Poster

# [P25-2] P25-2: Anti-infective drugs (2): Beta-lactams

Chair: Veronique Stove, Belgium

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## [P25-2-5] The SPIT study: correlation of saliva and plasma beta-lactam antibiotic concentrations in the intensive care unit

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### Background

Therapeutic drug monitoring (TDM) of bèta-lactam antibiotic can be used to optimize dosing in intensive care patients, as they might have a worse therapeutic outcome when exposed to inadequate antibiotic concentrations. The use of saliva in TDM has been studied for several drug classes, but not yet in detail for the beta-lactam antibiotics.

### Methods

Six paired saliva and plasma samples were obtained from three patients on meropenem, thirteen paired samples from six patients on piperacillin. Unbound and bound plasma antibiotic concentrations were measured after ultrafiltration at 37° Celsius. Antibiotic concentrations were determined using liquid chromatography–tandem mass spectrometry on a UPLC TQD (Waters, Milford, USA). The relationship between saliva and plasma concentrations was evaluated by studying the linear correlation and calculating and comparing the measured and theoretical saliva to plasma concentration ratios (S/P).

### Results

Pearson’s correlation coef cients for saliva versus unbound and total plasma meropenem concentrations showed a strong correlation (R = 0.8391 ($P<0.05$) and 0.8492 ($P<0.05$) respectively). For piperacillin, three outliers were removed. These samples were all from the same patient, were collected postprandially and exhibited a higher pH. Pearson’s correlation coef cients for saliva versus unbound and total plasma piperacillin concentrations showed a very strong correlation ($R=0.9172$ ($P<0.05$) and $R=0.9449$ ($P<0.05$), respectively). Measured and theoretical S/P ratios were not statistically significant different ($P=0.0541$ for meropenem and $P=0.1602$ for piperacillin).

### Conclusions

A significant correlation was found between saliva and total and unbound plasma concentrations for both meropenem and piperacillin. However, saliva can’t readily serve as a reliable substitute for plasma in beta-lactam antibiotic TDM because of the small sample size of this study. More data are needed to optimize the analytical cut-off. S/P ratios for meropenem and piperacillin were in accordance with the theoretical values.