

가

3

.

I.

3

, ,

가

가

Goodson ⁵⁾ tetracycline
cellulose acetate hollow fiber

. 1992 Deffez ¹⁾

roxithromycin ery -

thromycin

, 1995

Sasaki ²⁾

azithromycin

¹¹⁾가

가

(carrier)

6 -

가

fiber, gel, chip

(,)

. 1975 Bain ³⁾

25%

damycin

clin -

tis가

coli -

, , 1985

Sasaki ⁴⁾

lenampicillin

polyester

¹²⁾

Minocycline

gastro - intestinal disorders, diarrhea

tetracycline

* 1999 (06 - 99 - 007) ()

가 (5.7mg/) 1
 , 1.4mg ,
 ()
 .¹³⁾
 . 1990 ¹⁴⁾ in vitro 2.
 1992 ¹⁵⁾ in vivo 30% . 1)
 minocycline 가
 7 18 - 65 , 2)
 , ¹⁵⁾ 가
 . ¹⁶⁾ , 3) 가 2
 , 4)
 , 가 , 5) 가 ,
 가 ,
 가 ,
 17), 18), 19), 20 - 21), . 1) 가 ,
 22), 2) 30 ,
 , 3)
 가 ,
 , ²³⁾ , 4) , 5)
 , 가 ,
 24) , 6)
 가 32 , 32
 가
 .
 ,
 ,
 ,
 .

(Institutional Review Board of Seoul
 National Dental Hospital)

가 .
 II.
 3. ,
 1.

가 , 2: , 3: “

(Gingival Crevicular Fluid)

periopaper strip(ProFlow Inc., New York, U.S.A.)

2 4

가

30 Periotron 8000(ProFlow Inc., New York, U.S.A.)

Gracey curette

4.

, 0.2ml 가 vortex 10

0.9%

. 23gauge

slide 400

1

1

가

(,)

가

, #35 paper point 3

, 30

5.

2ml VMGA vortex

80% N₂, 10% CO₂, 10% H₂가

가

(Gingi - val Index), (Papillary Bleeding Index),

10 3

Index),

1

, 1

(1)

BPB

100μl

5% 가 , Hemin, blood agar plate

L e Sil -

37 10 -

ness²⁵) Gingival Index M hlemann²⁶) Papillary Bleeding Index(PBI)

14

BPB

3

“ 0: , 1: (2)

100µl 5% sheep blood가 paired t - test
 blood agar plate 10% CO₂ Wilcoxon;s singed rank test
 incubator 37 3 8.0(SPSS, U.S.A.) SPSS

6.

III.

t - test 1
 ,
 test
 chi - square test
 ,
 chi - square
 가
 Fisher's exact test
 ,
 74
 6

Table 1. Mean age of patients in each group.

	Mean Age	p - value(t - test)
Control group	25.03 ± 2.90*	0.695
Experimental group	25.41 ± 4.54	

*Mean ± S.D.

Table 2. Sexual distribution of each group.

	Sexuality		Total
	Male	Female	
Control group	20	12	32
Experimental group	22	10	32
Total	42	22	64
p value of chi - square test			0.793

Table 3. Comparison of Gingival Index, Papillary Bleeding Index, and Gingival Crevicular Fluid of before treatment in each group

	GI of Baseline	PBI of Baseline	GCF of Baseline
Control group	2.03 ± 0.177*	1.69 ± 0.54	114.59 ± 18.49
Experimental group	2.06 ± 0.246	1.81 ± 0.47	116.25 ± 18.40

*Mean ± S.D.

There was no significant differences between GI of Baseline and that of 1 Week(p=0.56).

There was no significant differences between PBI of Baseline and that of 1 Week(p=0.33).

There was no significant differences between GCF of Baseline and that of 1 Week(p=0.72).

Table 4. Comparison of percentage of bacteria before treatment through phase contrast microscope in each group

	Cocci of baseline	non - Motile rod of baseline	Motile rod of baseline	Spirochete of baseline
Control group	61.85 ± 18.53*	19.47 ± 12.46	14.20 ± 10.93	4.50 ± 6.14
Experimental group	57.98 ± 12.92	20.86 ± 12.35	14.81 ± 9.93	6.35 ± 7.99

*Mean ± S.D.

There was no significant difference between the two groups in percentage of cocci at baseline(p=0.32).

There was no significant difference between the two groups in percentage of non - motile rods at

Table 5. Comparison of numbers of colony forming unit of aerobic bacteria, anaerobic bacteria, and BPB(log₁₀ value of numbers of cfu) in each group at baseline.

	Aerobes	Anaerobes	Black Pigmented Bacteria
Control group	7.51 ± 0.43*	7.54 ± 0.33	6.35 ± 0.59
Experimental group	7.58 ± 0.29	7.55 ± 0.35	6.20 ± 0.44

*Mean ± S.D.

There was no significant differences between two groups in log₁₀ value of Aerobes at baseline(p=0.17).

There was no significant differences between two groups in log₁₀ value of Anaerobes at baseline(p=0.32).

There was no significant differences between two groups in log₁₀ value of BPB at baseline(p=0.40).

Table 6. Improvement of GI index after treatment

	Improvement of GI		Total
	No	Yes	
Control group	18	14	32
Experimental group	4	27	32
Total	23	41	64
p value of chi - square test(Fisher's Exact test)			0.000

Experimental group showed significant improvement in GI compared with that of the control group(p<0.01).

Table 7. Average score of Gingival Index and Papillary Bleeding Index

	Gingival Index		Papillary Bleeding Index	
	baseline	after 1 week	baseline	after 1 week
Control group	2.03 ± 0.18*	1.59 ± 0.56	1.69 ± 0.54	1.44 ± 0.72
Experimental group	2.06 ± 0.25	0.69 ± 0.69	1.81 ± 0.47	0.66 ± 0.7

*: Mean ± S.D.

68

4

64

가 . 64 (Gingival Index, GI)
 가 () 32 , 1
 () 32 가
 25.2 (: 3.8) . 42
 , 22 . 14 , 32
 27 (Table
 6).
 1. Chi - square test(Fisher's Exact test)

Gingival Index, Papillary
 Bleeding Index, Gingival Crevicular Fluid, 가 (p<0.001).

t - test Table 7
 chi - square test .
 3. (Papillary Bleeding
 Index, PBI)
 (Table 1, 2, 3, 4, and 5).

2. (Gingival Index, GI)
 가 8 , 32 26
 1 가

Table 8. Improvement of Papillary Bleeding Index after treatment

	Improvement of PBI		Total
	No	Yes	
Control group	24	8	32
Experimental group	6	26	32
Total	30	34	64
p value of chi - square test			0.000

Experimental group showed significant improvement compared with control group(p<0.01).

Table 9. Amount of Gingival Crevicular Fluid

	Baseline	After 1 week
Control group	114.6 ± 18.5*	111.0 ± 20.0
Experimental group	116.3 ± 18.4	80.5 ± 18.3# §

*Mean ± S.D.

#: Significantly lower than baseline(p<0.01).

§ Significantly lower than control group in each period(p<0.01).

(Table 8).

5. (Gingival Crevicular Fluid)

Chi - square test

($p < 0.001$).

가

Periotron 8000

()

가 (: 114.6 ± 18.5 ,
: 116.3 ± 18.4 , $p = 0.72$).

4.

()

32 2

(paired t - test)

1

, 1

($p = 0.13$).

)

32 4

($p < 0.01$).

4

가

1

(t - test)

($p < 0.01$) (Table 9).

Table 10. Bacteria distribution in phase contrast microscope examination

		Cocci	Non - Motile rod	Motile rod	Spirochetes	Total
Control group	Baseline	$61.9 \pm 18.5^*$	19.5 ± 12.5	14.2 ± 10.9	4.5 ± 6.1	100
	After 1 wk	61.1 ± 17.0	22.9 ± 11.3	12.8 ± 11.0	3.1 ± 8.2	99.9
Experimental group	Baseline		58.0 ± 12.9	20.9 ± 12.4	14.8 ± 9.9	6.4 ± 8.0
	After 1 wk		26.5 ± 13.7	9.8 ± 9.9	3.0 ± 6.2	100.1

Table 11. Numbers of colony forming unit of aerobic bacteria, anaerobic bacteria, and BPB(log10 value of numbers of cfu)

		Aerobic Bacteria	Anaerobic Bacteria	Black Pigmented Bacteria
Control group	baseline	$7.51 \pm 0.43^*$	7.54 ± 0.33	6.35 ± 0.59
	after 1 wk	7.42 ± 0.58	7.41 ± 0.35	6.07 ± 0.63
Experimental group	baseline	7.60 ± 0.29	7.55 ± 0.35	6.20 ± 0.44
	after 1 wk	$7.38 \pm 0.36\$$	$6.30 \pm 0.52\$$	$5.86 \pm 0.44\#$

*; Mean \pm S.D. n=32(aerobic, anaerobic bacteria).

6.

(Black Pigmented Bacteria, BPB)

(cocci), 가 , BPB
(non - motile rod), (Wilcoxon's signed rank test)
(motile rod), (spirochetes), , , p=0.01

Table

10

(p<0.01)

가

가

IV.

가

가

7.

(Minocycline)

(bacteriostatic)

(colony) , log₁₀

paired t - test

(Table 11), p=0.001

가

. Gordon ²⁷⁾

bacteria)

(Aerobic 2 10
(Anaerobic bacteria) 6

cline

250mg tetracy -

48

(p<0.001)

4 - 8ug/ml

. Ciancio ²⁸⁾

5 (microflora)
 150mg
 8 48
 6.6 15.9ug/ml 가
 8

Baker ²⁹⁾
 17가
 가 substantivity . Table
 가 가 1, 2, 3, 4, 5
 , P. gingivalis,
 P. intermedia, F. nucleatum, A. actino -
 mycetemcomitans, Capnocytophaga 가
 가 collagenase 가
 가
 Chi - square test()
 .(Table 6, 7 8)

(broad - spectrum) 가
 . 1993 Rajasuo ³⁰⁾
 3 가
 (periodontopathic bac - 1 , 1
 teria) 2 3
 pericoronal space
 . , 2
 3 Motile rod
 가 Spirochetes
 . 1991 Wade³¹⁾ Motile rod Spirochetes
 Preotella intermedia, Peptostreptococcus 가
 micros, Veillonella species, Fusobacterium
 nucleatum , Streptococcus mitis cfu log
 , Anaerobic
 Bacteria Aerobic Bacteria
 1993 Leung ³²⁾ 3 . Anaerobic Bacteria
 , Aerobic Bacteria ,

Rebound
pigmented bacteria(BPB)
가 ,

. Black

V.

BPB

가

3

(GI, PBI)

()

1.

(Kendall's tau b correlation analysis),

가

GI

($p < 0.01$)

(0.553)

. PBI

2.

PBI

($p < 0.01$)

3.

가

4.

3

가

가

5.

24)

()

6.

가

74

가

68

VI.

가

가 7

4

가

, 4

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- Abstract -

Effects and Safety of Minocycline Loaded Polycaprolactone for Peri - coronitis

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This clinical study was designed to determine the clinical and microbiological outcomes and safety of using minocycline loaded polycaprolactone strip for pericoronitis patients. 64 patients showing symptoms and signs of pericoronitis were enrolled according to the inclusion criteria in this double blind study. They were randomly assigned to two groups. 32 patients comprised control group and they received only polycaprolactone films in pericoronal spaces, and another 32 patients comprised experimental group and they received polycaprolactone films loaded with 30% minocycline. Informed consent was obtained from all the participants before beginning the study. At the initial visit, gingival index(GI), papillary bleeding index(PBI), amount of gingival crevicular fluid(GCF) were recorded, and microbio -

logical sampling was done. Then, loaded or unloaded polycaprolactone film was inserted into the pericoronal spaces. No drug was prescribed excepting this film. After one week, clinical and microbiological exam was repeated. Presence of any side effects or inconveniences were checked. Chi - square test and t - test was performed to compare outcomes. At baseline, there were no significant differences in all the criteria between experimental group and control group. Experimental group showed significant improvement compared with control group both in GI($p<0.01$) and PBI($p<0.01$). The amount of GCF of the experimental group was significantly decreased compared with the control group($p<0.01$) and baseline($p<0.01$). In microbiological study, percentage of motile rod was prominently decreased in the experimental group. Also, aerobic($p<0.001$), anaerobic($p<0.001$) and black pigmented($p<0.01$) bacteria were significantly decreased from the baseline. Furthermore, no side effects or inconveniences was reported in the experimental group. From this study, it was concluded that insertion of polycaprolactone film with 30% minocycline into the pericoronal spaces would be effective and safe treatment for pericoronitis.