

## عنوان مقاله:

Antimicrobial Photodynamic Therapy Using Zinc Phthalocyanine Nanoemulsion Against Infected Wounds in Diabetic Rats

## محل انتشار:

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## خلاصه مقاله:

Background: Chronic diabetic infections commonly involve highly antibiotic-resistant pathogens, such as *Staphylococcus aureus* and streptococci. This study aimed to assess the impact of zinc (Zn) phthalocyanine incorporated into nanoemulsions on diabetic wound infections. Methods: Thirty-six adult male rats were divided into control, diabetic wound, diabetic wound infected with *S. aureus*, and three diabetic wound infected with *S. aureus* groups, which were treated with laser, medication, and a combination of medication and laser therapy. After the treatment period, wound diameter was measured, and blood samples and wound tissue were collected to evaluate antioxidant factors. Results: The results demonstrated a significant reduction in wound diameter in the group treated with both the drug and laser compared to the other groups. The activity of superoxide dismutase (SOD) and glutathione peroxidase (GPX), along with the concentration of glutathione (GSH) in the blood of all groups, exhibited a significant decrease in comparison to the control group. However, the activity of these factors in both blood and tissue showed a noteworthy increase in the rats treated with both the drug and laser, as opposed to diabetic rats infected with *S. aureus*. Conclusion: Photodynamic therapy (PDT) for infectious wounds, employing nanoemulsions containing Zn phthalocyanine, appears to enhance the body's antioxidant system by eradicating bacteria and, ultimately, expediting wound healing. This approach may be considered a potential candidate for treating antibiotic-resistant infections.

## کلمات کلیدی:

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