

PROTOCOLOS DE INVESTIGACIÓN - ODONTOLOGÍA

ANTIMICROBIAL PHOTODYNAMIC THERAPY WITH BLUE LED IN PEDIATRIC DENTISTRY: EFFICACY OF ERYTHROSINE AND GC TRIPLAQUE IN REDUCING CARIOGENIC BIOFILM IN HIGH-RISK CHILDREN AGED 3–5 YEARS

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Dental caries is among the most prevalent chronic diseases in childhood, caused by an acidogenic oral biofilm that demineralizes dental tissues. This condition poses a clinical challenge, particularly in children aged 3 to 5 years, due to behavioral limitations and high risk of progression. Minimally invasive, safe, and well-accepted strategies have been increasingly explored, such as

antimicrobial photodynamic therapy (aPDT), which combines a photosensitizing dye with a light source of compatible wavelength. This study aims to assess the efficacy of aPDT with blue LED light in reducing the microbial activity of cariogenic biofilm in high caries risk children aged 3 to 5 years. This randomized clinical trial will include three parallel groups: Group 1 (control) will undergo blue LED irradiation (VALO Grand) without dye; Group 2 will receive erythrosine + blue LED; Group 3 will receive GC TriPlaque ID Gel + blue LED. The sample will comprise 71 children (about 24 per group), determined from a sample size calculation indicating 63 participants for 80% power, increased by 12% for possible losses. Screening will follow the CAMBRA protocol adapted for children, with inclusion based on high caries risk classification. Biofilm will be collected before and after intervention using a sterile auricular curette applied to the cervical buccal surface of upper second primary molars. Samples will be placed in sterile microtubes with 1 mL Brain Heart Infusion (BHI) broth and stored at 4 °C until microbiological analysis. Colony-forming unit (CFU) counts will compare microbial load pre- and post-intervention. Results are expected to support aPDT with blue LED light as a safe, effective option for controlling caries lesions in young children, providing an additional microbiological management tool in preventive pediatric dentistry.

Palavras-chave: photodynamic therapy; dental caries; blue led; erythrosine; dental plaque.