TITLE: BIOLOGICAL CHARACTERIZATION OF *Klebsiella pneumoniae* STRAINS ISOLATED FROM A PATIENT WITH BACTEREMIA

AUTHORS: GONÇALVES, L. F.[1], PITONDO-SILVA, A.[2], ALMEIDA, A.P.C.[1], SOUSA, I.F.A.[1], MOREIRA-DA- SILVA R.C.R.[1], MARTINS, V.P.[1], MAGALHÃES, K.G.[1], CAMPOS, T.A.[1]

INSTITUTION: 1. DEPARTAMENTO DE BIOLOGIA CELULAR, INSTITUTO DE CIÊNCIAS BIOLÓGICAS, UNIVERSIDADE DE BRASÍLIA (UNB), 2. DEPARTAMENTO DE ANÁLISES CLÍNICAS, BROMATOLÓGICAS E TOXICOLÓGICAS, FACULDADES DE CIÊNCIAS FARMACÊUTICAS DE RIBEIRÃO PRETO, UNIVERSIDADE DE SÃO PAULO (USP).

ABSTRACT:

Klebsiella pneumoniae is a Gram-negative bacillus commonly associated with antimicrobial resistance dissemination and with infections in immunocompromised individuals. There are some strains that harbor virulence factors that allow them to cause serious diseases. The association of antimicrobial resistance and virulence cause great concern due to the restricted options for treatment. In this study, we characterized three strains of *K. pneumoniae* isolated from a patient at Hospital Universitário de Brasília (HUB / UnB) with bacteremia: one from blood culture (Kp 31), one from rectal swab culture (Kp 32) and a nasal swab culture (Kp 34). All the strains had their ERIC-PCR (enterobacterial repetitive intergenic consensus sequences) profile, MLST (multilocus sequence typing), antibiogram, hipermuscoviscous phenotype, biofilm production, HEp-2 cells citotoxicity and invasion ability and, lastly serum and blood survival capacities characterized. Among them, Kp 32 and Kp 34 presented a hipermucoviscous phenotype and the three strains were defined as strong producers in the biofilm assay. The antibiogram analysis showed that all strains are XDR (extreme drug resistance) since they presented sensitivity to only two classes of antimicrobials tested. Besides that, PCR for resistance genes detected KPC and VIM in all the three isolates and extended-spectrum beta-lactamases as SHV and TEM in Kp 32 e Kp 34. The clonal analysis done by ERIC-PCR indicated that the strains belonged to ST11 and they are genetically identical. HEp-2 cells viability assay with epithelial cells by using MTT (3-(4,5Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) showed that Kp 32 and Kp 34 reduces the cell viability significantly in three and six hours. The survival assay of the strains in HEp-2 cells indicated that in three, six and 24 hours post infection all the isolates survive inside the cells. Kp 32 was also able to survive and multiplied in human blood and in human serum beyond Kp 32, Kp 34 also survived and multiplied. All together the results suggest that all isolates from presented virulence features as high citotoxicity and showed capacities to survive in epithelial cells, serum and blood. The high dissemination potential of the ST identified and the resistance XDR profile exhibited by these strains increases the concern about their dissemination.

KEY WORDS: *Klebsiella pneumoniae*; antimicrobial multiresistance; bacteremia.

FINANCIAL SUPPORT: CNPq, FAP-DF, FAHUB.