

البحث الاول:

A Study of the Virulence Traits of Carbapenem-Resistant *Klebsiella pneumoniae* Isolates in a *Galleria mellonella* Model

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Abstract:

The increasing incidence of carbapenem-resistant *Klebsiella pneumoniae* (CRKP) strains is considered as a terrifying public health concern. This study target was to gain a further insight into the virulence traits of CRKP isolates in Egypt. The study was carried out by using 43 clinical *K. pneumoniae* isolates. Antibiotic susceptibility testing, biofilm formation assay, and molecular characterization of carbapenemase and virulence genes were done for all isolates. In addition, the genotypic relationship between CRKP isolates was identified by using

enterobacterial repetitive intergenic consensus-polymerase chain reactions (ERIC-PCRs). A *Galleria mellonella* survival assay was adopted for in vivo testing of virulence of the CRKP. Carbapenem resistance was exhibited among 58% (25/43) isolates. Minimum inhibitory concentration values of carbapenem-resistant *K. pneumoniae* (CRKP) ranged from 32 to 128 mg/mL. Biofilm assay has revealed that 21 isolates (49%) had moderate biofilm formation and 11 isolates (25.5%) were strong biofilm producers. BlaNDM-1 was recognized in 20.9% (9/43) of the isolates, while blaOXA-48 was observed in 18.5% (8/43). Type 3 fimbriae (mrkD) and entB were addressed among 72.1% and 62.8% of *K. pneumoniae* isolates, respectively. The ybtS and iutA genes were detected among 44.2% and 37.2% of the isolates, respectively. ERIC-PCR showed 23 genetic profiles among CRKP isolates. CRKP biofilm producers were virulent according to the *G. mellonella* model, which indicates the importance of biofilm as a virulence trait among CRKP. This study indicates the emergence of CRKP with increased virulence traits, especially biofilm formation, in Egypt. This alarming report highlights the ongoing need for effective screening procedures and strict infection control measures.