EV0439
ePoster Viewing
Resistance mechanisms

Mecillinam resistance in Enterobacteriaceae urinary tract isolates

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Background: Mecillinam (pro-drug pivmecillinam) is a beta-lactam antibiotic that has become an attractive oral option in the treatment of uncomplicated urinary tract infection (UTI). Resistance is believed to be secondary to mutations in gene targets involved in the elongation process. Recent studies show that mecillinam resistance is associated with highly diverse multi-resistance profiles and imposes a significant fitness cost to an organism suggesting a low propensity for clonal spread.

European surveillance data has indicated that mecillinam susceptibility of uropathogens is high at 95.9% .However increasing resistance rates have been observed in Sweden. UK specific resistance data remains largely unknown. A previous study in our institution revealed a 14% resistance rate in urinary tract isolates.

The objective of this study was to determine whether resistance to mecillinam was associated with beta-lactamase production in *Enterobacteriaceae* and if co-resistance towards other antibiotic classes was displayed.

Material/methods: All mecillinam resistant *Enterobacteriaceae* urinary tract isolates were analysed over a 10-month period (September 2014 to June 2015). Species identification and determination of mecillinam susceptibility was performed using VITEK 2. A sensitive result for mecillinam is a minimum inhibitory concentration (MIC) ≤ 8µg/ml and resistant MIC ≥ 32µg/ml. Phenotypic detection of beta-lactamase resistance was performed for each isolate as described by Schreckenberger *et al* . Co-resistance towards 6 other antibiotic classes commonly used in the treatment of UTI was analysed.

Results: A total of 144 isolates were analysed. Of the *Enterobacteriaceae* no beta-lactamase resistance was detected phenotypically in 60% (86/144) of isolates. Extended-spectrum beta-lactamase (ESBL) production was detected in 26% (37/144). AmpC beta-lactamase production was detected in 6% (9/144) and K1 beta-lactamase production was detected in 2% (3/144) . Both AmpC and ESBL production was detected in only 2% (3/144) . For 6 isolates, an inconclusive phenotype was detected that did not meet the interpretation criteria of Schreckenberger *et al.*

Interestingly 83% (120/144) of the isolates displayed resistance to >2 other classes of antibiotic, with 47% (67/144) displaying co-resistance to > 3 classes.

Conclusions: With the emergence of multidrug-resistant Gram-negative bacteria , mecillinam has shown a promising role for treatment of UTI. The Scottish Antimicrobial Prescribing Group advocates mecillinam as directed therapy for uncomplicated UTI and as an oral step-down for patients with Gram-negative septicaemia secondary to a urinary source.

Our study detected no associated phenotypic pattern of beta-lactamase resistance amongst mecillinam resistant isolates. However the number of isolates analysed was small and MIC values for mecillinam were not tested. Of interest however, the isolates displayed a high level of resistance to the other antibiotic classes.

We believe that further analysis is warranted to investigate the association with specific resistance lineages but also evaluation of clinical outcome of mecillinam therapy and continued surveillance for resistance is required.