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Photo-disinfection of Orthodontic Brackets Contaminated with *Lactobacillus acidophilus* with Blue Laser Authors

Abstract:

Decontamination of teeth with Chlorhexidine (CHX) in the treatment of dental disease is associated with some concerns. The objective of the current study was to ascertain whether the Blue Diode Laser (BDL), as a new approach in combination with riboflavin and curcumin as photosensitizers, would have any impact on the number of *Lactobacillus acidophilus* around orthodontic brackets. A total of 36 orthodontic brackets were contaminated with *L. acidophilus* and categorized into six different groups, including the negative control, riboflavin alone or riboflavin + BDL with a radiant power of 500 mW, and curcumin alone or curcumin + BDL with a radiant power of 500 mW, and 0.2% CHX as positive control. Orthodontic brackets were irradiated with a BDL (wavelength of 450 nm) and radiant exposure of 30 J/cm² for 30 s. Colony-forming units per milliliter (CFUs/ml) were determined. One-way Analysis Of Variance (ANOVA) followed by Tukey's post-hoc tests were performed to compare CFU/ml between groups. All groups were better at eliminating *L. acidophilus* around orthodontic brackets than the negative control group, but this was not significant for riboflavin alone. The curcumin groups were more effective than the riboflavin groups at reducing CFU/ml of *L. acidophilus*. In addition, CHX was able to completely eliminate the colonies of *L. acidophilus* ($p <0.0001$). This study showed that curcumin and riboflavin plus BDL significantly reduced the amounts of *L. acidophilus* around the orthodontic brackets.

Biography

Trife Ghasemi earned her Doctor of Dental Surgery in 2019 from Islamic Azad University and completed a Dental Laser Fellowship in 2022 at the University of Genova in Italy. She serves as the technical manager of Bozorgmehr Dental Clinic. In addition to her clinical practice, Dr. Ghasemi engages in scientific writing and research in dental fields to enhance her knowledge and improve patient treatment. She has published two papers in reputable journals.