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ORAL ABSTRACTS

608. Can Rapid Molecular Diagnostics Assist in the Choice of b-Lactam Antibiotics? An Analysis of Data from PRIMERS-II of the Antibiotic Resistance Leadership Group (ARLG)

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Background. In PRIMERS-I, the ARLG assessed the performance characteristics of PCR/ESI-MS, molecular beacons (MB), microarrays, and ion torrent sequencing (IT) to detect b-lactam (b-L) resistance in highly drug resistant *Escherichia coli* (*Ec*) and *Klebsiella pneumoniae (Kp)*. In PRIMERS-II, PCR/ESI-MS and MB tested in a blinded fashion a heterogeneous collection of *Ec* and *Kp* and asked how well these 2 platforms predicted b-L susceptibility (S) or resistance (R).

Methods. S/R to 14 b-Ls were determined (CLSI) using 196 *Ec* and *Kp* isolates. The probabilities of identifying genetic markers of b-L susceptibility/non-susceptibility based on the absence/presence of *bla* genes (vs. MIC phenotype as the standard) were estimated using 95% confidence intervals (CIs) for each b-L for each platform. The performance of each platform was compared.

Results. Select estimated probabilities of detecting genotypic susceptibility/non-susceptibility MIC-defined phenotypes are summarized (table). In a community that has a prevalence of 15% ceftazidime resistance and 5% carbapenem resistance, the susceptibility predictive values (SPV) of PLEX-ID and MB are 100%, and 96% for ceftazidime; 100%, and 99% for imipenem. The non-susceptibility predictive values (nSPV) of PLEX-ID and MB are 69%, and 73% for ceftazidime; 41%, and 50% for imipenem.

Estimated probabilities (95% CIs) of detecting genotypic non-susceptibility (i.e., presence of *bla* genes)

Antibiotic	PCR/ESI-MS	MB
ceftriaxone	1.00 (0.96, 1.00)	0.77 (0.66, 0.85)
ceftazidime	1.00 (0.96, 1.00)	0.77 (0.66, 0.85)
cefepime	1.00 (0.96, 1.00)	0.77 (0.66, 0.85)
piperacillin/tazobactam	0.82 (0.71, 0.91)	0.68 (0.55, 0.78)
imipenem	0.93 (0.84, 0.98)	0.75 (0.62, 0.85)

Estimated probabilities (95% CIs) of detecting genotypic susceptibility (i.e., absence of *bla* genes)

Antibiotic	PCR/ESI-MS	MB
ceftazidime	0.92 (0.85, 0.96)	0.95 (0.90, 0.99)
piperacillin/tazobactam	0.88 (0.80, 0.93)	0.95 (0.90, 0.98)
imipenem	0.93 (0.88, 0.97)	0.96 (0.91, 0.98)

Conclusion. Advancing the findings of PRIMERS-I, detecting R/S genotypes in *Ec* and *Kp* predicts the probability of a corresponding phenotype identified by susceptibility testing. Informed decisions regarding the choice of b-L therapy depends upon the geographic prevalence of *bla* resistance genes

Disclosures. **T. Hall**, Ibis Biosciences, Abbott: Employee, Salary **C. Marzan**, Ibis Biosciences, Abbott: Employee, Salary **R. Sampath**, Ibis Biosciences, Abbott: Employee, Salary **D. J. Ecker**, Ibis Biosciences, Abbott: Employee, Salary **C. Manca**, Public Health Research Institute: Employee and patent US6596281 (also published as US6087163), no financial benefit involved **R. A. Bonomo**, AstraZeneca: Grant Investigator, Grant recipient; Merck: Grant Investigator, Grant recipient; Rib-X: Grant Investigator, Grant recipient; Steris: Grant Investigator, Grant recipient; TetraPhase: Scientific Advisor; NIH: Grant Investigator, Grant recipient; VA Merit Review: Grant Investigator, Grant recipient

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