

I.

가

1981

Hedin¹⁵⁾

가

cAMP

가

1)

가

2-3)

16)

4-5)

가

17-18)

가

가

가

19)

4)

20)

가

가

가가

가

가

T

21-22)

6-14)

Preber Bergströmdms²³⁾

가

가

가

가

가,

가

가,

가

가

Clarke²⁴⁾

가

가

가

가

Kenneyl

25)

가

가

가

가

PMNs

가

가

Bardell

Smith²⁶⁾

Bardell²⁷⁾

II.

1.

가

40

()

35

55

42.4

6

Perber Bergström Linder

28)

2.

Actinobacillus actinomycetemcomitans,
Porphyromonas gingivalis, Prevotella intermedia

40

가 5mm

가

가

Johnson

29)

(Laborlux S, Leitz, Germany)

(3) Probing pocket depth

William's probe(mm)(HU-FRIEDY, U.S.A)

1 , 2 4

2)

1)

(plaque index),

(gingival index)

(probing pocket depth)

Gracey curette(HU-FRIEDY, U.S.A.)

1% gelatine

(1) (Silness Loe, 1964)

(0.2ml)가

, William's

Vortex Mixer 30

probe(HU-FRIEDY, U.S.A)

(Laborux S, Leitz, Germany)

(× 1000).

(cocci),

(non-motile rod),

(motile rod),

(spirochete)

0: 가

1:

100

2:

가

3)

3:

가

가

(2) Gingival index(Loe Silness, 1963)

William's probe(HU-FRIEDY, U.S.A.)

III.

0:

1.

1:

- , 가

(1)

2:

- , , , ,

1 ,

2 4

(0)

3:

- , , , ,

1 Comparison of plaque indices

Group Week	Control mean ± S.D	Experiment mean ± S.D.
0	1.75 ± 0.79	1.95 ± 0.51
1	0.90 ± 0.45*	1.45 ± 0.51*
2	0.60 ± 0.60*	1.10 ± 0.64*
4	0.45 ± 0.51*	0.95 ± 0.60*

Note: *Significantly different from baseline(P<0.05)

3 Comparison of probing pocket depth(mm)

Group Week	Control mean ± S.D.	Experiment mean ± S.D.
0	5.90 ± 1.02	5.50 ± 1.10
1	5.35 ± 1.09	5.10 ± 1.12
2	4.90 ± 1.02*	5.05 ± 1.05
4	4.26 ± 1.05*	4.95 ± 1.08*

Note: *Significantly different from baseline(P<0.05)

(p<0.05).

(2)

(0)

가

(p<0.05)

2.

(1)

1 , 2 4

(0)

1 2 가

가 4

2 Comparison of gingival indices

Group Week	Control mean ± S.D.	Experiment mean ± S.D.
0	1.80 ± 0.62	1.90 ± 0.72
1	1.05 ± 0.60*	1.35 ± 0.59
2	0.70 ± 0.47*	1.10 ± 0.55*
4	0.50 ± 0.51*	0.75 ± 0.55*

Note: *Significantly different from baseline(P<0.05)

(3)

(0) 2

4

(p<0.05)

4 Proportion of cocci for each week compared with baseline(0 week) values(%)

Group Week	Control mean ± S.D	Experiment mean ± S.D
0	55.58 ± 11.94	56.32 ± 9.37
1	56.69 ± 8.81	56.05 ± 8.65
2	56.82 ± 9.52	55.02 ± 9.78
4	54.01 ± 8.05	52.69 ± 10.56

Note : *Significantly different from baseline(P<0.05)

(2)

가 (0)

1 2

4

(p<0.05).

5 Proportion of non-motile rods for each week compared with baseline(0 week) values(%)

Group Week	Control mean ± S.D.	Experiment mean ± S.D.
0	26.19 ± 7.23	23.93 ± 8.46
1	29.17 ± 7.00	25.38 ± 8.66
2	30.45 ± 7.71	28.88 ± 9.23
4	35.76 ± 6.87*	31.68 ± 8.15*

Note : *Significantly different from baseline(P<0.05)

(3)

, 2 4

6 Proportion of motile rods for each week compared with baseline(0 week) values(%)

Group Week	Control mean ± S.D.	Experiment mean ± S.D.
0	16.49 ± 9.73	18.51 ± 11.53
1	13.26 ± 10.99	17.63 ± 11.70
2	12.82 ± 11.59	15.18 ± 11.98
4	10.38 ± 10.21	13.75 ± 13.06

Note: *Significantly different from baseline(P<0.05)

(4)

(0)

7 Proportion of spirochetes for each week compared with baseline(0 week) values(%)

Group Week	Control mean ± S.D.	Experiment mean ± S.D.
0	2.47 ± 2.71	2.45 ± 2.39
1	1.69 ± 2.42	1.69 ± 1.72
2	0.95 ± 1.66	1.78 ± 2.40
4	0.59 ± 1.21*	1.36 ± 1.86

Note: *Significantly different from baseline(P<0.05)

1
가

가 2
4

1 , 2 4
4 (0)

IV.

, nitrous amine

,

1

가

30).

Arno 1958 25-55 1346

31). 21-45

728

가

가

1968 Solomon 32)

1968 20-79 9561

가

가

1978

Bastion Waite³³⁾

17-29 10

가

가

1 , 2 4 (0)

(p<0.05) (1). Pindborg ³⁴⁻⁴⁰ 가 가 가 가 가
 가가 6 7mm 가

(0) 가

(p<0.05) (2). Preber ⁴¹ 가 가 가 가
 Bergström²³ 가 51% 가 가
 25% ⁴² oxidation-reduction potential(Eh)

Clarke 가 가 1975 Kenney ⁴³ Eh values
 bleeding on probing(BOP) 가 가 Eh
 가 9 4 가 가
 BOP % 가
 가 9 2 pH가 가
 가 BOP % 가 가
 가 가 가

(0) 2 1976 Colman ⁴⁴ 4 가
 4 (p<0.05) 20 5
 (3). Nisseria
 Johnson ²⁹ (gram-negative aerobe) 가

가 가 (7).

1978 Bastion Waite 44)

7-10

가

3

가

가

가

가

가

가

1, 2

4

가

가

가

(0)

1

2

가

가 4

가가

(4).
가 가

가

가가

가

)

가

(0

1

V.

2

4

(p<0.05)(

5).

1

가

40

, 2

4

가

(6).

(0)

1

가 2

가

4

1.

1, 2, 4

4

(0)

(0)

가 가

2. 4

가

VI.

1. Tobacco and Health. A report of the surgeon general. US Department of Health, Education and Welfare. Washinton 1979.
2. Preber H, Bergstrom J: Cigarette smoking in patients referred for periodontal treatment. Scand J Dent Res; 94; 102-8 1986.
3. Francisco Rivera-Hidalgo: Smoking and periodontal disease. Accepted for publication 15 February 1986.
4. Rundgren A, Mellstrom D. The effect of tobacco smoke on the bone mineral content of the aging skeleton. Mech Aging Dev; 28: 273-277 1984.
5. Daniell WH. Osteoporosis of the slender smoker. Arch Intern Med; 136: 298 1976.
6. Raulin L, McPherson J, McQuade M, Hanson B. The effect of nicotine on the attachment of human fibroblasts to glass and human root surfaces in vitro. J Periodontol; 59: 318-325 1989.
7. Eichel B, Shahrik HA. Tobacco smoke toxicity: Loss of human oral leukocyte function and fluid cell metabolism. Science; 166: 1424 1969.
8. Kenney EB, Kaal JH, Saxe SR, et al. The effect of cigarette smoke on human oral polymorphonuclear leukocytes. J Periodont Res; 12: 227-234 1977.
9. Kraal JH, Chancellor MB, Bridges RB, et al. Variations in the gingival polymorphonuclear leukocyte migration rate induced by tobacco smoke. J Periodont Res; 12: 242-249 1977.
10. Noble RC, Penny BB. Comparion of leukocyte count and function in smoking and nonsmoking young men. Infect Immun; 12: 550-555 1975.
11. Finklfea JF, Hasselblad V, Riggan WB, et al. Cigarette smoking and hemagglutination inhibition response to influenza after natural disease and immunization. Am Rev Respir Dis; 104: 368-376 1971.
12. Bennet KB, Read PC. Salivary immunoglobulin A levels in normal subjects, tobacco smokers, and patients with minor aphthous ulceration. Oral Surg Oral Med Oral Pathol; 53: 461-465 1982.
13. Ginns LC, Goldenheim PD, Miller LG, et al. T-Lymphocyte subsets in smoking and lung cancer. Am Rev Resp Dis; 126: 265-269 1982.
14. Costabel U, Bross KJ, Reuter C, Ruhle KH, Mattyhs H. Alterations in immunoregulatory T-cell subsets in cigarette smokers: A phenotypic analysis of bronchoalveolar and blood lymphocytes. Chest; 90: 39-44 1986.

15. Hedin, C. A., Ronquist, G., and Forsberg, O.: Cyclic nucleotide content of gingival tissue of smokers and nonsmokers. *J Periodont Res* 16:337, 1981.
16. Mosely, L. H., Finseth, F. & Goody, M. Nicotine and its effect ofn wound healing. *Plastic and Reconstructive Surg.* 61. 570-575 1978.
17. Sherwin, M. A. & Gastwirth, C. M. Detrimental effects of cegarette smoking on lower extremity wound healing. *Foot Surg.* 29, 84-87 1990.
18. Siana, J. E., Rex, S. & Gottrup, F. The effect of cigarette smoking on wound healing. *Scand Plastic and Reconstructive Surgery and Hnad Surgery* 23, 207-209 1989.
19. Sweet, J. B, & Butler, D. P. Effect of smoking on the incidence of localized osteitis following mandibular third molar surgery. *Quintessence International* 2, 9-10 1978.
20. Miller, P. D. Root coverage with the free gingival graft. Factors associated with incomplete coverage. *Journal of Periodontology* 58, 674-681 1987.
21. Bergstrom J, Floderus-Myrhed B. Co-twin control study of the relationship between smoking and some periodontal disease factors. *Comm Dent Oral Epidemiol*; 11: 313-316 1983.
22. Preber H, Bergstrom J. Occurrence of gingival bleeding in smoker and nonsmoker patients. *Acta Odontol Scand*; 43:315-320 1985.
23. Preber H, Bergstrom J. Occurrence of gingival bleeding in smoking and non-smoker patients. *Acta Odontol Scand*; 43:315-320 1985.
24. Clarke, N. G., Shephard, B. C., and Hirsch, R. S. ; The effects of intraarterial epinephrine and nicotine on gingival circulation. *Oral Surg* 52: 577, 1981.
25. Kenney, E.B., Kraal, J. H., Saxe, S. R., and Jones, J.: The effect of cigarette smoke on human oral polymorphonuclear leukocytes. *J. Periodont Res* 12:227, 1977.
26. Bardell, D., and Smith, J. E.: An in vitro study of mixed population of normal oropharyngeal bacteria to cigarette smoke. *Microbios* 26:159, 1979
27. Bardell, D.: Viability of six species of normal pharyngeal bacteria after exposure to cigarette smoke in vitro. *Microbios* 32: 7, 1981.
28. Preber H, Bergstrom J and Linder LE: Occurrence of periopathogens in smoker and non-smoker patients. *J Clin Periodontol*, 19: 667-671 1992
29. Ah, MKB, Johnson GK, Kaldahl WB, Patil KD and Kalkwarf KL: The effect of smoking on the response to periodontal therapy. *J Clin Periodontol*; 21:91-97 1994
30. Clarke, N. G., Shephard, B. C. & Hirsch, R. S. The effects of intra-arterial epinephrine and nicotine on gingival circulation. *Oral Surg.* 52, 577-582 1981.
31. Arno, A., Waerhaug, J., Lovda, A., and Schei, O.: Incidence of gingivitis as related to sex, occupation, tobacco consumption, toothbrushing and age. *Oral Surg* 11:587, 1958.
32. Solomon, H. A., Priore, R. L., and Bross, I.D. J.: Cigarette smoking and

- periodontal disease. J Am Dent Assoc 77:1081, 1968.
33. Bastian, R. J., and Waite, I. M.: Effects of tobacco smoking on plaque development and gingivitis. J Periodontol 49:480, 1978.
 34. Pindborg JJ. Tobacco and gingivitis. II. Correlation between consumption of tobacco, ulcero-membranous gingivitis and calculus. J Dent Res; 28:460-3 1949
 35. Alexander AG. The relationship between tobacco smoking, calculus and plaque accumulation and gingivitis. Dent Health; 9:6-9 1970
 36. Kristoffersen T. Periodontal conditions in Norwegian soldiers. An epidemiological and experimental study. Scand T Dent Res; 78:34-53 1970
 37. Preber H, Kant T, Bergstrom J. Cigarette smoking, oral hygiene and periodontal health in Swedish army conscripts. T. Clin Periodontol; 7:106-13 1980
 38. Ismail II, Burt BA, Eklund SA. Epidemiologic patterns of smoking and periodontal disease in the United States. T. Am Dent Assoc; 106: 617-23 1983.
 39. Ainamo J. The seeming effect of tobacco consumption on the occurrence of periodontal disease and dental caries. Suom Hammaslaeak Toim; 67: 87-94 1971.
 40. Macgregor IDM. Toothbrushing efficiency in smokers and non-smokers. T. Clin Periodontol; 11:313-20 1984.
 41. Rivera-Hidalgo, F. Smoking and periodontal disease. Periodontol 57, 617-624 1986.
 42. Ismail, A. I., Burt, B. A. & Edlund, S. A. Epidemiologic patterns of smoking and periodontal disease in the United States. Am Den Assn 106:617-621 1983.
 43. Kenney, E. B., Saxe, S. R., and Bowles, R. D. The effect of cigarette smoking on anaerobiosis in the oral cavity. J Periodontol 4b: 82, 1975.
 44. Colman, G., Beighton, D., Chalk, A. J. and Wake, S. Cigarette smoking and the microbial flora of the mouth. Aust Dent J 21: 111, 1976.

Effect of Smoking on Adult Periodontitis after Non-surgical Periodontal Therapy

Young-Chae Park, Heung Sik Kim, Hyung-Keun You, Hyung-Shik Shin
Department of Periodontology, College of Dentistry, Wonkwang University

The purpose of this study was to investigate the effects of smoking on adult periodontitis after non-surgical periodontal therapy. The study population consisted of 40 patients with moderate to advanced periodontitis. Smokers(n=20) were defined as individuals smoking at least twenty cigarettes per day at the time of the initial examination. The non-smoking group(n=20) second and the fourth weeks after periodontal non-surgical therapy.

The results were as follows;

1. Clinical indices including plaque index, gingival index, and pocket depth were decreased in both smoking and non-smoking group at the first, the second, and the fourth weeks. Especially, clinical indices of non-smokers were more significantly decreased than those of smokers.
2. Non-motile rods were increased and motile rods were reduced at the fourth week. Spirochetes were reduced significantly in the non-smoking group at the fourth week.

These results suggest that smoking play a minor role in adult periodontitis after non-surgical periodontal therapy.