

Title: EFFECT OF COLD ATMOSPHERIC PLASMA JET ON ADHERENCE OF CANDIDA ALBICANS TO EPITHELIAL CELLS

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Abstract:

The antimicrobial effect of cold atmospheric plasma jets has been reported with promising results. Charged particles, reactive molecules and UV radiation are the main components of plasma jets, which can compromise membrane integrity and interact with intracellular molecules (proteins and DNA). This study evaluated the effect of plasma jet (in sub-inhibitory exposition times) in preventing *Candida albicans* adherence to epithelial cells. Suspensions of *C. albicans* SC 5413 (10^6 cells/ mL) were exposed to helium-plasma jet (99,5%; flow 5.0 L/min; power 1.8 W) for 30 and 60 seconds at a distance of 1.5 cm from the beginning of the device and the surface of cell suspension. Control group was exposed to helium flow without plasma ignition. To evaluate *C. albicans* adhesion to oral epithelial cells, health donors were selected and the oral cells were collected from the buccal mucosa. This protocol was approved by CONEP (CAAE 31787814.1.0000.0077). Epithelial cells were washed 3 times in phosphate saline buffer (1500 rpm) and added to *C. albicans* suspensions exposed or not to plasma jet. After incubation for 1 hour (37 °C, 70 rpm), epithelial cell were washed 5 times to remove non-adhered *C. albicans* cell. Then, aliquots of epithelial cells were transferred to microscope slides and they were stained with crystal violet and Papanicolaou stain. The number of *C. albicans* cells adhered to 25 epithelial cells was determined by microscopy observation. Experiments were performed in triplicate in three different occasions. The number of cells exposed to plasma jet (30 and 60 seconds) adhered to epithelial cell were significantly lower than control group (30 seconds: p<0.01; 60 seconds: p<0.001; Kruskal-Walis/Dunn). Therefore, we observed that 30 and 60 seconds of exposition to helium-plasma jet did not compromise *C. albicans* viability but could inhibit the first step of *C. albicans* infection: the adhesion to epithelial cells.

Key-words: Adherence, *Candida albicans*, plasma jet

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