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Periodontal tissue status after photodynamic therapy with EGCG incorporated liposomal particles

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Statement of the Problem: The fundamental principle of the treatment of periodontal diseases is antimicrobial therapy. Laser treatment has a positive impact. Today, one of the methods of periodontitis treatment using lasers is antibacterial photodynamic therapy, which allows to reduce the number of periodontopathogens, activate the synthesis of nucleic acids (DNA, RNA), enzyme activity, and redox reactions. Green tea reduces metalloproteinases activity and is a possible photosensitizer. The purpose of this study is to use the natural photosensitizer – green tea active component closed in liposomal particles and blue laser light applied directly into subgingival area. Methodology & Theoretical Orientation: The preliminary stage of the study included 17 patients with chronic periodontal disease of moderate severity. The studies were conducted by quadrants in the same patient. In one quadrant, only the EGCG gel was applied, in the other, irradiation was performed after the pre-applied gel, in the third, only a laser was used. The course of treatment included three sessions with an interval between sessions of 3-4 days. After completion, microbiological samples were taken from the control pockets of each quadrant. The patient was given general recommendations for correcting oral hygiene. They were invited for a follow-up examination after 3 months. Findings: Statistically significant reductions of the bacterial counts were observed in all experimental groups in comparison with the initial value before treatment ($p < 0.05$). Highest reduction occurred in group 3 (laser), which was statistically significantly higher than the initial value before treatment ($p=0,00029$). Second highest reduction of the bacterial count was observed in group 1 (EGCG). Conclusion & Significance: Thus, the use of green tea extract and its main component EGCG alone or in combination with low-intensity blue and red laser radiation can have great prospects in the treatment of patients with chronic periodontitis.

	Before treatment	EGCG	EGCG + Laser	laser
Mean	3,11E+10	1,62E+09	2,53E+09	1,25E+09
Median	7,70E+09	6,60E+08	1,30E+09	6,30E+08
Minimum	1,40E+09	5,10E+06	2,10E+07	1,40E+07
Maximum	1,70E+11	1,50E+10	1,30E+10	7,80E+09
SD	4,64E+10	3,52E+09	3,74E+09	1,88E+09

Recent Publications

1. G. Hajishengallis; T. Chavakis. Local and systemic mechanisms linking periodontal disease and inflammatory comorbidities. Nat Rev Immunol. 2021, 21(7), 426–440.

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2. M.A. Lopez; P.C. Passarelli; M. Marra et al. Antimicrobial efficacy of photodynamic therapy (PDT) in periodontitis and peri-implantitis: A systematic review. *J Biol Regul Homeost Agents*. 2020, 34 (5 suppl 3), 59-65.
3. N.S. Soukos; S. Som; A.D. Abernethy; K. Ruggiero; J. Dunham; C. Lee et al. Phototargeting oral, black-pigmented bacteria. *Antimicrob. Agents Chemother*. 2005, 49, 1391-6.

Biography

Marzena Liliana Wyganowska. A specialist in periodontics and aesthetic medicine with many years of experience. Currently she is the head of the Medical University of K. Marcinkowski in Poznań at the Medical Faculty of the Department of Oral Surgery and Periodontology. Her passion focuses on the processes of biostimulation and bioregeneration of tissues. She conducts research on the biology of fibroblasts in relation to natural substances and biostimulants. An author of over 120 publications in national and foreign journals. respected opinion leader, trainer, and speaker at national and international anti-aging medicine congresses. Specializes in treatments that restore biological balance.

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