THE EFFECT ON CALCULUS DEPOSIT FORMATION OF AN AMINEFLUORIDE CONTAINING MOUTHWASH

Cheong Hoon Suh, D.D.S., M.S,D., Ph.D.
Seong Heui Son, D.D.S., M.S.D., Ph.D.

College of Dentistry, Seoul National University

Aminefluoride를 함유한 구강세척제가 치석형성에 미치는 영향에 관한 실험적 연구

서울대학교 치과대학

서 정 훈 · 손 성 희

》국문초록《

저자는 Standardized foil technque으로 Aminefluoride를 함유한 MJ—148 구강세척제를 사용하여 치석형성을 관찰한 바 다음과 같은 결과를 얻었다.

MJ—148은 대조군에 비하여 49%의 치석형성 억제 효과를 나타냈으며 이는 significant level 0.001이하이므로 치석형성 억제를 위한 구강 세척제로 사용될 수 있다.

INTRODUCTION

Dental calculus and plaque are the principal etiologic factor in dental caries, gingivitis and periodontal disease.

The plaque control is the most effective way of preventing gingival inflammation and also the most effective way of preventing calculus formation.

There is a high correlation between the presence of plaque and the prevalence and severity of gingival and periodontal disese[1,2].

There has been a constant search for chemical aids which could prevent or significantly reduce plaque and calculus formation.

Chemical preventives which would prevent plaque formation or its attachment to the tooth, destroy or remove the plaque before it calcifies; or alter the chemistry of plaque so as to prevent calcification would also significantly reduce calculus formation.

Many investigators reported that the agents capable of inhibiting the formation of plaque and / or calculus such as Ascoxal[3], Cetylpiridinium chloride[4], Sodium ricinolate[5], Chlorhexidine gluconate (2per cent)[6], Acetohydroxamic acid[7], Dextranase[8], Mucinase[9], Diphosphonate[10], a macrolide antibiotic "CC 1032"[11], and Erythromycin[12].

The purpose of present investigation was to determine the effect of Aminefluoride

contaning mouthwash on calculus deposit formation.

MATERIAL AND MEHTOD

13 dental student, average age of 23, were selected according to their ability to form dental calculus.

Based on the standardized foil technique[13,14], sandblasted Mylar foils, 0.051mm thick (Dupont type A 200), were cleaned, dried for 3 hours at 110 C, cooled in desiccators containing P_2O_5, weighed and then attached with Nylon thread (Clark's White Nylon Machine Twist S-69) to the throughly cleaned lingual surfaces of the two mandibluar incisors using procedures described previously[7].

During the 2 one-week experimental periods the subjects were asked to refrain from tooth brushing the lingual surfaces of the mandibular incisors and to use a toothpaste not containing fluoride.

During the first one-week experimental period the subjects rinsed under supervision 3 times per day for 3 minutes with 10 ml of Placebo and during the second one-week experimental period with10ml of MJ-148 mouthwash (Formula "A" (1000 ppm F^-) RCF 5600, 148, GA 297 12.38 Parts F^-, GA 335 1Part F^-).

Foils were removed after a 7 day exposure to the oral environment and the dry deposit weight on the 2 foils was determined.

RESULTS AND DISCUSSION

Rinsing with MJ-148 resulted in a highly significant ($pt<0.001$)49 per cent reduction of dry deposits formed on the Mylar foils attached to the mandibular incisors.

All subject rinsed with MJ-148 complained about the bitterness of the mouthwash and burning sensation of the oral mucous membrane during rinsing and subsequently for 2 hours.

Epidemiological studies and animal investigations have suggested that fluoride rather increases than decreases the rate of calculus formation.

The 49 per cent reduction of calculus formed on Mylar foils by rinsing with Aminefluorides (1000 ppm F^-) appears to be due to rather to the amines 297 and 335 than to the fluoride, and probably to the detergent action of the these amines. However, antibacterial and antienzymatic effects can not be ruled out.

The side effects of appearing during the rinsing period with MJ-148 very probably were not elicited by the Aminfluoride, but rather by the alcohol and aromatization of the mouthwash.

Table 1. Average weights of dry deposits formed on the foils during two-7-days experimental periods.

Treatments	Number of subjects	Number of foils	Av. Dry deposit weight (ug)	Percent reduction
Placebo	13	26	918.7	—
MJ-148(1000 ppm F^-)	13	26	468.5	49.0***

***$Pt<0.001$

REFERENCES

1) Löe, H., Theilade, E., and Jensen, S.B.: Experimental gingivitis in man. J. Periodont. 36, 177; 1965

2) Son.S., Hotz, P., and Mühlemann, H.R.: The effect of marginal gingivitis on tooth mobilitiy. Helv. odont. Acta. 15, 103; 1971.

3) Muller, E., Schroeder, H.E., and Mühlemann, H.R.: The effect of two oral antiseptics on early dental calculus formation. Helv. odont. Acta. 6, 42; 1962.

4) Sturzenberger, O.P., and Leonard, G.J.: The effect of a mouthwash as adjunct in tooth cleaning. J. Periodont-Periodontics. 40, 299, 1969.

5) Schroeder, H.E., Marthaler, T.M., and Mühlemann, H. R.: Effects of some potential inhibitors on early calculus formation. Helv. odont. Acta. 6, 6; 1962.

6) Löe, H., and Schiøtt, C. R. : The effect of mouthrinses and topical application of chlorhexidine on the development of dental plaque and gingivitis in man. J. Periodont. 5, 79; 1970

7) Son, S., and Mühlemann, H.R.: The effect on human supragingival calculus formation of acetohydroxamic acid. Helv. odont. Acta. 15, Suppl. Ⅷ, 158; 1971.

8) Lobene, R.R.: A clinical study of the effect of dextranase on human dental plaque. J. A. D.A. 82, 132; 1971.

9) Stewart, G. G.: Mucinase- A possible means of reducing calculus formation. J. Periodont. 23, 85; 1952.

10) Mühlemann, H.R., Bowles, D., Schait, A., and Bernimoulin, B.: Effect of diphosphonate on human supragingival calculus. Helv. odont. Acta. 14, 31; 1970.

11) Volpe, A.R., Kupczak, L.J., King, W.J., Kestenbaum, R. C., and Schlissel, H. J. : Antimicrobial control of bacterial plaque and calculus and the effects of these agents on oral flora.: J.D. Res. 48, 832; 1969.

12) Lobene, R. R., Brion, M., and Socransky, S.S.: Effect of erythromycin on dental plaque and plaque forming micro-organisms of man. J.Periodont-Periodontics. 40, 287; 1969.

13) Mühlemann, H.R., and Schroeder, H.E.: Dynamics of supragingival calculus formation. In:Adv. Oral Biol., Vol. 1. 1964, p. 175.

14) Schroeder, H.E.: Formation and inhibition of dental calculus. Berne, Stuttgart, Vienna, Hans Huber, Publisher, 1969.