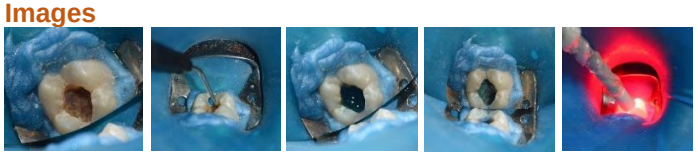
Can antimicrobial photodynamic therapy be an effective alternative to antibiotics for the treatment of local and systemic infections in humans?

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Abstract

Statement of the Problem: Antibiotic resistance is a persistent problem in the vast majority of hospitals and outpatient's clinics around the world. The main goal of this work is to present the most recent findings regarding antimicrobial photodynamic therapy in the treatment of local and systemic infections in humans and how this therapy can possibly combat the growing problem of antibiotic resistance. **Methodology:** this work was divided in two parts: in the first one, we conducted a small review of the literature to identify cases were the main problem was centered on antibiotic resistance, systemic and local infections, and antimicrobial photodynamic therapy as an alternative treatment. Secondly, four cases report of Dentistry were presented to illustrate how antimicrobial photodynamic therapy can be a safe alternative to conventional treatment **Findings:** Regarding the case reports presentation, the combination of conservative clinical approach and antimicrobial photodynamic therapy proved effective in resolving problems that could fail in the presence of antibiotic-resistant microorganisms. The cases reports were: treatment of tooth decay in patients under intensive care unit hospitalization combining dental atraumatic restorative treatment in association of antimicrobial photodynamic therapy; antimicrobial photodynamic therapy together with partial caries removal as a conservative clinical management of tooth decay; infected oral mucositis lesion treated with antimicrobial photodynamic therapy and photodynamic therapy associated with conventional endodontic treatment in patients with antibiotic-resistant microflora. Regarding systemic problems and antimicrobial photodynamic therapy, we identified three interesting works: treatment of keratoplasticum keratitis on human cornea, effect of photodynamic therapy on methicillin resistant Staphylococcus aureus and photodynamic inactivation of Paracoccidioides brasiliensis. **Conclusion & Significance:** antimicrobial photodynamic therapy is a promising alternative for the treatment of recurrent infection specially in cases were predominates resistant microorganisms. More clinical and laboratory studies is mandatory to determine the best protocols to both local and systemic infections.

Images



Recent Publications

1. Amescua G, Arboleda A, Nikpoor N, Durkee H, Relhan N, Aguilar MC, et al. Rose Bengal Photodynamic Antimicrobial Therapy. Cornea [Internet]. 2017;36(9):1141–4. Available from: http://insights.ovid.com/crossref?an=00003226-201709000-00020
2. de Araújo Neto EV, de Albuquerque Dias R. Use of the antimicrobial photodynamic therapy as a conservative clinical management of caries lesions on a permanent tooth. Photodiagnosis Photodyn Ther [Internet]. Elsevier B.V.; 2017;20(December):207–9. Available from: http://linkinghub.elsevier.com/retrieve/pii/S157210001730443X
3. dos Santos LFM, Melo NB, de Carli ML, Mendes ACSC, Bani GMAC, Verinaud LM, et al. Photodynamic inactivation of Paracoccidioides brasiliensis helps the outcome of oral paracoccidiodomycosis. Lasers Med Sci. Lasers in Medical Science; 2017;32(4):921–30.
4. Garcez AS, Nuñez SC, Hamblim MR, Suzuki H, Ribeiro MS. Photodynamic therapy associated with conventional endodontic treatment in patients with antibiotic-resistant microflora: A preliminary report. J Endod. 2010;36(9):1463–6.
5. Hoorijani MN, Rostami H, Pourhajibagher M, Chiniforush N, Heidari M, Pourakbari B, et al. The effect of antimicrobial photodynamic therapy on the expression of novel methicillin resistance markers determined using cDNA-AFLP approach in Staphylococcus aureus. Photodiagnosis Photodyn Ther. 2017;19(April):249-55
6. Pacífico Feitosa APO, Sampaio EF, de Araújo Neto EV. Atraumatic restorative treatment associated with antimicrobial photodynamic therapy applied to a patient of an intensive care unit. Photodiagnosis Photodyn Ther [Internet]. Elsevier; 2017 Aug [cited 2017 Aug 21];20(December):16–7. Available from: http://linkinghub.elsevier.com/retrieve/pii/S1572100017303113
7. Simões A, Benites BM, Benassi C, Torres-Schroter G, de Castro JR, Campos L. Antimicrobial photodynamic therapy on treatment of infected radiation-induced oral mucositis: Report of two cases. Photodiagnosis Photodyn Ther [Internet]. Elsevier; 2017;20(December):18–20. Available from: http://dx.doi.org/10.1016/j.pdpdt.2017.08.007



Biography

Eliziario Vitoriano was granted with a DDS at University of Fortaleza (2010). Has a M.Sc. in Ciències Odontològiques from Universitat de Valencia (2012) and Specializations on Oral Medicine (Universitat de València), Special Care in Dentistry (Brazilian Association of Dentistry – Ceara, Brazil) and Endodontics (Brazilian Association of Dentistry – Ceara, Brazil). Also has a Certificate Diploma of Lasers in Dentistry granted by the Special Laboratory of Lasers in Dentistry of the School of Dentistry of the University of Sao Paulo (USP). Eliziario Vitoriano has developed research on Antimicrobial Photodynamic Therapy in Endodontics, Oral Medicine and Special Care in Dentistry, focusing his work on the association between Dental Atraumatic Restorative Treatment and Antimicrobial Photodynamic Therapy in critically ill medical patients under intensive care unit and in clinical research in Endodontics.

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