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588 Poster Highlight Presentation

A case of actinic keratosis treated by CO₂ ultra-pulsed laser combined with photodynamic therapy

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Objective: To observe the clinical efficacy of CO₂ super-pulsed laser combined with photodynamic therapy in the treatment of actinic keratosis (AK).

Treatment: Gauze soaked in 0.9% sodium chloride solution was applied to the scab area to soften and remove it. CO₂ super-pulsed laser was used for pretreatment. 5-aminolevulinic acid was applied to the lesion and the surrounding 1 cm of skin, and then covered in the dark for 3 hours. The LED-IB treatment instrument was used for irradiation for 20 minutes, once a week, for a total of 4 treatments.

Results: The lesions completely disappeared.

Conclusion: CO₂ super-pulsed laser combined with ALA-PDT can improve the therapeutic effect of AK patients and has good safety, which is worthy of promotion.

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589 Poster

A Case of Skin Chromoblastomycosis Caused by *Fonsecaea monophora* Treated with Itraconazole and Photodynamic Therapy

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Significance: Chromoblastomycosis, particularly caused by *Fonsecaea monophora*, presents significant clinical challenges due to its difficulty in treatment and high recurrence rates, with no established gold standard for therapy. This case report highlights a successful treatment approach that addresses this pressing issue.

Approach: We report a 65-year-old female patient with a one-year history of a skin lesion on the dorsum of her right hand, diagnosed with chromoblastomycosis through histopathological and mycological examinations. The patient was treated with oral itraconazole at a dosage of 200 mg daily, in conjunction with photodynamic therapy using 5-aminolevulinic acid photodynamic therapy (ALA-PDT), administered bi-weekly.

Results: After one month of ALA-PDT treatment, the patient showed marked improvement. Continued oral itraconazole for three months resulted in complete clinical resolution, with no recurrence observed during a one-year follow-up.

Conclusions: The combination of ALA-PDT and antifungal treatment demonstrates an effective strategy for managing skin chromoblastomycosis caused by *Fonsecaea monophora*.

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591 Poster

Clinical effects of antimicrobial photodynamic therapy to non-surgical periodontal treatment: randomized controlled, single-blind, split-mouth clinical trial

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Objective: To investigate the clinical effect of antibacterial photodynamic therapy (aPDT) combined with scaling and root planning (SRP) in the treatment of chronic periodontitis.

Approach: A randomized, controlled split-mouth design was used in this study. Sixteen patients with chronic periodontitis who met the inclusion criteria were randomly divided into experimental side and control side. The control side received conventional SRP, and the experimental side received SRP combined with aPDT treatment (SRP+aPDT).

Results: At each time point, PD, PLI, and BI were improved on the side treated with SRP+aPDT compared with conventional SRP. The improvement of BOP% and PLI in the SRP+aPDT group was significantly better than that in the conventional SRP group at 3 months after treatment ($P < 0.05$).

Conclusions: aPDT can improve gingival bleeding and control periodontal inflammation in the early stage of chronic periodontitis.

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593 Poster

Evaluation of the efficacy of photodynamic therapy combined with intravesical chemotherapy in non-muscle-invasive bladder cancer

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Eighty patients diagnosed with non-muscle invasive bladder cancer were randomly divided into two groups. Both groups underwent transurethral resection of bladder tumors under intravenous combined anesthesia. The conventional treatment group received immediate and maintenance bladder instillation chemotherapy postoperatively, while the photodynamic therapy group received photodynamic therapy at 1 and 3 months postoperatively in addition to the conventional treatment.

The tumor recurrence rate was 42.5% in the conventional treatment group and 20.0% in the photodynamic therapy group, with a statistically significant difference ($P=0.030$). The incidence of adverse reactions was 75.0% in the conventional treatment group and 80.0% in the photodynamic therapy group, mostly mild and requiring no special treatment, with no statistically significant difference between the two groups ($P=0.592$).

Photodynamic therapy combined with bladder instillation chemotherapy is safe and effective in controlling the recurrence rate after surgery for non-muscle invasive bladder cancer and is worthy of clinical promotion.

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594 Poster Highlight Presentation

Single and Consecutive Applications of Superhydrophobic aPDT over an in vivo Model of Periodontitis

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Significance: Periodontitis is an inflammatory and multifactorial disease, and has been described as one of the most common oral diseases worldwide.

Approach: Wistar rats (n=148) were subjected to the periodontitis model by the use of a cotton ligature during 7 days. The superhydrophobic (SH) device was doped with verteporfin (V) or Ce-6 (Ce) for single or consecutive (days 0, 1 and 2) applications using 60 and 125 J/cm². Mechanical debridement associated or not with chlorhexidine were used as positive and negative controls. CFU counting, clinical parameters, histological and inflammatory conditions were evaluated.

Results: Three consecutive applications of SH-aPDT decreased P. gingivalis load compared to single and the control groups (p<0.05). Clinical parameters were also improved (p<0.05). Histological and stereometric analyses showed that consecutive applications were more effective than single promoting healing and reducing inflammation.

Conclusions: SH-aPDT could be an important tool to inhibit biofilm formation while promoting healing and anti-inflammatory responses.

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596 Poster

Synergistic Photodynamic Therapy with Metalloporphyrins and Gentamicin Against MRSA

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The rise of antibiotic resistance in pathogens such as methicillin-resistant *Staphylococcus aureus* (MRSA) necessitates novel therapeutic approaches. Photodynamic antimicrobial chemotherapy (PACT), in combination with antibiotics, offers an effective alternative by generating reactive oxygen species that target microbial cells, minimizing the development of resistance. This study investigated the antibacterial efficacy of four porphyrin-based photosensitizers (P-2H, P-Zn, P-InCl, and P-GaCl) against MRSA, both independently and in synergy with gentamicin. Spectroscopic characterization and photophysical analyses were performed, followed by antimicrobial assays under light irradiation at 430 nm. PACT significantly enhanced bacterial inactivation, with P-InCl exhibiting the least ΦF (0.0002) and the $\phi\Delta$ (0.52). The combination of PACT and gentamicin demonstrated a synergistic effect, reducing bacterial viability more than individual treatments. These findings highlight the potential of metallated porphyrins in combination with antibiotics as a promising strategy to combat Methicillin-resistant *Staphylococcus aureus* (MRSA) infections, warranting further preclinical studies.

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597 oral

Effect of 5-Aminolevulinic acid photodynamic therapy combined with 30% supramolecular salicylic acid in moderate-to-severe acne vulgaris: a prospective, randomized, split-face controlled study

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Objective: The purpose of this study was to investigate the efficacy and safety of ALA-PDT combined with 30% SSA treatment on moderate to severe acne vulgaris.

Methods: A total of 19 patients with moderate-to-severe acne vulgaris were enrolled in this prospective, randomized, split-face controlled study. The patients were treated once a week for a total of two treatments and followed up until 4 weeks after the final treatment.

Results: ALA-PDT combined with 30% SSA treatment significantly reduces the number of lesions compared to PDT treatment, especially for comedones and papules without additional damage to the skin barrier. It also reduces post-treatment erythema as well as ultraviolet (UV) spots, although all patients mild pain during SSA treatment.

Conclusion: ALA-PDT combined with 30% SSA enhances the efficacy of ALA-PDT in moderate-to-severe acne vulgaris and attenuates adverse effects partially.

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599 oral

A Temporal Overview of Port-Wine Stain Research: AI-Assisted Stepwise Bibliometric and Visualization Analysis

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This study pioneers an AI-assisted stepwise bibliometric approach to analyze port-wine stain (PWS) research from 1948-2024. Focusing on photodynamic therapy, a promising PWS treatment, we identify four research phases: exploration, rapid development, multidisciplinary integration, and precision therapy. Keyword analysis reveals growing interest in photodynamic and laser therapies, particularly in the 21st century. The United States and China emerge as leading research forces, with key institutions including the University of California, Harvard University, and Shanghai Jiao Tong University. Precision medicine principles drive the current era, applying multi-omics and AI to optimize photodynamic protocols. This study provides crucial insights for advancing light-based PWS treatments, especially photodynamic therapy. However, further refinement of AI-assisted bibliometrics is needed. Global collaboration, as exemplified by American and Chinese researchers, is key to innovating PWS phototherapy.

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Impact of Blue Light on Nafcillin Resistance in *Staphylococcus aureus*: The Role of AbcA Efflux Pump

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Staphylococcus aureus, including methicillin-resistant strains (MRSA), is a major cause of microbial infections. The rise of antibiotic-resistant strains has prompted efforts to explore alternative strategies to enhance antibiotic efficacy. Antimicrobial blue light (aBL), known for its antimicrobial properties, is a promising approach, although its mechanism remains incompletely understood. This study investigated the effect of aBL on the AbcA efflux pump, which contributes to nafcillin's mild-resistance in *S. aureus*. We found that the Δ abcA strain exhibited higher sensitivity to aBL than the wild-type strain, suggesting that the presence of AbcA plays a key role in modulating aBL's antibacterial effects. In addition, WT showed higher viability reduction under co-treatment with aBL and nafcillin compared to either treatment alone, with a reduction of over 2log CFU/mL in each strain. These findings provide new insights on mechanism of aBL and its potential synergistic effect with antibiotics, offering a promising strategy to address antibiotic resistance.

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