TITLE: CHARACTERIZATION OF *KLEBSIELLA PNEUMONIAE* STRAINS ISOLATED FROM EPITHELIUM SWABS, BLOOD AND ASPIRATES FROM PATIENTS AT HOSPITAL UNIVERSITÁRIO DE BRASÍLIA (HUB/UNB)

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ABSTRACT

Klebsiella pneumoniae is a Gram negative enterobacteria mainly associated with infections among immunocompromised patients at hospitals and other health facilities. By the 1980s, a hypervirulent strain associated with pyogenic liver abscesses acquired in the community has emerged. This strain presented a hypermucoviscuous phenotype associated with hypervirulence, features that combined with antimicrobial resistance are consider a huge danger for public health. The focus of this work was to characterize 20 strains *of Klebsiella pneumoniae*, isolated at Hospital Universitário de Brasilia (HUB/UnB) in regard to hypermucoviscosity phenotype and other virulence characteristics like biofilm production and blood and serum survival capacities. The antibiogram analysis performed by using the Kirk-Bauer disc diffusion method was also included. 47% of the strains were sensitive to all antibiotics tested, 18% were resistant to at least one antibiotic tested. In addition, 35% were resistant to at least 3 classes of the antibiotics tested (MDR). In order to analyze the production of biofilm, we performed a spectrophotometric assay with all 20 strains in triplicate. The mean of each triplicate was compared with the mean of a negative control. 75% of the strains have a strong capacity of producing biofilm, 10% have a moderate capability, 5% have a weak capacity, and 10% do not produce biofilm. We also performed the hypermucoviscosity assay to determine which strains showed this phenotype: three strains (15%) tested were positive. Lastly, we performed two assays to test the ability of those strains to survive in human blood and serum. We observed that most strains, excluding one (Kp 35), were able to survive and even grow in both blood and serum. Furthermore, it seems that those strains survive better in serum than in blood. Based on all these results, we observed that there were some strains harboring virulence capacities (as hypermucoviscosity, biofilm production and blood and serum survival) among the isolates analyzed. Strains that were identified as multi-resistant, in addition of being strongly able to produce biofilm constitute a concern and need greater attention in hospital areas.

Keywords: *Klebsiella pneumoniae,* Biofilm production, Hypermucoviscosity, Serum and blood survival.

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