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ePoster Viewing
MDR Enterobacteriaceae - a major threat

THE EPIDEMIOLOGY OF CARBAPENEM RESISTANT KLEBSIELLA PNEUMONIAE STRATIFIED BY MULTI-LOCUS SEQUENCE TYPING

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Objectives: In less than a decade, a transposon (Tn4401)-mediated outbreak of *bla*$_{KPC}$ producing *Klebsiella pneumoniae* has disseminated worldwide. The outbreak was initially clonal in most regions, consisting of a single carbapenem-resistant *K. pneumoniae* (CRKP) clone. Multi-locus sequence typing (MLST) identified this strain as ST-258. However, resistance soon emerged in additional MLSTs. Investigations of CRKP have not analyzed the predictors and/or outcomes based on MLST. Study aims were to compare the predictors and outcomes of CRKP ST-258 strains to other MLSTs.

Methods: CRKP isolated from 09/2008 to 09/2009 were analyzed at Detroit Medical Center (DMC). Only unique adult patient isolates were included. *bla*$_{KPC}$ genes were queried by PCR. Extended-spectrum β-lactamase (ESBL) production was determined phenotypically according to established criteria. MLST to determine STs was conducted according to standard criteria (Pasteur Institute, France). Clonal complexes were defined as exact matches or single locus variants (at least 6/7 shared alleles).

Results: Overall 69 unique adult patients with CRKP were recovered during the study period. Sixty-two of the isolates belonged to the clone complex ST-258, and seven consisted of other clones (three belonged to the clone complex ST-514, 2 were ST-11, one was ST-13, and one was ST-248). There were 12 asymptomatic CRKP carriers who were diagnosed by rectal surveillance (11 were ST-258 and one ST-514). Fifty-six (98%) of ST-258 strains were *bla*$_{KPC}$ producers vs. five (71%) of non-ST-258 strains (OR=22.4, p=0.03). Patients with CRKP other than ST-258 were younger and had fewer chronic co-morbidities (Table). Outcomes did not differ significantly between patients with a ST-258 strain vs. other strains (Table). All of non ST-258 CRKP strains (100%) were ESBL-producers, compared to 86% of ST-258 isolates (p=0.2).

Conclusion: The epidemiology of CRKP is continually evolving, and consists also now of non-ST-258 circulating new strains that possesses distinct epidemiological features. The prevalence of ESBL-non-*bla*$_{KPC}$-producing strains of CRKP should be acknowledged and closely monitored. This analysis also illustrates that we cannot rely solely on the presence of *bla*$_{KPC}$ per molecular tests in order to diagnose CRKP on routine basis.

Parameter	KPC-KP ST-258, number (%)	KPC-KP non-ST-258, number (%)	OR (CI-95%)	p value
Age, years, mean ± SD	65.6 ± 15.2	59.3 ± 11.5		0.2
Permanent residency in a long-term acute care facility	33 (59)	1 (14.3)	8.6 (1.1-7.6)	0.04
Tobramycin non-susceptibility	58 (100)	4 (67)		<0.001
Ciprofloxacin non-susceptibility	55 (98)	4 (67)	27.5 (2.1-373)	0.02
Exposure to a carbapenem in the preceding three months	11 (24)	3 (60)	0.2 (0.03-1.4)	0.1
In-hospital death	14 (26)	2 (33)	0.7 (0.1-4.2)	0.7
Length of hospital stay from culture to discharge (excluding the dead), days, median (IQR)	15.2 (4-21)	4.5 (8-13)		0.1