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P0935 Virulence and resistance determinants of beta-lactamases and carbapenemases Klebsiella spp. producers from hospital-acquired infections in Portugal: a 30-year overview

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Background: The rapid and complex evolution of resistance mechanisms in *Klebsiella* spp. are one of the most significant current threats to Public Health. However, it remains somewhat unclear how resistance genes carriage affects virulence determinants. The aim of this study is to provide an overview of the virulence and resistance determinants of *Klebsiella* spp. isolates producing β-lactamases and carbapenemases since 1980.

Materials/methods: A retrospective study was performed considering a total of 929 *Klebsiella* spp. isolates. Antimicrobial susceptibility testing was performed by disk diffusion and the results were interpreted according to EUCAST. The β-lactamases including OXA, NDM, CTX-M, TEM, SHV, DHA, FOX, and CMY were screened by PCR and confirmed by sequencing. Representative isolates (n=100) of each resistance profile were then screened for gene virulence factors: K2A, fimH, mrkDV1, mrkDV2-4, khe, rmpA, magA, and iucC by PCR. Clonal relationship was evaluated by M13 fingerprinting and multilocus sequence typing (MLST). Plasmid replicons were determined by PCR-based replicon typing scheme.

Results: A total of 100 isolates were studied, namely: TEM-1 and SHV-1 (n=15), TEM-10 (n=7), -24 (n=5) and CTX-M-15 (n=46) and KPC-3 carbapenemases (n=27). The genes blaDHA, blaCMY, blaIMP, blaVIM, blaNDM and blaOXA were not detected. A multiclonal profile was found and the isolates presented mostly the Inc F, Inc HI1 and Inc A/C replicon typing. ST-15 is the predominant clone in CTX-M-15 and ST-14 in KPC-3. The virulence profile (fimH, mrkDv1, khe) was shared by all β-lactamases, indicative of an important role of fimbrial adhesins type 1, type 3 and hemolysin. In addition, KPC-3 isolates also showed significative prevalence of the capsular serotype K2 and aerobactin iucC.

Conclusions: The virulence determinants are not conditioned by the β-lactamase produced. However, we firstly report an uncommon and concerning overlap of multidrug-resistance and accumulation of virulence genes in the prevalent ST-14 clone identified in KPC-3 carbapenemase producers. The combination of the KPC-3 gene with virulence genes as K2 capsular serotype, fimbrial adhesins, haemolysin, and aerobactin - a bacterial iron chelating agent, can constitute a serious threat, especially for vulnerable populations and can exacerbate infections caused by this pathogen.