P1081

Abstract (poster session)

**Impact of antibiotic resistance and beta-lactamase carriage on virulence of Klebsiella spp.**

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Objectives: In severe infections, Extended Spectrum beta-lactamases (ESBLs) and expression of various virulence factors may work in harmony, resulting in the treatment failure of Multidrug Resistant (MDR) Klebsiella spp.. It remains somewhat unclear how beta-lactamase carriage affects virulence. We assessed the effects of ß-lactamases and ESBL carriage on the virulence of Klebsiella spp. clinical isolates. Methods: This study included 93 representative clinical isolates of Klebsiella pneumoniae (n=86) and Klebsiella oxytoca (n=7) that were collected between 1980 and 2011. The isolates were characterized in groups according to the ß-lactamases produced, namely TEM, SHV, CTX-M and KPC. The virulence of each isolate was assessed by PCR amplification for 6 virulence genes: k2A (K2 serotype), fimH (fimbrial adhesins type 1), mrkD2 and mrKD3 (fimbrial adhesins type 3), khe (haemolysin) and iucC (aerobactine). A p value of <= 0.05 was used to indicate statistical significance. Average number of virulence factor genes per isolate was calculated. Results: The isolates TEM-type ß-lactamase producers (1980) showed an average number of virulence genes per isolate of 2.0 although the CTX-M-15 ESBL producers (2004-2009) showed 3.0. These results were higher when the Klebsiella spp. isolates are associated with carbapenemase KPC-3 genes (2009-2011), especially KPC-3 coupled with TEM-type, SHV-type and CTX-M-15 that showed an average number of 4.8. Among the KPC-3 producers no significant differences in virulence factor production were found. In the TEM-type isolates (n=5) was identified only khe (4/5, 80%), mrKD2 (3/5, 60%) and mrKD3 (3/5, 60%); The CTX-M-15 isolates (n=40) showed fimH (36/40, 90%), khe (22/40, 55%), mrKD2 (36/40, 90%), mrKD3 (24/40, 60%) and iucC (1/40, 2.5%). Finally the KPC-3/TEM/SHV/CTX-M-15 isolates (n=5) with K2 (3/5, 60%), fimH (5/5,100%), khe (4/5, 80%), mrKD2 and mrKD3 (both with 5/5, 100%) and iucC (2/5, 40%). The presence of K2 serotype and iucC aerobactin in KPC-3 producers Klebsiella pneumoniae isolates was more significant (p<=0.05) than in the other isolates. Conclusions: The presence of ESBL enzymes suggested an association to virulence among the producing isolates. Carriage of KPC-3 carbapenemase enzymes significantly impacts on the virulence of K. pneumoniae isolates producing these enzymes.