***In-vitro* and *In-vivo* Characteristics of EUTHYMOL[®] Mouthwash on Fluoride Retention**

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Objectives: The use of fluoride mouthwash provides both anticaries effect and refreshing feeling. Especially, the retention of fluoride in the mouth after using mouthwash is considered to be an important factor in clinical availability. The purpose of this study was to evaluate fluoride retention property of EUTHYMOL[®] mouthwash.

Methods: Pilot-scale clinical investigations were conducted in double-blind, crossover design. Participants were provided with two types of mouthwash: 1) commercial mouthwash containing sodium fluoride as a control group. 2) EUTHYMOL[®] mouthwash containing xanthan gum, cellulose gum and sodium fluoride as an experimental group. Participants rinsed with mouthwash and collected saliva at 5, 10 and 20 minutes and their salivary fluoride concentrations were measured. For *in-vitro* study, Hydroxyapatite (HAP) discs were treated by each mouthwash. They were dried, washed and sonicated with deionized water to elute residual fluoride. Then the concentration of fluoride was measured.

Results: Salivary fluoride concentrations were significantly higher in the experimental group than the control group ($p < 0.05$). The concentration of the experimental group showed 1.67- and 1.39-fold higher at 5 and 10 minutes than that of the control group, respectively. After 20 minutes, there was no significant difference between two groups due to low concentration. As a result of *in-vitro* study using HAP disc, the residual fluoride concentration on the experimental discs also showed higher than control discs but the difference was not significant.

Conclusion: The use of EUTHYMOL[®] mouthwash increased residual fluoride concentration in saliva since specially formulated gum mixtures helped to remain fluoride in saliva longer. Finally, EUTHYMOL[®] mouthwash was expected to improve availability of active ingredients and long lasting freshness.

Keywords: Fluoride retention, Saliva, HAP Disc, EUTHYMOL[®] Mouthwash, Xanthan gum, Cellulose gum