

Mecillinam resistance in Escherichia coli

Jenkins AJ¹ and Grude N²

1. Unilabs Telelab as, Skien, Norway.

2. Sykehus i Vestfold, Department of Microbiology, Tønsberg, Norway.

Introduction. Mecillinam is a β -lactam antibiotic used for treatment of urinary tract infections (UTI). We investigate the basis of resistance in clinical isolates that is not associated with resistance to other β -lactam antibiotics. *In vitro* resistance is caused by mutations in the *mre* gene cluster which is involved in the maintenance of cylindrical cell shape.

Materials and Methods. Eleven mecillinam resistant UTI isolates were investigated. Resistance to mecillinam and other antibiotics was investigated using disc-diffusion and Etest. The nitrocefin test for β -lactamase was applied. The cloverleaf test was used to test for mecillinam degradation. Resistance transfer was tested using cross-streak conjugation. Growth characteristics were noted and cell morphology was observed microscopically.

Results. MICs for mecillinam ranged from 32 to 256 mg/L. The isolates did not express β -lactamase, did not degrade mecillinam and did not transfer mecillinam resistance to sensitive isolates. Isolates were slow-growing and/or mucoid. Large-colony variants arose readily and these were sensitive to mecillinam. Preliminary results suggest that the cells are abnormally short. We are currently investigating the hypothesis that these isolates are *mre* mutants and will present the results of morphological studies and complementation tests using cloned *mre* genes.

Conclusions. Our results suggest that mecillinam resistance in clinical isolates of *E. coli* is caused by chromosomal gene mutations, possibly in the *mre* gene cluster. The authors thank Leo Pharma and NORM for financial support.