

LETTER TO THE EDITOR

Effect of EDTA on the Susceptibility of *Pseudomonas aeruginosa* to Imipenem, Ceftazidime and Cefepime in Mueller-Hinton Agar

Nezahat AKPOLAT, Tuncer ÖZEKİNCİ, Gülseren AKTAR, Özge KARAŞAHİN, Adnan SUAY
Department of Microbiology, Faculty of Medicine, Dicle University, Diyarbakır - Turkey

Received: April 09, 2003

Imipenem is a highly potent carbapenem antibiotic active against a broad range of bacteria including *Pseudomonas aeruginosa* (1). A study by Yong and colleagues reported that ethylenediaminetetraacetic acid (EDTA) influenced the susceptibility of *P. aeruginosa* (2). The aim of this study was to determine whether imipenem and 2 cephalosporin (ceftazidime and cefepime) disks with and without EDTA influence the zone diameter of imipenem, ceftazidime and cefepime by the disk diffusion method.

Twenty-one *P. aeruginosa* isolates were studied. The control strain used throughout the study was *P. aeruginosa* ATCC 27853. All *P. aeruginosa* isolates were adjusted to the optical density of a 0.5 McFarland standard (10^8 cfu/ml) with sterile saline and then further diluted to achieve a final bacterial concentration of 10^7 cfu/ml. The antibiotic susceptibilities of *P. aeruginosa* isolates to imipenem (Oxoid, 10 µg), ceftazidime (Oxoid, 30 µg) and cefepime (Oxoid, 30 µg) with and without 150 µg of EDTA (EDTA was absorbed by the disks under sterile conditions) were determined by the disk diffusion method. EDTA solution (0.05 M) was prepared by dissolving 186.1 g of disodium EDTA. $2H_2O$ (Sigma, Product No: E 4884, Deisenhofen, Germany) in 1000 ml of distilled water and adjusting it to pH 8.0 by using NaOH. The mixture was sterilized by autoclaving on Mueller-Hinton agar (MHA, CM3378). The depth of MHA

was 0.4 mm. The procedure for the disk diffusion test was that recommended by the NCCLS (3).

The results of the susceptibility testing of 21 *P. aeruginosa* isolates to imipenem, ceftazidime and cefepime with and without EDTA are shown in the Table. Student's t test was used to evaluate the differences between the susceptibilities of clinical isolates of *P. aeruginosa* to imipenem, ceftazidime and cefepime with and without EDTA. $P < 0.05$ was considered significant.

This study showed that 3 disks with imipenem, ceftazidime and cefepime plus 150 µg of EDTA could increase the mean inhibition zone diameter for *P. aeruginosa*.

Table. Susceptibility of 21 *P. aeruginosa* isolates to imipenem, ceftazidime and cefepime with and without EDTA on MHA.

Antibiotic	Mean (SEM) zone diameter with	
	without EDTA	with EDTA
*Imipenem	22.4 (1.8)	24.5 (1.0)
**Ceftazidime	22.0 (1.6)	23.7 (1.8)
***Cefepime	22.6 (1.7)	25.7 (1.4)

* $P < 0.05$, ** $P < 0.05$, *** $P < 0.05$

References

1. Sanders CC, Sanders WE, Thomson KS, et al. Meropenem activity against resistant Gram-negative bacteria and interactions with β -lactamases. *J Antimicrob Chemother* 24 Suppl A: 187-196, 1989.
2. Yong D, Lee K, Yum JH, et al. Imipenem-EDTA disk method for differentiation of metallo- β lactamase producing clinical isolates of *Pseudomonas* spp. and *Acinetobacter* spp. *J Clin Microbiol* 40: 3798-3801, 2002.
3. National Committee for Clinical Laboratory Standards. Performance Standards for Antimicrobial Susceptibility Testing. Eleventh informational supplement. M100-S11, Wayne PA, NCCLS, 2001.