Comparison of the Effect of Calcium Hydroxide Combination with Cocoa Pod Husk Extract and Green Tea Extract On C-Fos and Dmp-1 Expression in Exposed Dental Pulp

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Abstract

Dental caries is still a worldwide problem including in Indonesia. Untreated caries may progress into deep lesion cause abnormalities in the pulp that can be reversible or irreversible. Direct pulp capping is one of the treatments of an exposed vital pulp due to caries, caries removal, and trauma. Calcium hydroxide has been the gold standard as pulp capping materials in pulp protection but it does have some disadvantages. To overcome these disadvantages the research was carried out with other alternative materials for direct pulp capping using natural material. To analyze the effect of calcium hydroxide mixed with cocoa pod husk extract and calcium hydroxide mixed with green tea extract on c-FOS and DMP-1 expression in mice perforation dental pulp.

Sixty upper molars in Wistar rats were perforated mechanically and applied the combination material of pulp capping then divided into three groups. The control group were treated with calcium hydroxide and distilled water The treatment groups were treated with calcium hydroxide with cocoa pod husk extract and calcium hydroxide mixed with green tea extract.

The treatment group of calcium hydroxide with green tea extract increased the expression of c-FOS and DMP-1 more than the treatment group of calcium hydroxide with cocoa pod husk extract, there were no statistically significant differences between groups.

Both cocoa and green tea mixed with calcium hydroxide have relatively the same anti-inflammatory and antioxidant properties so their active substances have the effect same effect to increase the number of c-FOS dan DMP- 1 expressions in mice perforation dental pulp.

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Introduction

Dental caries is still a worldwide problem including in Indonesia. Basic Health Research conducted by the Ministry of Health of the Republic of Indonesia in 2018 showed the D score of the DMFT Index for the Indonesian population is 4.4 with the average index of DMFT in permanent teeth is 7,1. The prevalence of dental caries in Indonesia is also showed a high percentage (88,8%).[1]

According to Chandra et al., (2014) stimuli on the pulp can cause changes in the pulp, both reversible and irreversible depending on the intensity, duration and severity of tissue damage and the body's defense system. Mild stimuli cause reversible inflammation (Reversible Pulpitis).[2] Indirect or direct pulp capping procedures are performed to treat reversible pulpitis to keep the pulp vital.[3]

Direct pulp capping is is a technique consist placing a biocompatible material into the pulp tissue that is accidentally exposed as a result of trauma or iatrogenic causes. The main characteristics of pulp capping materials are their biocompatibility.[4] The aim of this treatment is to stimulate the pulp tissue to form reparative dentin and keep the pulp vital.[5]

Calcium hydroxide has been the gold standard in the use of pulp capping materials. However, the use of calcium hydroxide still has physical limitations such as not adhering the material to dentin and dissolving the material in tissue fluid. According to Song et al., (2018) the

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