

# metronidazole gel

I. 10-13).  
tetracycline  
가  
metronidazole  
가  
1, 2). Löe (1965)<sup>3)</sup> Theilade (1966)<sup>4)</sup>  
가  
5, 6). 가  
5, 6, 43) 가  
14-18).  
1970 가  
가  
18-20).  
가  
가  
Goodson (1979)<sup>22)</sup> 가  
acetate 가 tetracycline cellulose  
21). metronidazole  
Newman (1984)<sup>35)</sup>  
가, metronidazole dialysis tubing

metronidazole acrylic strip , 1 scaling

. Addy (1984)<sup>23)</sup> Hitzig  
(1984)<sup>24)</sup> Archie (1994)<sup>31)</sup>

metronidazole tetracycline .

2.

(1992)<sup>25)</sup> metronidazole , Stoltze

split-mouth design

가

saline ,

chlorhexidine

Stelzel

Flores(1997)<sup>26)</sup>가

25% metronidazole gel ,

metronidazole  
25% dental gel(Elyzol , Dumex Alpha, Denmark)

0

1

, metronidazole

가

0.12% chlorhexidine

가

digluconate solution

0

1

, metronidazole gel

4

, 4

8

가

## II.

1.

1 - ,

; 2 - ;

3 -

1/4

2

가 5mm

slide-glass

0.85%

8mm

가

20

cover glass

400

6

slide

3

phenytoin,

nifedipine, cyclosporin ,

1

(1) (Plaque Index-Silness and Loe(1964)<sup>44)</sup>)

0 : 가

1 : 가

2 : 가 가

가 ,

가

3 : 가

4. : William's 14W probe( 0.5mm)

5. : William's 14W probe

6. (Listgarten & Helden (1978)<sup>5)</sup>) :

( ×400)

2-way ANOVA Test

Group , Group

(2) (Gingival Index- Loe and Silness (1963)<sup>45)</sup>)

0 :

1 : , , 가

,

2 가 5-8mm , 1/4

20

2 : , , ,

,

metronidazole gel , chlorhexidine

3 : , , ,

saline

8

(3) (Sulcular Bleeding Index - Mühlemann and Son(1971)<sup>46)</sup>)

0 :

1 : (1)

( )

2 : 4 (p < 0.05), 8

3 : , 가 ,

4 : , , 가 ,

5 : , (

1).

1 Comparison of mean plaque index between each group

week group		0	1	2	3	4	8
control	2.50 ± 0.42	1.25 ± 0.27	0.91 ± 0.28	0.79 ± 0.25	0.85 ± 0.23	0.87 ± 0.19	1.00 ± 0.17
CHX	2.70 ± 0.27	1.41 ± 0.24	1.02 ± 0.28	0.82 ± 0.28	0.78 ± 0.17	0.76 ± 0.24	0.95 ± 0.22
Elyzol	2.52 ± 0.32	1.26 ± 0.26	0.8 ± 0.25	0.61 ± 0.24	0.60 ± 0.22	0.58 ± 0.23	0.71 ± 0.21

CHX : chlorhexidine solution

Values are the mean ± S.D.

Significantly different from the baseline values at each group (P<0.05 by two-way analysis of variance).

(2) metronidazole gel, saline (p < 0.05), 8 가 ( 2).  
 , chlorhexidine, saline (p < 0.05), 4 가 ( 3).  
 가 2.89, 0.42, 2.87, 0.97, 2.76, 1.31, 4, 8, 4, 3).

2 Comparison of mean gingival index between each group

week group		0	1	2	3	4	8
control	2.52 ± 0.29	1.11 ± 0.26	0.90 ± 0.28	0.84 ± 0.30	0.82 ± 0.30	0.94 ± 0.21	1.09 ± 0.21
CHX	2.61 ± 0.24	1.36 ± 0.22	0.93 ± 0.28	0.81 ± 0.27	0.83 ± 0.29	0.79 ± 0.23	1.01 ± 0.16
Elyzol	2.41 ± 0.36	1.21 ± 0.24	0.80 ± 0.21	0.70 ± 0.28	0.75 ± 0.26	0.75 ± 0.24	0.89 ± 0.21

CHX : chlorhexidine solution

Values are the mean ± S.D.

Significantly different from the baseline values at each group (P<0.05 by two-way analysis of variance).

3 Comparison of mean sulcular bleeding index between each group

week group		0	1	2	3	4	8
control	2.76 ± 0.38	1.51 ± 0.25	0.00 ± 0.12	0.94 ± 0.24	1.12 ± 0.42	1.31 ± 0.61	1.17 ± 0.16
CHX	2.87 ± 0.45	1.41 ± 0.34	1.06 ± 0.27	0.87 ± 0.24	0.89 ± 0.24	0.97 ± 0.23	1.12 ± 0.21
Elyzol	2.89 ± 0.44	1.34 ± 0.38	0.68 ± 0.23	0.43 ± 0.21	0.40 ± 0.15	0.42 ± 0.14	0.55 ± 0.12

CHX : chlorhexidine solution

Values are the mean ± S.D.

Significantly different from the baseline values at each group (P<0.05 by two-way analysis of variance).

(4)  
 metronidazole gel 4 (p  
 가 5.96mm 4 4.37mm <0.05),  
 , chlorhexidine ( 4, 1).  
 6.07mm 4 4.67mm  
 saline 5.46mm 4.24mm (5)  
 8 0.44mm 4  
 1.37mm 가 , chlorhexidine

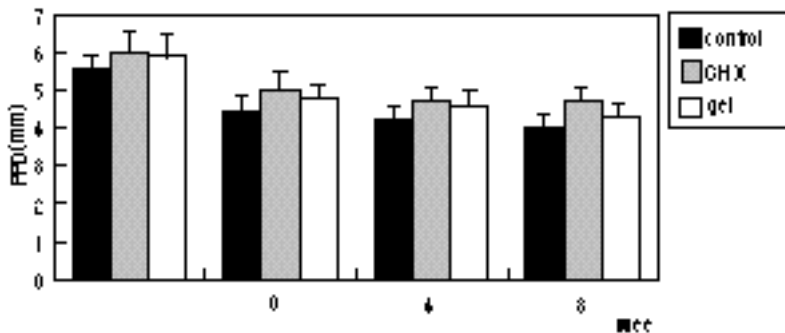
4 Comparison of mean probing pocket depth between each group

week \ group	0	4	8
control	5.46 ± 0.54	0.41 ± 0.47	4.24 ± 0.51
CHX	6.07 ± 0.83	4.97 ± 0.77	4.67 ± 0.77
Elyzol	5.96 ± 0.79	4.70 ± 0.73	4.37 ± 0.80

CHX : chlorhexidine solution

Values are the mean ± S.D.

Significantly different from the baseline values at each group (P<0.05 by two-way analysis of variance).



1 Schematic diagram of mean probing pocket depth between each group

5 Comparison of mean gingival recession values between each group

week \ group	0	1	2	3	4	8	
control	0.57 ± 0.67	1.31 ± 0.62	1.29 ± 0.56	1.29 ± 0.56	1.33 ± 0.52	1.36 ± 0.56	1.46 ± 0.55
CHX	0.31 ± 0.42	1.11 ± 0.30	1.12 ± 0.31	1.12 ± 0.31	1.12 ± 0.31	1.17 ± 0.34	1.37 ± 0.37
Elyzol	0.44 ± 0.54	1.26 ± 0.41	1.31 ± 0.40	1.31 ± 0.40	1.35 ± 0.38	1.37 ± 0.37	1.55 ± 0.40

CHX : chlorhexidine solution

Values are the mean ± S.D.

Significantly different from the baseline values at each group (P<0.05 by two-way analysis of variance).

6 Comparison of mean distribution of cocci+rods, spirochetes and motile rods between each group

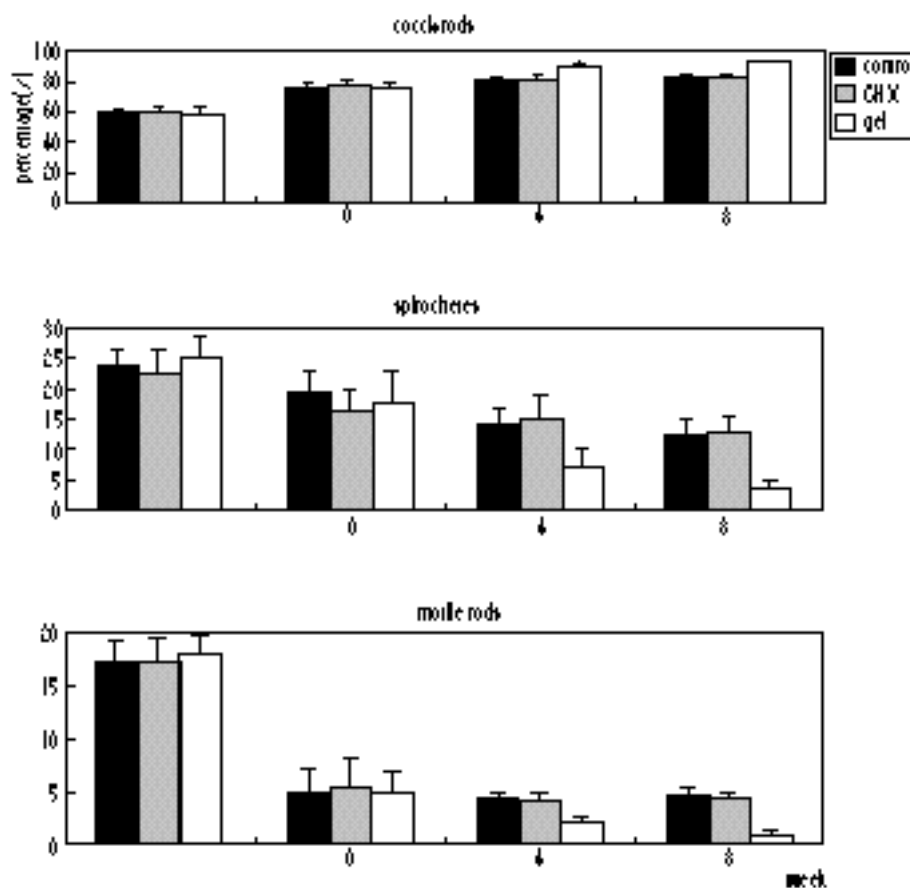
organisms	cocci+rods			spirochetes			motile rods		
group week	control	CHX	Elyzol	control	CHX	Elyzol	control	CHX	Elyzol
	58.88 ± 3.92	59.24 ± 4.89	57.31 ± 4.91	23.91 ± 3.09	22.82 ± 4.14	24.94 ± 3.62	17.21 ± 1.94	17.24 ± 2.35	17.75 ± 1.87
0	75.27 ± 4.03	77.22 ± 5.26	76.22 ± 3.50	19.18 ± 3.73	16.67 ± 3.79	18.53 ± 3.76	5.55 ± 1.38	6.12 ± 2.13	5.24 ± 1.19
4	81.86 ± 3.33	81.83 ± 5.27	90.39 ± 2.39*	13.69 ± 2.89	14.18 ± 4.29	7.31 ± 2.26*	4.45 ± 0.71	3.99 ± 1.00	2.29 ± 0.42*
8	82.92 ± 2.15	82.87 ± 2.52	94.70 ± 1.10*	12.58 ± 2.03	12.85 ± 2.13	4.03 ± 0.93*	4.50 ± 1.01	4.28 ± 0.67	1.27 ± 0.33*

CHX : chlorhexidine solution

Values are the mean ± S.D.

Significantly different at each interval (P<0.05 by two-way analysis of variance).

\* Significantly different from the control group (P<0.05 by two-way analysis of variance).



2 Schematic illustration of % variation of cocci+rods, spirochetes and motile rods between each group at the various time intervals

0.31mm 1.71mm , saline  
 0.57mm 1.36mm 가  
 (p < 0.05). 가 8

가 , ,

가

( 5).

2.

8  
 ,  
 가  
 4  
 (p < 0.05), ( 6, 2).

carrier  
 carrier  
 carrier  
 carrier  
 metronidazole tetracycline  
 25)  
 1 가 gel

IV.

Stenberghe (1993)<sup>28)</sup> Porphyromonas  
 gingivalis, Prevotella intermedia, Actinobacillus  
 actinomycetemcomitans  
 , Magnusson (1984)<sup>7)</sup>

가

가 2-4 가 가  
 . Listgarten Helden (1978)<sup>9)</sup>

27).

가

가

2 25%가 17 18%가 23  
 가 5 6%가 17 19%,  
 metronidazole gel 8

4%, 1% , 가

metronidazole gel 8

chlorhexidine saline 41), , metronidazole

amoxicillin

. Loesche (1981)<sup>32)</sup> 1

metronidazole

가 , Linde (1982, 1983)<sup>33, 42)</sup>

tetracycline, metronidazole 10-13), metronidazole

Goodson (1994)<sup>13)</sup> tetracycline

5-14 $\mu$ g/M $\ell$  , 가

tetracycline fiber

가 3 가 가

Joyston (1984)<sup>34)</sup> Newman

(1984)<sup>35)</sup> metronidazole 가

Somerman

(1988)<sup>29)</sup> minocycline tetracycline 가

minocycline

가

Gusberti (1988)<sup>36)</sup> Jenkins (1989)<sup>37)</sup>

Ciancio (1980)<sup>14)</sup> minocycline , Söder (1990)<sup>38)</sup>

가

5 metronidazole 가

van Steenberghe (1993)<sup>28)</sup> 가

minocycline gel , metronidazole

가

Goodson (1985)<sup>30)</sup> minocycline strip 27),

8 553 $\mu$ g/M $\ell$  , metronidazole

. minocycline , metronidazole

1 $\mu$ g/M $\ell$  95% Stoltze (1992) metronidazole gel

가 0.3 $\mu$ g/M $\ell$  ,

minocycline strip gel 25),

metronidazole gel 39),

, metronidazole tetracycline metronidazole

가



24).

가

strip

carrier

metronidazole gel

, metronidazole gel

gel

metronidazole gel

metronidazole gel

가

saline

chlorhexidine

가

metronidazole gel

metronidazole gel

metronidazole gel

V.

Stoltze

가 5-8mm

가

metronidazole

가

1/4

2

20

가

metronidazole gel

가

가

가

metronidazole gel

4

8

metronidazole gel

가

가

saline

chlorhexidine

. 0, 4, 8

가

1. metronidazole gel

가

가

<sup>40)</sup>,

(p<0.05),

metronidazole gel

7

가

( $p < 0.05$ ),  
 가 .  
 2. metronidazole gel  
 8  
 가 metronidazole gel .  
 3. metronidazole gel  
 chlorhexidine  
 가  
 ( $P < 0.05$ ),  
 ( $p < 0.05$ ).  
 가  
 ( $p < 0.05$ ).  
 4. metronidazole gel  
 chlorhexidine  
 metronidazole  
 gel  
 chlorhexidine  
 ( $p < 0.05$ ).  
 metronidazole gel  
 가  
 가

## VI.

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## Effects of metronidazole gel as an adjunct to scaling and root planing on the treatment of adult periodontitis

Sang-Cheol Lim, D.M.D., M.S.D.

Department of periodontology, College of Dentistry, Kyung-Hee University

The purpose of this study was to evaluate the clinical and microbiological effects of metronidazole 25% dental gel that was applied to periodontal pockets who have moderate to advanced chronic adult periodontitis were selected for this study. The quadrants that had 2 or 3 teeth with 5-8mm probing pocket depth were selected and divided into test side and control side according to the split-mouth design. The metronidazole 25% dental gel applied on test side and 0.12% chlorhexidine solution applied on positive control side, normal saline irrigation into periodontal pocket was applied to negative control side respectively. Above procedures followed scaling and root planing at baseline(0week).

The subgingival sterile saline irrigation and chlorhexidine irrigation were done for about 30 seconds respectively. The metronidazole 25% dental gel was applied to periodontal pocket at 0,1 week in the test side.

The clinical and microbiological analysis carried out at baseline(0week) and 4,8 weeks.

The results of this study were as follows;

1. The sulcular bleeding index, probing pocket depth were significantly reduced in the test group. The relative proportions of spirochetes and motile rods were significantly reduced to negative control group and the proportion of cocci was correspondingly increased in the test group.
2. The sulcular bleeding index, probing pocket depth were significantly reduced in metronidazole group. and, there was a significant differences between 2 groups. Also, the relative proportions of spirochetes and motile rods were reduced in both group. And, there was a significant differences between 2 groups.

In conclusion, application of metronidazole 25% dental gel as an adjunct to mechanical debridement of root surfaces may improved the clinical and microbiological status of periodontal disease sites.