ABSTRACT

Introduction: Calcium hydroxide ($Ca(OH)_2$) is the material of choice for vital pulp therapies. However, $Ca(OH)_2$ has drawbacks because of the toxicity, poor sealing and tunnel defect formation tendency. Alternative materials were developed to provide a more biocompatible with better dentin formation ability agents. In this study, we evaluate the effect of (G), (CH), (TEOS) and $Ca(OH)_2$ composite, namely G/CH/TEOS/$Ca(OH)_2$ compare to $Ca(OH)_2$ on the inflammation of the dental pulp. **Materials and methods:** In this study, a total of 16 Wistar rat models of an acute pulp injury were prepared and divided into 2 group, namely treatment and control, 8 each. The treatment group were applied pulp capping material using G/CH/TEOS/$Ca(OH)_2$ and the control used $Ca(OH)_2$. On the 1st and 3rd days, rats were sacrificed. Tissue from 4 rats each group processed for histological preparation. Samples were stained using Haematoxylin-Eosin to examine neutrophils number and immunohistochemistry using anti-COX-2 antibody to identify COX-2 expression. **Results:** The results showed that neutrophils number and COX-2 expression were decreasing significantly in the treatment group compared to the control group by Kruskal Wallis and ANOVA ($p<0.05$), indicating that given G/CH/TEOS/$Ca(OH)_2$ affects the number of neutrophils and COX-2 expression. The post hoc result showed that the number of neutrophils and COX-2 expression were not significantly lower in the treatment group compared to control group each observation day by Mann-Whitney and Dunnett T-3 test. It is indicating that G/CH/TEOS/$Ca(OH)_2$ and $Ca(OH)_2$ have same effect on neutrophils number and COX-2 expression. The decrease in COX-2 expression and in neutrophils number in dental pulps after pulpotomy with G/CH/TEOS/$Ca(OH)_2$ compared to $Ca(OH)_2$ this findings suggest that the composite material provokes a lower inflammatory processes in the pulp tissue by decreasing C. **Conclusion:** Gelatin Chitosan TEOS $Ca(OH)_2$ composite have an effect on decreasing the neutrophils number and COX-2 expression in the dental pulp of Wistar rats that experience inflammation.

Keywords: $Ca(OH)_2$, Pulpotomy, Neutrophils number, COX-2 expression.