

Controls periodontitis

Periodontitis



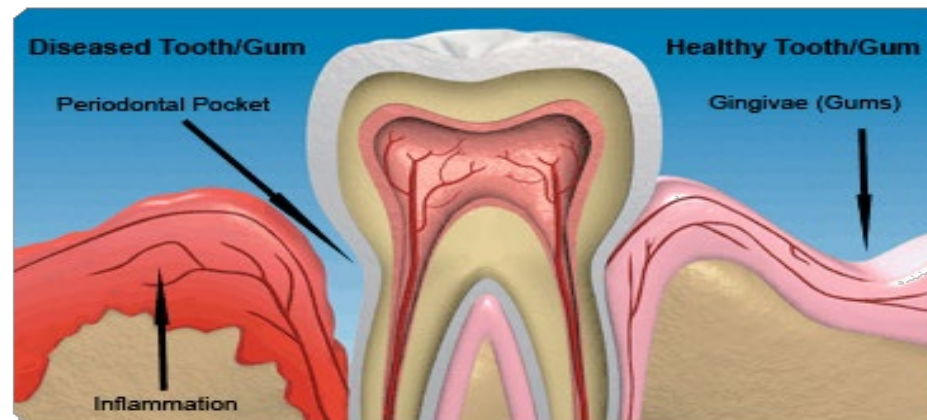
Healthy gums
and teeth



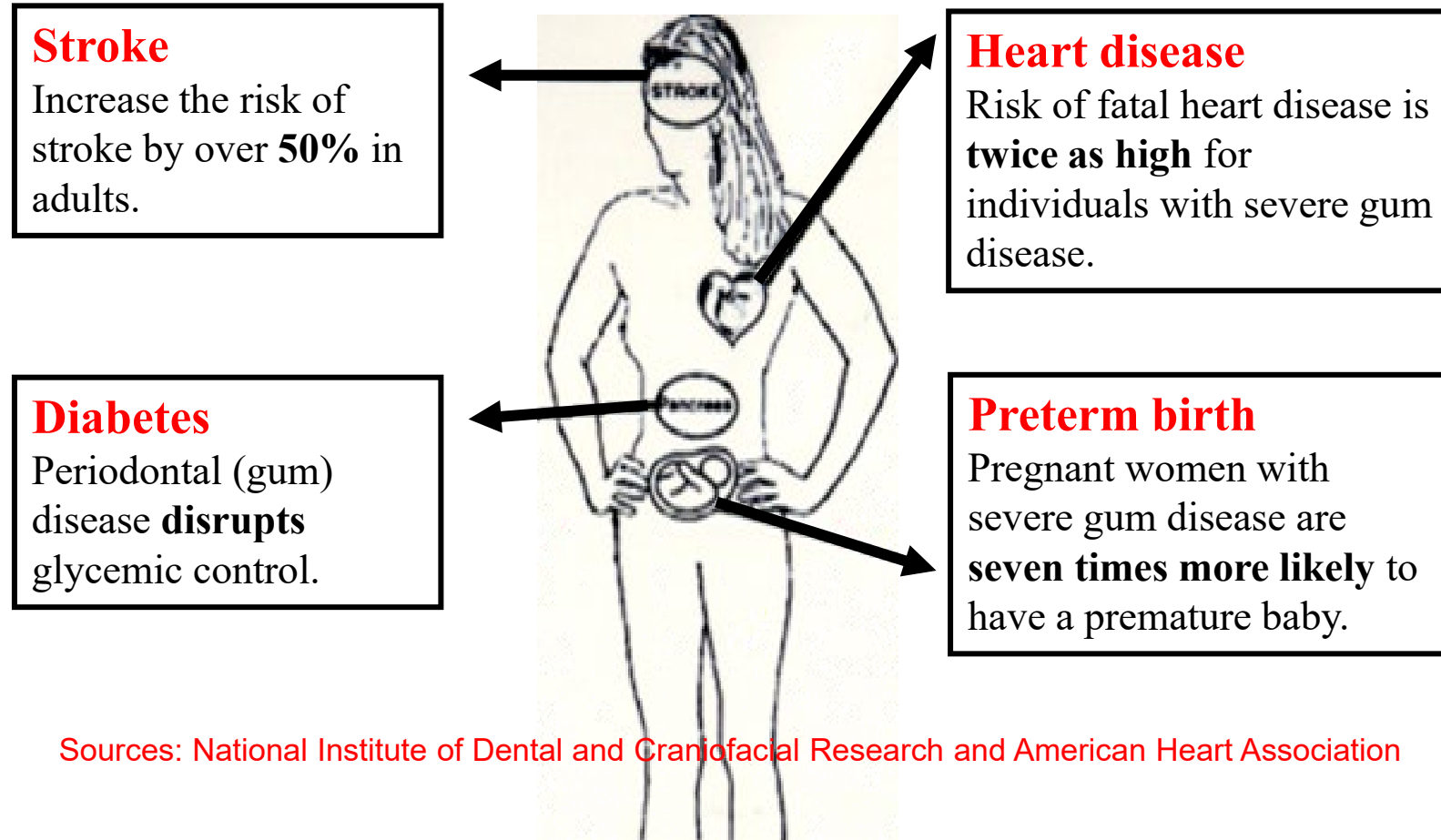
Moderate
periodontitis



Advanced
periodontitis



Periodontitis is associated with systemic diseases

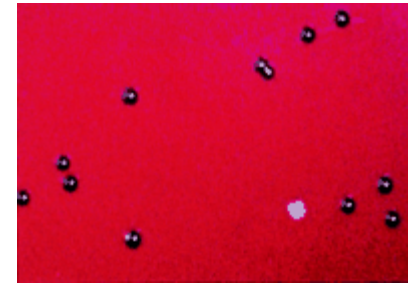


Sources: National Institute of Dental and Craniofacial Research and American Heart Association

Major Responsible Bacteria

Porphyromonas gingivalis

- Gram negative
- Anaerobic
- Black shiny and smooth colony on blood agar



Gingipain is the main pathogenic factor of *P. gingivalis*

Functions of Gingipain

- Causes damages to various tissues and systems (intercellular proteins, immune cells & cytokines, fibrin & fibrinogen, vv).
- Helps *P. gingivalis* invade into host cells (cell invasion).
- Helps *P. gingivalis* to agglutinate with other bacteria forming biofilm.
- Absorbs into blood causing systemic effects (heart diseases, early birth, etc)

Specific IgY (PG) contains specific
IgY against gingipain of *P. gingivalis*

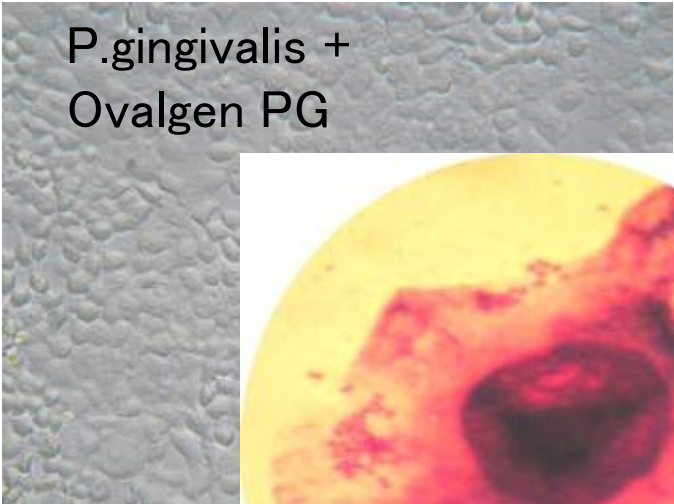
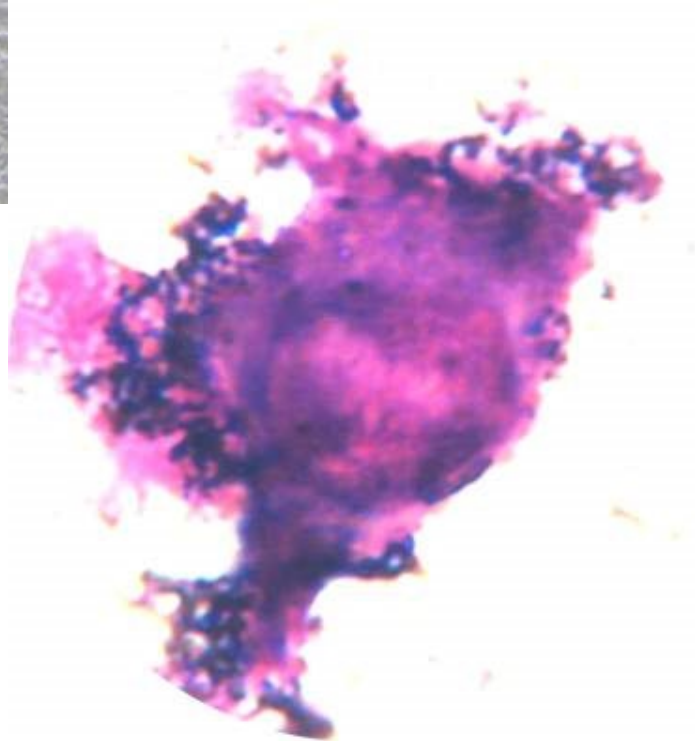
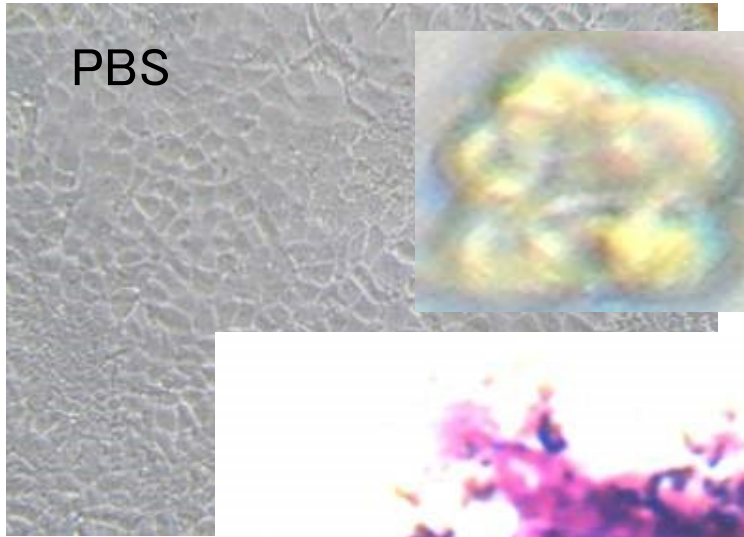
In-vitro test 1

**In-vitro inhibitory effects of Specific IgY (PG)
on *Porphyromonas gingivalis***

In-vitro inhibitory effects of Specific IgY (PG) on *Porphyromonas gingivalis*

- Materials:**
- Human gingival epithelial cells (KB cell line)
 - *P.gingivalis* strain ATCC 33277
 - Anti-*P.gingivalis* IgY and non-immunized IgY

- Protocol:**
- Grow KB cells in a 24-well plate until a confluent monolayer is formed.
 - Mix *P.gingivalis* with IgY samples, incubate at 37 C 1 h, add to the cells, incubate 2 h at 37 C.
 - Wash to remove dead cells, count the number of alive cells.



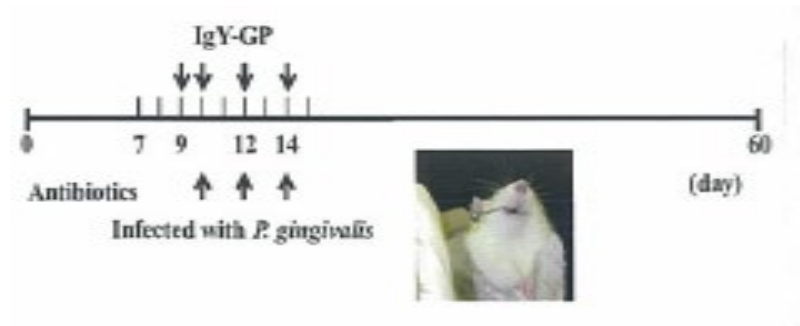
Results: Cell damage inhibition

Sample	total No. of Cells	Protection after	
		<u><i>P.gingivalis</i></u> treatment: alive cells	(%)
PG only	15.8	2.2	14
PG + Control IgY	14.8	4.1	28
PG + Specific IgY (PG)	15.9	13.7	86

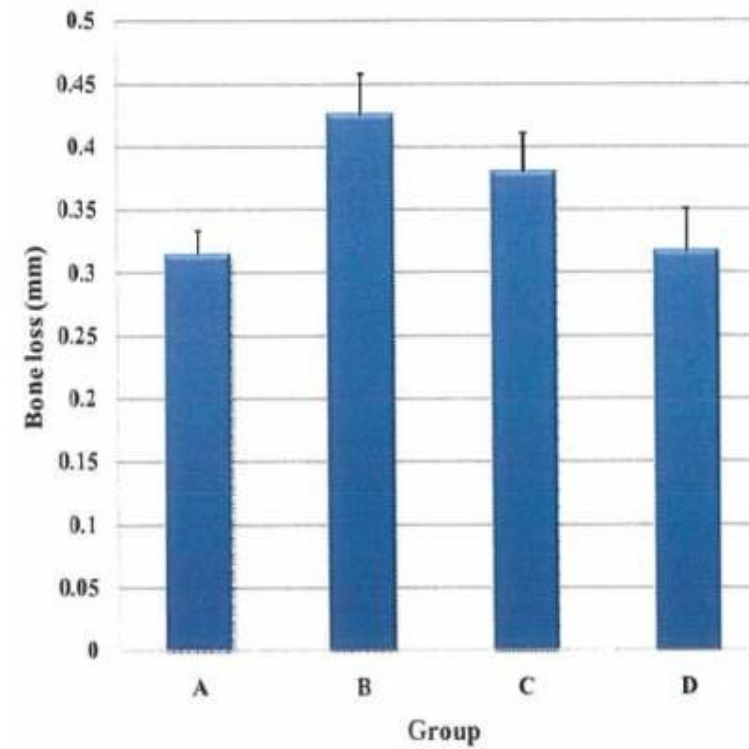
(number of alive cells x 10⁴)

Trial on Sprague-Dawley rats

(by Prof. Hamada, Kanagawa Dental College)



Measurement of bone loss in an upper jaw.

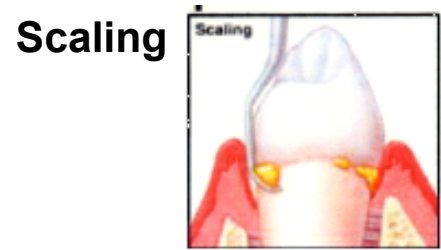


- A: non-infected control
- B: infected, non-treated
- C: infected, treated with cont IgY
- D: infected, treated with IgY-PG



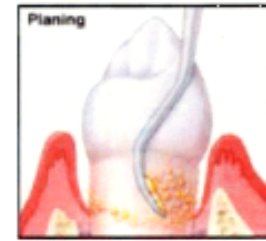
- **Test sample:**
 - Neutral gel containing 20mg Specific IgY (PG) /syringe
- **Subject:** 5 periodontitis patients
- **Administration:** One dose of gel applied into pockets after scaling and root planing (SRP). Control pockets only treated by scaling and SRP.
- **Examination parameters:** (check before and 4 weeks after)
 - (1) Oral examination: Probing depth (PD), Bleeding on probing (BOP).
 - (2) Bacteria: number of *P. gingivalis* and total bacteria in periodontal pockets (by real-time PCR).

Control teeth (Right half of mouth)

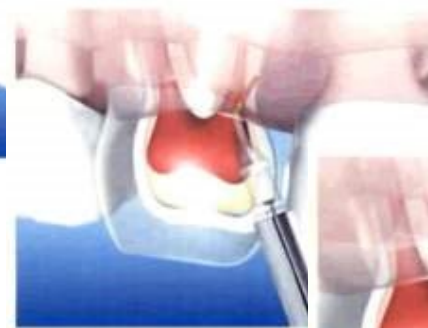
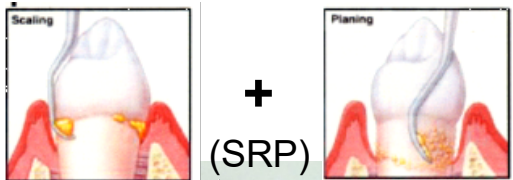


Root Planing (SRP Only)

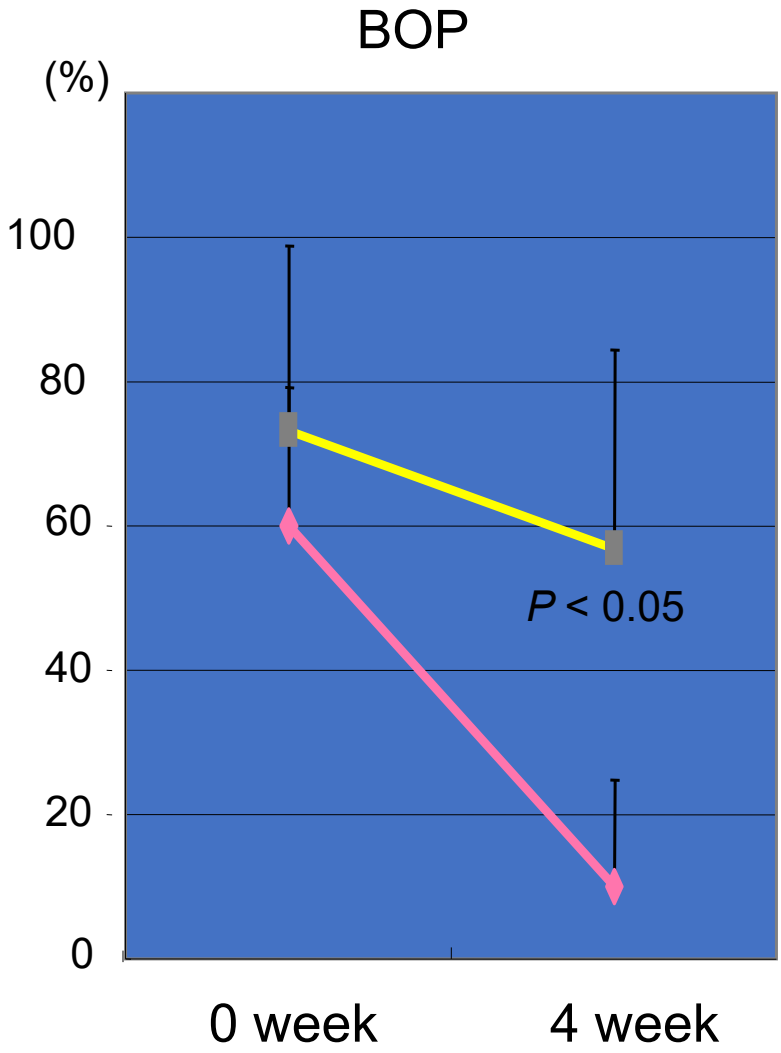
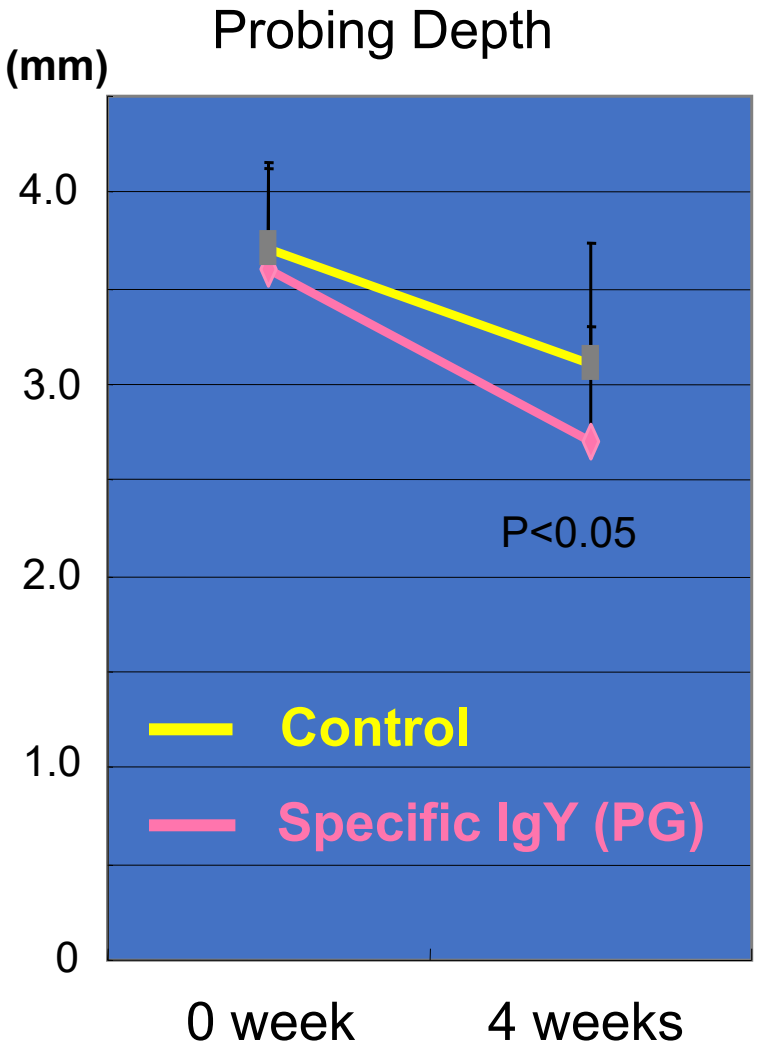
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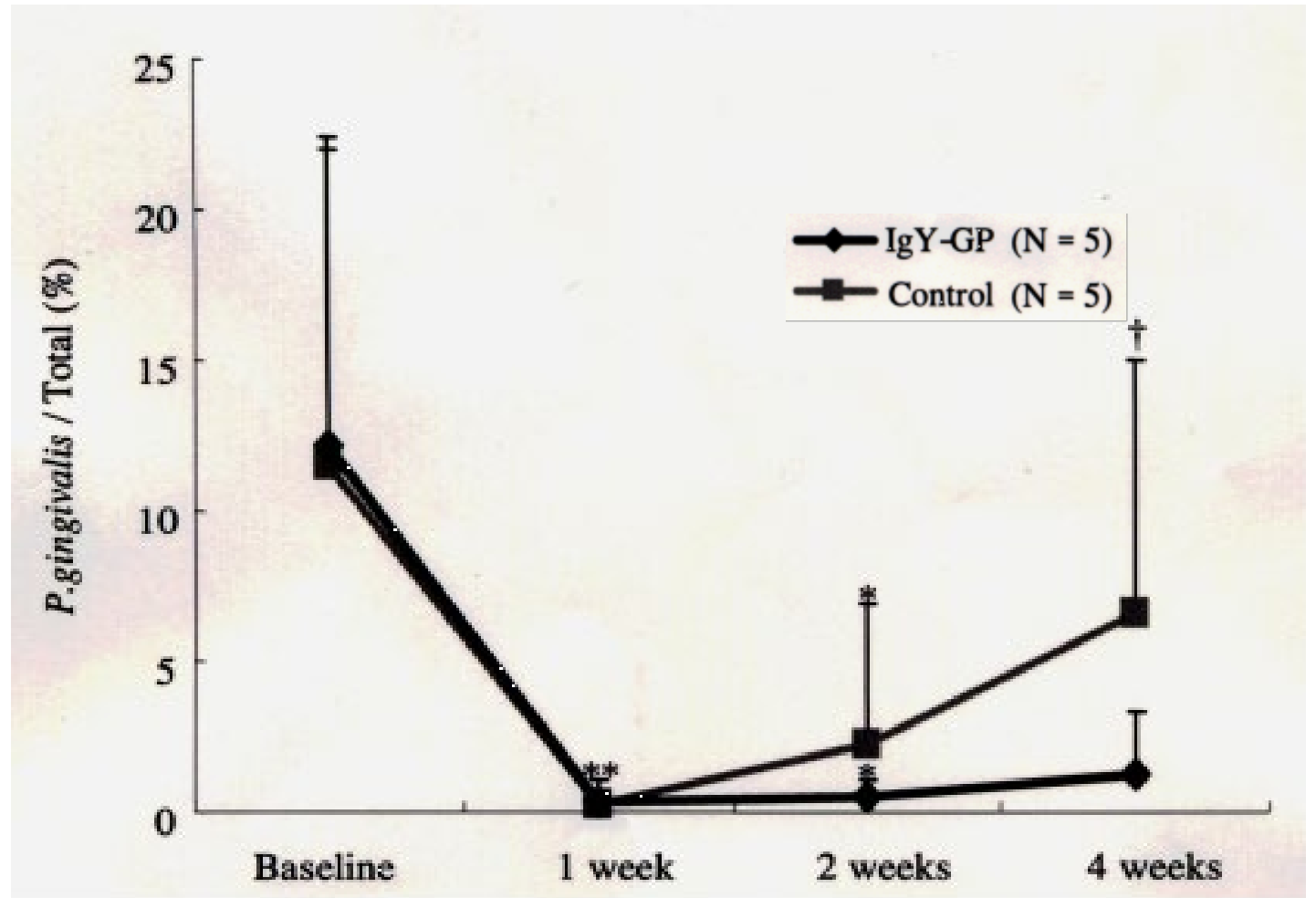
Test teeth (Left half of mouth)



Oral examination



Result: ratio of *P. gingivalis* in periodontal pocket



Wilcoxon signed-rank test * $P < 0.05$
Mann-whitney U test † $P < 0.05$

Remarks

- Specific IgY (PG) can prevent periodontitis development.
- To achieve better effects, IgY should easily reach periodontal pockets. Gel, chewing gums, etc., are among the most suitable forms of delivery.

Results from the last 2 years

- Number of periodontitis patients treated: 128
 - Patients having medium level periodontitis: 48
 - Examined *P. gingivalis* by PCR: 20
 - Examined by other methods: 101
 - Total positive patients: 83
- Patients using Specific IgY (PG) during treatment: 83

3 2 3	プログラム用基本検査 (4点法)															
7 4 3 3~7																
動揺度																
EPP・出血																
	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
EPP・出血																
動揺度																
【ブラークスコア=0%】																
	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8

3 2 3	プログラム用基本検査 (6点法)															
7 4 3 3~7																
動揺度																
EPP(血腫)																
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	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
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Results of PI examination:

Total PI (after)/total PI (before)

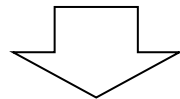
= avg 75%

(compared to 90% when not using Ovalgen)

Source: Yanagisawa dental clinic

Comments

- Using Specific IgY (PG) during treatment results in:
 - Faster recovery of periodontal bone
 - Less inflammation
 - Good prognosis even with very difficult cases



Replace antibiotics completely with IgY