance to CAZ (4 to 256). The insertion sequence IS26 was detected in all the strains upstream of the genes blaSHV-2a and blaSHV-12. The absence of detectable plasmids suggested that the genes were chromosomally located. The clonal relationship of the isolates but one was demonstrated by PFGE. A DDST was evaluated for the detection of SHV-2a. Interestingly, only 5 of the 25 SHV producing P. aeruginosa were positive when using CAZ and AMC discs. The detection was improved to 100% by using discs of FEP and AMC, and by supplementing the agar medium with 1,000 mg/L cloxacillin to inhibit cephalosporinase AmpC. Conclusion.This work indicates that one SHV-2 positive clone of P. aeruginosa disseminates in French hospitals. Because the resistance levels to CAZ may be low (8-16 mg/L) and the sensitivity of the DDST using CAZ is poor, some of the strains may be missed by clinical microbiologists. DDST with FEP and AMC on agar medium supplemented with cloxacillin should be applied on isolates resistant to ticarcillin showing a higher resistance to FEP than CAZ (> 2 fold).