Topographic changes and microhardness of enamel after aluminum chloride and sodium fluoride topical application

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Abstract

Although declining, dental caries is still being the most prevalent disease during childhood and adolescence. Thereby, dental caries should receive significant attention in every day practice not only from the restorative procedures but also from the preventive practice designed to reduce the problem.

The use of fluoride provides the most effective method for dental caries prevention. But increasing the prevalence of dental fluorosis observed in recent years attracted the attention of many investigators to find an alternation of fluoride. Among many agents investigated, soluble salts of aluminum have been examined in a variety of dental studies. The aim of the present work was to study & compare experimentally the effect of sodium fluoride and aluminum chloride on:-

1. Enamel surface topographic changes using SEM.
2. Micro hardness of the enamel.

Forty five weaned rats were equally divided into three groups according to topical solution applied on their molar teeth either sodium fluoride (group I) , aluminum chloride (group II) or distilled water (group III). The animals were infected orally for 3 consecutive days by Streptococcus mutans. The animals were fed on caries inducing diet and the tested solutions were applied topically 3 days / week for 11 weeks. The teeth were dissected and prepared to evaluate the surface changes by SEM. Also, micro hardness of the enamel were scored and compared.

Topically applied aluminum chloride and sodium fluoride solutions significantly improved surface characteristics and increased the hardness of enamel in comparison to control group. Also, topical application of aluminum solution was found to produce more favorable results than fluoride solution. These findings strongly suggest that topical aluminum application may soon find its place in dental caries prevention field.

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