THE INCREASING OF COLLAGEN DUE TO THE INDUCTION OF THE COMBINATION OF SPIRULINA AND CHITOSAN GEL ON TOOTH EXTRACTION SOCKET (Cavia cobaya)

ABSTRACT

Background: Spirulina contains a variety of nutrition, such as C - phyocyanin, cytokines, SOD (Super Oxide Dismutase), beta carotene, vitamin B, vitamin E, zinc, protein, amino acids, and other trace elements as well as natural phytochemicals that can accelerate wound healing process on tooth extraction socket. On the other hand, chitosan contains N - acetyl - D - glucosamine which polymer structure similar to hyaluronic acid classified into glycosaminoglycan group (GAGs), which is extracellular matrix molecule that is important for wound healing. Objective: This research is aimed to study the effects of the combination of spirulina and chitosan gel applied topically on tooth extraction socket. Method: This research used 28 cavia cobayas. Those were then divided into 4 groups, namely control group, group 1, group 2, and group 3. Next, lower left incisor of those in each group was extracted. In control group, tooth extraction socket was then given 3 % CMC Na topically, meanwhile in group 1 tooth extraction socket was given 3 % CMC Na mixed with 3 % spirulina and chitosan 200 mg topically. While, in group 2, tooth extraction socket was given 3 % CMC Na mixed with 6 % spirulina and chitosan 200 mg topically, and in group 3 tooth extraction socket was given 3 % CMC Na mixed with 12 % spirulina and chitosan 200 mg (100 mg / kg) topically. After 30 days, 7 of them in each group (control and treatment groups) obtained histopathological preparations. And then, the amount of collagen was calculated. Finally, the amount of collagen was analyzed statistically by using Komolgorov - Smirnof test, one-way ANOVA test, and post hoc Tuckey HSD type test. Result: Based on the results of normality test, it is known that all data obtained were normally distributed with Sig > 0.05. Then, based on the results of one-way ANOVA test and post hoc Tuckey HSD type conducted later, it is also known that there was significant difference of the amount of collagen between the control group and those three treatment groups with Sig > 0.05. Conclusion: It may be concluded that the application of the combination of spirulina and chitosan gel topically on the third treatment group by administering 3 % CMC Na gel mixed with the combination of spirulina and 12 % chitosan 200 mg in the socket after tooth extraction can increase the amount of collagen.

Keywords: spirulina, chitosan, wound healing, collagen, tooth extraction