INVESTIGACIÓN - ODONTOLOGÍA

EVALUATION OF A CLINICAL PROTOCOL FOR PHOTODYNAMIC THERAPY IN THE ENDODONTIC TREATMENT OF PRIMARY TEETH – A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

Introduction: Pulp necrosis in primary teeth, commonly caused by trauma or extensive caries, is difficult to manage due to anatomical complexity, thin dentinal walls, and frequent lack of child cooperation. Conventional endodontic treatment may not sufficiently eliminate intracanal microorganisms. Antimicrobial photodynamic therapy (aPDT), which combines a photosensitizing agent and a specific light wavelength, promotes reactive oxygen species formation, leading to effective microbial destruction without resistance, and is especially promising in pediatric dentistry due to its safety and noninvasive nature. Objective: To evaluate the efficacy and safety of a clinical aPDT protocol in the endodontic treatment of necrotic anterior primary teeth. Methodology: This randomized controlled clinical trial included 20 necrotic anterior primary teeth in children aged 2 to 5 years. Group 1 (G1) underwent conventional endodontic therapy: manual instrumentation, irrigation, and obturation. Group 2 (G2) received the same treatment plus aPDT with 0.005% methylene blue and red laser (660 nm, 100 mW, 90 s, 9 J) via optical fiber. Microbiological samples were collected using sterile absorbent paper points inserted into the canals, then cultured on blood agar under anaerobic conditions (37°C/72 h). CFUs were counted and analyzed using the Mann-Whitney test (α = 0.05). Preliminary Results: Both groups showed microbial reduction. The mean CFU reduction was higher in the aPDT group, although the difference between groups was not statistically significant (p = 0.661). No adverse events were observed, and all children tolerated the protocol well. Conclusion: This clinical aPDT protocol proved safe and well-tolerated. While no significant difference was observed in microbial reduction, results suggest potential benefits as an adjunct to conventional endodontic therapy. Continued follow-up and expanded samples are needed to confirm long-term outcomes.

Palavras-chave: keywords: antimicrobial photodynamic therapy; endodontics; primary teeth.