Metabolic Activity of *Streptococcus mutans* Biofilm Using Photodynamic Therapy

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Streptococcus mutans is the main caries forming organism, due to its acidogeny, acidurance and biofilm forming capacity. In Photodynamic Therapy (PDT), a visible light, a photosensible dye and oxygen interacts to produce some reactive oxygen species (ROS) will initiate a cascade of event to induce cellular death or inactivation. Thus, the objective of this work was to evaluate the effect of PDT on the metabolic activity of *Streptococcus mutans* biofilm using Rose Bengal (RB) and Eosine as photosensible agents. *S. mutans* biofilm was grown in 24-well plates and treated with drug only (Rose Bengal or Eosine) or drug followed by light (photopolimerizator or LED). A control group was treated with saline solution. The efficiency of the treatment was measured through the metabolic capacity from biofilm (expressed as a ΔpH in comparison to the control group). The best concentration of RB was 6.6×10^{-7} mol/L followed by irradiation of 1 minute with photopolimerizator or LED (ΔpH of 0,6 and 0,7 respectivelly). For Eosine, the best concentration tested was 0.8×10^{-7} mol/L, (also followed by 1 minute of irradiation), but with a ΔpH of 0.6 and 1.11 respectively for photopolimerizator and LED. Thus, we conclude that the use of Eosine associated with LED irradiation leads to a higher bacteriostatic effect on *S. mutans* biofilm. Overall, the results showed that the bactericidal effects of PDT was higher in plancktonic cells then compared to *S. mutans* grown in biofilm.

Key words: Photodynamic Therapy; *Streptococcus mutans;* Rose Bengal; Eosine

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