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REAL-TIME ANTIFUNGAL PHOTODYNAMIC THERAPY IN ENDODONTIC INFECTION: A LIGHT PROPAGATION STUDY

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Background: Photodynamic therapy (PDT) can be an interesting and innovative antifungal approach. Several studies have demonstrated positive antifungal activities of PDT, but some discrepancies can still be found in the literature and PDT parameters certainly lack consistency. In this work we developed a model of *Candida albicans* biofilm infection inside dental root canal to evaluate microbial reduction and light distribution into the root canal system using different light delivery methods to perform the irradiation.

Study: After conventional endodontic treatment ten teeth were sterilized and the canals were contaminated with genetic engineered bioluminescent *C. albicans* to form a 3 days biofilm. The samples were divided into two groups one using laser tip in contact with the root canal entrance and the second using a diffuse fiber to perform irradiation. Images of the irradiated area were obtained during irradiation and microbial reduction was monitored via bioluminescence.

Results: Our findings demonstrate that the bioluminescent biofilm shows good reproducibility, the images can be easily accessed and allow several repetitions in the same sample.

Conclusion: Light distribution in dental tissue was markedly dependent on the irradiation device and this parameter is directly related with microbial destruction.

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UPTAKE OF METHYLENE BLUE PHOTSENSITIZER IN LEISHMANIA AMAZONENSIS

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Background: *Leishmania spp.* is an important parasite that causes several neglected diseases such as cutaneous leishmaniasis. There are few studies that have demonstrated a significant effect of some photosensitizer during photodynamic therapy (PDT). Phenothiazines like methylene blue (MB) have an important photosensitizing activity against microorganisms. However, the literature is scarce about uptake of photosensitizer molecules into parasites. In this study we evaluate the influence of contact time and photosensitizer concentration using MB and investigate the *L. amazonensis* promastigotes interaction with the dye via MB uptake evaluation.

Study: Tubes with 1.10^7 *L. amazonensis* promastigotas were incubated with 50 μ M, 100 μ M, 250 μ M and 500 μ M of MB, tested in three different times (10, 30 and 60 min) of incubation. Afterwards, tubes were washed once with PBS 0.1 M followed by incubation with lise solution (1:1 - NaOH 2 M and SDS 2%) overnight. The MB fluorescence was measured at $\lambda = 690$ nm with excitation at $\lambda = 532$ nm using a spectrophotometer. Statistical analysis of the data was performed using Student's *t* test and $p < 0.01$ was considered significant.

Results: Our results showed no statistically significant differences among the tested groups regarding contact time.

However increasing dye concentration promotes further enhancement on uptake values.

Conclusion: These findings suggest that high methylene blue concentration at short incubation times could be used to test photodynamic activity against *L. amazonensis*.

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EVALUATION OF VARIABLES INVOLVED IN ANTIFUNGAL PHOTODYNAMIC THERAPY

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Background: In vitro studies have demonstrated positive antifungal activity of photodynamic therapy (PDT), but employment of this treatment in vivo requires optimization of the variables involved. In this work we investigate the fungus and photosensitizer (PS) distribution as well as light propagation in a mice model of vaginal candidiasis (VC).

Study: Twenty female Balb-c mice were treated subcutaneously with estrogen 72 h before intravaginal inoculation of *Candida albicans* to establish a persistent infection. Vaginitis was verified by histological and microbiological evaluation after 5 days. With the infection induced we investigated fungal localization by bioluminescence and photosensitizer distribution by fluorescence. Light propagation into vaginal canal was also analyzed. To test PDT, methylene blue (500 μ M) was topically applied intravaginally for 10 min. before irradiation. The vaginal area was illuminated using a 660 nm-red laser (P = 100 mW, E = 3J) during 6 min. Samples were collected from vaginal content for microbiological counting.

Results: Our findings show that the fungal colonization was localized mainly into the vaginal canal. PS was observed on the vaginal canal mucosa and on biofilm surface. The use of an optical fiber allowed a better light distribution inside the vaginal canal. A decrease of fungal burden of 1 log after PDT was observed.

Conclusion: Therefore, although the dye and light distribution covered the whole infection site other parameters have to be taken into account to improve microbial reduction.

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CLINICAL RESPONSE OF HIDRADENITIS SUPPURATIVA TO PHOTODYNAMIC THERAPY USING TETRACYCLINE AND RL50[®] LIGHT SOURCE

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Background: The Hidradenitis suppurativa is a chronic, inflammatory, debilitating and recurrent follicular skin disorder due to inflamed lesions in the apocrine gland bearing skin of body and most commonly the axillary, inguinal and anogenital regions that needs a great number of approaches to reduce the extent and progression of the disease. The aim of this study is the application of PDT, a not debilitating therapy, allowing spacing of the outbreaks and functional maintenance of the affected region.