P1240
Abstract (poster session)

Retrospective search for NDM-1 reveals Indian origin of DIM-1 metallo-beta-lactamase

M. Castanheira*, L. Deshpande, L. Woosley, R. Prochaska, R. Jones (North Liberty, US)

Objectives: To assess the early occurrence of NDM-1 and other carbapenemases in a collection of Gram-negative bacilli (GNB) isolates collected in India during 2000. We previously demonstrated that NDM-1-producing isolates were present in India as early as 2006, but no data is available for prior sample years. Methods: Among 220 GNB isolates collected in India during 2000, 22 strains showing elevated imipenem MIC values (>= 0.5 mg/L) were further evaluated for the presence of carbapenemases. Modified Hodge test (MHT) was performed. Isolates were tested by PCR for genes encoding KPC, IMP, VIM, NDM, SPM, SIM, KHM, DIM, BIC, GIM, SME, IMI, NMC-A, GES and OXA-48. DIM-1-producer was compared to index strain (kindly supplied by L. Poirel, Bicetre Hospital, France) by PFGE and integron structures were amplified using primers located in the conserved sequences (CS). Results: 22 GNB tested belonged to eight bacterial species, including 5 E. cloacae, 4 P. aeruginosa, 4 P. fluorescens, 2 of each K. pneumoniae, A. baumannii, C. freundi, P. stutzeri and one P. vulgaris. These strains were collected in 5 cities: Mumbai, Vellore, New Delhi, Lucknow and Indore. Only one strain yielded positive PCR results for blaDIM primers. No isolates were positive for NDM-1 or other carbapenemase-encoding genes. The P. stutzeri strain carrying blaDIM-1 was genetically distinct from the index P. stutzeri strain carrying this gene previously described in The Netherlands. Integron structure showed that blaDIM-1 was located in the second position of a class I integron downstream of aadB and an intact 3'-CS structure (qacEdelta1/sul1). In contrast the index strain carried blaDIM-1 in the first position followed by aadB and qacH, but no 3'-CS. Conclusions: NDM-producing strains were not detected in this bacterial collection from five Indian cities in 2000, narrowing the interval for the emergence of NDM-producing strains in India. On the other hand, the detection of a DIM-1-producing P. stutzeri from India collected many years prior to the finding of this gene in the Dutch strain, suggests that the Indian subcontinent could be the source of another metallo-beta-lactamase gene. Further studies should be performed to investigate the origin of DIM-1 and its prevalence in India.