

EFFECTIVENESS OF CALCIUM HYDROXIDE – PROPOLIS EXTRACT COMBINATION AGAINST *LACTOBACILLUS ACIDOPHILUS* COLONIZATION

Ira Widjiastuti*, Ari Subiyanto, Edward Irwantoro, Made Ayu Ricka Dwitrayani
and Leviena Merlynike Leo

Department of Conservative Dentistry, Faculty of Dental Medicine, Airlangga University, Surabaya, Indonesia.

*e-mail : ira-w@fkg.unair.ac.id

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ABSTRACT : For several decades, the “gold standard” of direct pulp capping material is Calcium Hydroxide (CaOH). Because of its low success rate (36.70% out of 30 cases), many researchers are looking for another material derived from nature to replace CaOH. Because of its ability to act as an anti-inflammatory, anti-microbial, anti-fungal and cure scars, a material called Propolis has been used for long in dentistry. Due to this reason, addition of propolis extract to improve the function of CaOH is expected. The aim of this study is to analyze the effectiveness of CaOH-Propolis combination against *Lactobacillus Acidophilus* colonization. This research consists of 4 groups treatment of CaOH and Propolis Extract combination. Group 1 was a 1:1 combination ratio, Group 2 was a 1:1.5 combination ratio, Group 3 was a 1:2 combination ratio and group 4 was positive control group consist of combination of CaOH and Sterile Aquades. Each sample was then immersed in the saliva for 1 hour, and continued to be washed using PBS. All of the samples were then inserted into suspension of *Lactobacillus Acidophilus*, grown for 24 hours, after that the samples was taken and put into BHIB medium and vortex for 1 minute. A total of 0.1 ml of *Lactobacillus Acidophilus* Suspension of each group was put in to MHA, grown for 24 hours. The number of colonies was then calculated. The least amount of bacterial colonization was found in group 3, the group with the highest amount of Propolis Extract, continued with Group 2, Group 1, and Positive Control Group. The combination of calcium hydroxide and propolis with 1:2 ratio is the most effective on inhibit *L. acidophilus* colonization.

Key words : Calcium hydroxide, propolis, *Lactobacillus acidophilus*, pulp capping, medicine.

INTRODUCTION

Based on data of Riskesdas, 25.9% of Indonesian population has dental and oral health problem. One of the dental and oral disease that often occurs is carries (Balitbang Kemenkes, 2013). Carries is a chronic and long-lasting disease with the continuous losing of mineral ions on the enamel surface of crown or canal surface which stimulated by some of floral bacteria (McIntyre, 2005). *Lactobacillus acidophilus* is one of bacteria species that frequently found on patient's saliva with high caries (Badet and Thebaud, 2008). *L. acidophilus* can cause severe caries. These bacteria can ferment carbohydrate and produce organic acid (lactate acid), which then will change oral mouth pH to be more acid (Utami, 2017).

The infection from tooth caries that isn't treated will slowly reach the pulp and cause pulp inflammation (Lumley, 2006). One of pulp inflammation on tooth is

called reversible pulpitis. One of the treatment to treat reversible pulpitis is pulp capping (Harty, 2007). Pulp capping can be separated to direct and indirect pulp capping. Direct and indirect pulp capping is done to maintain pulp health and function, because of that the ingredient that is used in pulp capping treatment needs to be considered very cautiously to define treatment success rate. Some of the terms of using pulp capping is to control infection, prevent micro leakage and induce dentin bridge formation (Lu *et al*, 2008).

Calcium hydroxide material has been used since 1920 until now, not only as medicament and root canal sealer, but also as a pulp capping material. Calcium hydroxide can terminate microorganism because its alkaline properties and also can trigger fibroblast to accelerate healings (Prasetyo *et al*, 2020). Calcium hydroxide can be applied directly on exposed pulp, as a result there will be a necrotized layer on inflamed and surrounding pulp tissue. Dentin bridge formation will occur between