Evaluation of antibacterial effects of 5-aminolevulinic acid in combination with light emitting diode (LED: 635nm) with different disinfection methods

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Abstract

This study evaluates the in vitro antibacterial effects of 5-ALA (photoactive dye) in regard to different disin- fection methods (2% Chlorhexidine gluconate, 1% Sodium Hypochlorite) on cariogenic bacteria (Streptococcus mutans and Streptococcus sobrinus). After inoculation of dentin specimens with S. mutans and S. sobrinus sepa- rately, the reduction in bacterial count was evaluated by the colony counting method. A total of sixty specimens were assigned to six groups (Ten per each group, with five in each group inoculated with S. mutans and the other five inoculated with S.sobrinus); group one: positive control where no treatment was performed, group two: 1% NaOCl was applied, group three: 2% CHX was used, group four: 5-ALA with LED light (635 nm) was applied, group five: 5-ALA was used without LED light activation, group six: LED light was used without dye application. There was a significant reduction in the number of S. mutans in the group treated with 5-ALA with LED light, followed by CHX and then NaOCl, whilst minimum bacterial reduction was detected in the groups that were treated with LED light alone and 5-ALA without LED. However, NaOCl exhibited a better effect regarding re- duction of S. sobrinus, followed by 5-ALA and LED light and then CHX. All the disinfected groups showed a

significant relation with the positive control non-treated group($p < 0.05$).