

Thursday, 4:20 p.m. – 4:40 p.m. Salon 5

DR. EUGENE SEIDNER STUDENT SCHOLAR:

Antimicrobial Effects of an 810-nm Diode Laser in the Treatment of Peri-Implantitis: A Pilot Study

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Introduction and Objective

Peri-implantitis is a condition associated with presence of bacteria along the surfaces of implants, creating deleterious effects to the peri-implant hard and soft tissues. This *ex vivo* pilot study compared three settings on an 810-nm diode laser to determine optimal laser energy levels to suppress bacteria growing in a bony defect adjacent to implant.

Materials and Methods

Fourteen sterile titanium implants were placed into sterilized porcine ribs. A 2 mm x 2 mm wide, 3 mm deep defect adjacent to the implant was created. Three microliters of *S. sanguinis* ATCC 10556 in ½ brain heart infusion (BHI) were inoculated into the defect and left for 24 hours in 5% CO₂ at 37°C. Four defects were not treated with the laser, and 3 were treated with the laser (Odyssey® 2.4G, Ivoclar Vivadent, Amherst, N.Y., USA) at 0.6 W, 4 at 0.8 W, and 3 at 1.0 W. The laser tip was noninitiated and laser energy was delivered in continuous mode. Defects were rinsed with ½ brain heart infusion (BHI) transport media and bacteria were plated on tryptic soy agar (TSA) media and left for 48 hours to grow. The colony-forming units (CFUs) were counted. The experiment was repeated three times.

Results

The amount of growth was generally scattered within the 0.6 W and 0.8 W, with an average count of CFUs of 80.6 and 54.5 respectively, whereas the 1 W group showed no detectable growth. The control group showed an average CFU count of 207 ($P < 0.5$), with the differences in the 1 W group being statistically significant.

Conclusions

The 810-nm diode laser at 1 Watt was successful in suppressing bacteria growth in *ex vivo* peri-implantitis defects, whereas minor laser energies were able to remarkably diminish the amount of bacteria. One Watt of laser power could be an effective setting to use when treating peri-implantitis cases.

Note: This presentation discusses investigational devices that have not yet received U.S. FDA approval or clearance for the specified clinical indications, or describes off-label uses.

Educational Objectives

1. Decide whether a minimal laser energy exposure could be sufficient in eliminating pathogens.
2. Project what 810-nm laser parameters settings could be effective in treating peri-implantitis.