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

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**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 where the main problem was centered on antibiotic resistance, systemic and local infections, and antimicrobial photodynamic therapy as an alternative treatment. Secondly, four case reports 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 keratoplasmic 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, especially in cases where predominates resistant microorganisms. More clinical and laboratory studies are mandatory to determine the best protocols for both local and systemic infections.

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