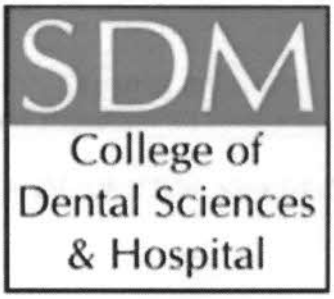
"COMPARISON OF ANTIMICROBIAL ACTIVITY OF VARIOUS DENTIN REPLACEMENT AND REPAIR CEMENTS USED FOR POSTERIOR RESTORATIONS AGAINST STREPTOCOCCUS MUTANS: AN IN-VITRO ANTIMICROBIOLOGICAL STUDY."



May 2018 Dr. SAPNA. SANTOSH . KUDTARKAR

DEPARTMENT OF PEDIATRIC AND PREVENTIVE DENTISTRY
S.D.M. COLLEGE OF DENTAL SCIENCES & HOSPITAL
DHARWAD.

ABSTRACT

BACKGROUND

Dental caries development is considered to involve a triad of indispensable factors: bacteria (dental plaque), carbohydrates (the diet), and susceptible teeth (the host) (Keyes and Jordan, 1963). Caries is the major factor that influences the longevity of dental restorations. Several species of bacteria are isolated from plaque associated with carious lesions and pulpal inflammation. *Streptococcus mutans* is one of the bacteria most frequently implicated in dental caries. These microorganisms may also be present beneath a restoration as a result of microleakage or incomplete removal of caries during tooth preparation. The ability of dental materials to inhibit recurrent caries formation is an important clinical property. Antibacterial activity, during and after setting, assumes clinical relevance because this property may help in the elimination or reduction of bacteria that have remained viable in the cavity walls or bacteria that may gain access to the cavity through microleakage channels.

Quest for newer material are never ending especially in the field of dental science. Various materials have been formulated, tested, and standardised to obtain maximum benefits for good clinical performance. Three such materials namely Type IX GIC, Zirconomer and Biodentine which are known as dentin replacement and repair materials were included in our study.

Thus aim of this investigation was to evaluate antibacterial activity of Type IX GIC, Zirconomer, Biodentine and to compare antibacterial efficacy of these materials by recording the minimal inhibitory concentration (MIC).

MATERIALS AND METHODS

Serial two fold tube dilutions method in Brain Heart Infusion (BHI) broth was carried out. Required quantity of material was dissolved in sterile BHI broth. The dilutions beginning from 256mg/ml to 0.5mg/ml was arranged in a row of test tubes for each material. Each row had two control tubes consisting of BHI broth. One of these tubes was used as a negative control to confirm sterility (without *Streptococcus mutans*) while the other served as positive control (without material) to confirm growth support. These serially diluted tubes containing materials were inoculated with strains of *Streptococcus mutans* and were placed in shaking incubator at 37^0C for 24 hrs. The lowest concentration (highest dilution) of materials preventing growth of *Streptococcus mutans* will be considered to be the minimal inhibitory concentration (MIC). Turbidity was checked to record the MIC using broth dilution method. Following this agar dilution method was carried out which gave us the evidence of inhibitory activity of each material. 100µl of the incubated broth from each tube will be placed on sterile BHI plates. These plates were incubated at 37^0C for 24 hrs and colonies formed by each material were compared.

RESULTS- Biodentine was found to be effective at a concentration of 32 mg/ml against *S.mutans* followed by Zirconomer and Type IX GIC at concentration of 64mg/dl and 128mg /dl respectively.

CONCLUSION- Biodentine shows more pronounced antimicrobial activity against *Streptococcus mutans* compared to Zirconomer and Type IX GIC.

KEYWORDS- Minimal Inhibitory Concentration, *S.mutans*, Type IX GIC, Zirconomer, Biodentine.