

Title: Qualitative Analysis of morphological structures of produce biofilm on abiotic substrates by *Corynebacterium* spp.

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Abstract

Some *Corynebacterium* spp. has been associated with an increasing number of fatal infections such as: sepsis, endocarditis, meningitis, osteomyelitis, are called pathogenic microorganisms with the ability to produce nosocomial outbreaks. We were aiming to analyze by electron scanning microscopy (SEM) of biofilm formation on abiotic substrates by strains by *Corynebacterium* spp. more incident in University Hospital in Rio de Janeiro city in the period between January 2012 and January 2018. The biofilm formation was performed by CFU quantification and according to previously described to the surface of glass and polyurethane, glass slides and catheters fragments were inoculated by immersion in 10⁶ CFU.ml⁻¹ bacterial suspension in Trypticase Soy Broth and incubated at 37 ° C / 48h. To quantitative evaluation, the biofilm was then extracted by abrasion and quantified by CFU count. To structural analysis, sections of glass coverslips and polyurethane catheters were fixed in 2.5% glutaraldehyde, post-fixed in 1% osmium tetroxide solution and dehydrated in ethanol gradient. Subsequently catheter segments were submitted to critical point drying with carbon dioxide, covered with 10nm gold layer and examined with a JEOL JSM 5310 scanning electron microscope. Results: The results revealed that the most isolated specimen in the study was *Corynebacterium striatum* (37.61%) out of a total of 105 samples identified by Maldi-tof (n = 109). From the samples of *C. striatum* tested to be able to adhere to hydrophilic (glass) and hydrophobic polyurethane, the abiotic surfaces at different intensities, Additionally, the strains showed biofilm formation in the polyurethane catheter surface 48h post-incubation and maturation of the biofilm resulting in a complex architecture with channels and pores that formed their three-dimensional structure and the presence of extracellular matrix. Conclusion all samples tested adhere on substrates tested at different intensities and their complex structure has several characteristics that show the present of mature biofilm. Discussion: From these results, effective and appropriate measures should be taken to control this hospital environment and thus decrease the incidence of outbreaks caused by CIM.

Keywords: *Corynebacterium*, virulence potential, analysis, incidence and biofilm.

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