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Congress Program

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27th DGL ANNUAL MEETING

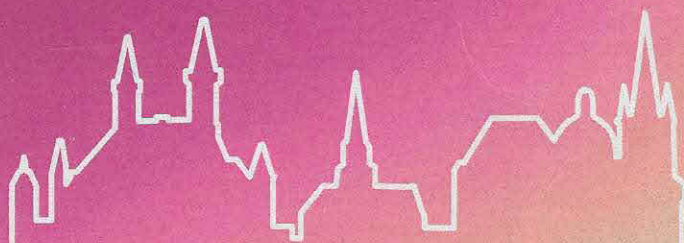


World Academy for
Laser Education in Dentistry

**6th INTERNATIONAL
WALED CONGRESS**



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**16TH LASER DENTISTRY
WORLD CONGRESS
AACHEN**

THREE DECADES
OF LASER INNOVATION
1-3 OCTOBER 2018



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Wednesday 3 October HALL 4 (Hörsaal 4) 11:30 - 13:30

P54

Photodynamic laser therapy with natural photosensitizers.

Laura Monica Rusu*, Marioara Moldovan, Radu Chifor, Alina Rotar, Codruta Sarosi, Rahela Carpa, Mandra Eugenia Badea

1) Introduction:

Photodynamic therapy is currently widely used in the prophylaxis and treatment of plaque-induced inflammation without the risk of developing resistance. The aim of this study was to evaluate the antimicrobial activity for four experimental photosensitizers based on natural compounds.

2) Material and methods:

The microorganisms used in this study were *Streptococcus mutans* (ATCC 25175) and *Candida albicans* (ATCC 10231). The photosensitizers tested are gels mixed with various essential oils, divided in 5 groups: 1 - Curcuma longa (curcumin); 2 - Origanum vulgare (oregano) essential oil; 3 - Thieves (a mixture of essential oils); 4 - Boswellia Carteri (incense) essential oil and 5-Methylene blue. In this regard, the antimicrobial effect of new revealing agents was compared to commonly used products, such as methylene blue. For these samples the gel-soaked disc method was applied to the solid culture medium. The antibacterial effect for the experimental photosensitizers has been evaluated with laser phototherapy, at 660 nm wavelength (Helbo Photodynamic Systems GmbH&Co.).

3) Results:

Most revealing agents that were included in this study showed antimicrobial activity for both *Streptococcus mutans* strain and *Candida albicans* strain. It was observed that after 24 hours of incubation, inhibition zones appeared for both bacterial strains, but not for all the test samples.

4) Conclusion:

Dental plaque is the first phase in the development of dental diseases. Elimination of pathogenic microorganisms on tooth surface is fundamental in preventing and controlling dental diseases, so using different photosensitizers based on natural compounds can play an important role in removing plaque.

Acknowledgements: This work was supported by Romanian Project PNIII no. 142-PED/2017

P55

Intraoral fluorescence camera and high power laser in precavital caries.

Myriam Amparo Pulido Rozo*, Maria Bernarda Mondol Ballesteros

Introduction: Dental caries is one of the most prevalent oral diseases. Conventional diagnos-

tic methods consist of clinical examination, use of explorer and radiographic examination, which have low sensitivity and are not very efficient in precavital lesions of dental caries. Case presentation: In this article we present the cases of tooth 36, 37 and 45 that were evaluated with an ICDAS code 0, that is, absence of caries, later we proceeded to verify this visual diagnosis through the use of intraoral fluorescence camera Durr Dental, obtaining values of blue color (1,1- 1,2 - 1,3) in the three tooth, which shows the presence of incipient caries on the occlusal surface located in enamel according to the rating scale suggested by this technology. It was treated by applying high power diode laser of AsGaAl (2W) for 30 seconds at the level of pits and fissures of those tooth. Results: Finally, it was evaluated with intraoral fluorescence camera to verify the presence of changes in the dental surface, noticing decrease in the values and their frequency, which shows that the treatment with the high power laser was successful. Control was performed one month later, observing grade 0 values, which indicates the absence of dental caries. Conclusion: This case report revealed that the implementation of the intraoral fluorescence camera with the high-power laser are an excellent alternative for the incipient diagnosis of dental caries and its timely treatment.

P56

Evaluation of a clinical preventive treatment using Er,Cr:YSGG (2780 nm) laser on the susceptibility of enamel to erosive challenge.

Konstantinos Tzimas*, Dimitrios Dionysopoulos, Kosmas Tolidis, Dimitris Strakas, Thrasylvoulos Sfeifos, Effrosyni Tsitrou

Purpose: The purpose of this in vitro study was to evaluate the effect of a clinical preventive treatment using Er,Cr:YSGG laser irradiation on bovine enamel susceptibility after erosive challenge. Methods: Twelve sound bovine incisors were used for this study. Two experimental groups (n=12) were assigned as follows: Group 1 was the control group and in Group 2 the enamel specimens were irradiated with an Er,Cr:YSGG (2780 nm) laser system for 20 sec, with average output power of 0.25 W, pulse repetition rate at 20 Hz without water or air flow and the pulse duration was fixed at 140 µsec. The specimens were submitted to erosive challenge using a common soft drink. Surface microhardness changes, surface roughness changes and surface loss were evaluated after erosive challenge. SEM and EDS analyses were also performed on enamel surfaces. The data were statistically analyzed using one-

way ANOVA and Tukey's post-hoc test at a level of significance $\alpha=0.05$.

Results: Er,Cr:YSGG laser-treated enamel exhibited significantly lower decrease in surface microhardness and significant lower surface loss compared to control enamel after the erosive challenge ($p<0.05$). SEM and EDS analyses showed differences in enamel morphology and composition after laser irradiation. Conclusions: Er,Cr:YSGG laser treatment may be promising for the limitation of enamel erosive tooth wear induced by excessive consumption of soft drinks. Clinical studies are needed to clarify whether this protective effect is clinically significant.

P57

Nd:YAG laser irradiation of darkened dental enamel by means of dentifrice use.

Daísa L. Pereira, Gabriela V. Gomes, Vanessa M.L. Sugahara, Marcos A. Scapin, Patricia A. Ana, Ana C.C. Aranha, Claudia B. Zamataro*, Denise M. Zezell

As the world population is growing older, dental erosion became a real concern on dentistry. Optical Coherence Tomography and X-Ray fluorescence were used to analyze enamel samples covered by black dentifrice as photoabsorber irradiated with Nd:YAG laser, then submitted to an erosive cycling. Heat injury risk in deeper tissue decreases because of the dentifrice dark pigment, when the most of photons are absorbed in the surface. Sixty 8mm2 blocks of bovine enamel, were randomized into 4 groups: G1- untreated; G2- treated with acidulated phosphate fluoride (APF, [F]=1.23%, pH=3.3 to 3.9); G3- irradiated with Nd:YAG laser (1064nm, 0.6W, 10Hz- Lares Research®) using a coal paste as photoabsorber; G4- irradiated with Nd:YAG laser (1064nm, 0.6W, 10Hz), using a black dentifrice (Black is White, Curaprox®). All samples were submitted to a 3-day erosive demineralization (Citric acid 1%, pH=3.6, 5min, 2x/day) under agitation, and remineralization cycling (artificial saliva, pH=7, 120min). After treatments and pH cycling, the [Ca]/[P] ratio decreased in the laser irradiated groups. The samples were evaluated by OCT before and after treatment and after erosive cycling. OCT measurements found smaller lesion depths in laser irradiated groups than in the other groups and there were statistically significant differences between G3 and G4 groups ($p<0.05$). Heating promoted by Nd:YAG laser irradiation changed the morphological and crystallographic enamel surface properties and has shown to be a promissory alternative to prevent erosion.

P58

Class V preparation in 44 & 45, bond preparation and gingival contouring with Er,Cr:YSGG (case report).

Alshaimaa Alnaggar*, Mohamed Mahmoud

Erbium laser appliances remove dental tissues selectively by evaporating water in carious tissue, so selective caries removal is advantage specially in class v preparation to avoid harming the pulp, In this case report we used Er,Cr:YSGG (2780nm), for class v preparation first and second lower premolars (5.5W,15Hz,80%water,60%air,tip MZ8 gold), bond prep(4.5W,50Hz,80%water,60%water) and gingival contouring(2.5W,50Hz,10%water,10%air), Patient agreed to start cavity preparation without a local anaesthetic, additionally used Er,Cr:YSGG in hemostasis after gingival contouring, whole duration of procedure was not exceed 10 min. Followed up the case after 1 week The results were fast, painless procedures, satisfied patient and healthy healed gingivae. Conclusion: Er,Cr:YSGG (2780 nm) can perform multitask procedures without consuming time, furthermore superior results compared to conventional methods.

P59

Effects of Er,Cr:YSGG laser and a bioactive glass on root caries remineralization.

Helenice Y. Yoshikawa, Juliana K. M. B. Daguano, Daísa L. Pereira*, Denise M. Zezell, Patricia A. Ana

Considering the aging of the population, the greater exposure of the root surfaces and the higher caries risk in these surfaces, the development of strategies that efficiently remineralize root caries lesions in a long-lasting way is strictly necessary. This in vitro blind randomized study evaluated the potential of remineralization of root caries lesions promoted by Er,Cr:YSGG laser irradiation (2.78 µm) associated with a bioactive glass (Biosilicate®). 60 bovine root dentin slabs with incipient caries lesions were distributed in 6 experimental groups (n=15), in order to be treated with laser irradiation (0.25W, 12.5 mJ/pulse, 2.8 J/cm², 20 Hz, without refrigeration), application of Biosilicate® or association of both. After the treatments, the samples were subjected to an 8-day pH-cycling regimen, and further evaluated by Fourier transformed infrared spectroscopy (FTIR), optical coherence tomography (OCT) and scanning electron microscopy. The data were statistically analyzed at a