

عنوان مقاله:

Improve ICG Based Photodynamic Properties Through Conjugation of ICG Into Nano-Graphene Oxide Against Enterococcus faecalis

محل انتشار:

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خلاصه مقاله:

Background: Nowadays, a new technique such as photodynamic therapy (PDT) is used to achieve effective root canal disinfection and eliminate Enterococcus faecalis as the most prevalent species associated with secondary endodontic infections and treatment failures. Employment of an optimized nontoxic photosensitizer (PS) such as indocyanine green (ICG) is a crucial part of this technique; the current study aimed at improving ICG photodynamic properties through conjugation of ICG into nano-graphene oxide (nGO) as a new PS, to evaluate the antimicrobial effects of nGO/ICG against E. faecalis. Methods: The nGO was synthesized based on the modified Hummer method and then, direct loading of ICG onto its surface. The nGO formation was evaluated using the scanning electron microscope (SEM). The antimicrobial effect of nGO/ICG-PDT against E. faecalis was assessed by counting colony forming units (CFUs). Results and Conclusion: The SEM analysis confirmed successful synthesis of nGO. The nGO/ICG-PDT at an incorporated concentration of ۴۰۰ µg/mL ICG with irradiation at an energy density of ۳۱.۲ J/cm^۲ showed significant reduction in the number of E. faecalis higher than PDT based on ICG (۱۰۰۰ µg/mL) ($P < ۰.۰۵$). Since nGO-ICG-PDT showed a significant reduction in the count of E. faecalis at low concentration of ICG (۴۰۰ µg/mL), it could be proposed as a new approach to treat endodontic infections, alone or in combination with conventional root canal treatment.

کلمات کلیدی:

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