

Helicobacter Pylori 및 Cytomegalovirus 감염이 관동맥 성형술 후 재협착에 미치는 영향

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The Effects of *Helicobacter Pylori* & Cytomegalovirus Infection on the Risk of Restenosis after Percutaneous Transluminal Coronary Angioplasty

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ABSTRACT

Background : Previous studies have suggested that chronic infection may play a role in the pathophysiology of restenosis after coronary angioplasty. The purpose of our study was to investigate the relation between *Helicobacter pylori* (*H. pylori*) or cytomegalovirus (CMV) infection, and restenosis. **Methods :** Fifty nine patients with coronary artery disease underwent percutaneous transluminal coronary angioplasty (PTCA) and follow-up coronary angiography (59 ± 13 years, 66% male). *H. pylori* and CMV IgG antibody titers were measured prospectively. The minimal luminal diameter and reference diameter before and immediately after angioplasty and at follow-up were measured with quantitative analysis. **Results :** Restenosis occurred in 23 of the 59 (39%) patients. For *H. pylori*, patients with high antibody titer (upper half, ≥ 40 U/ml) had a higher restenosis rate than patients with low antibody titer (lower half, <40 U/ml). Seventeen of the 29 (59%) patients with high antibody titer had restenosis, while 6 of the 30 (20%) patients with low antibody titer had restenosis ($p = 0.002$, RR = 2.39, 95% CI 1.35 to 6.37). After adjustment for covariates, including age, sex, body mass index, hypercholesterolemia, hypertension, diabetes mellitus, smoking, diagnosis at admission, modality of intervention, postprocedure minimal luminal diameter, lesion length, and lesion type, *H. pylori* antibody titer was independently predictive of restenosis ($p = 0.005$). For CMV, patients with high antibody titer did not have a higher restenosis rate than patients with low antibody titer. **Conclusion :** High antibody titer against *H. pylori* may be an independent risk factor of restenosis after PTCA. However, there was no association between CMV antibody titer and the risk of restenosis. (Korean Circulation J 2000;30(1):39-48)

KEY WORDS : *Helicobacter pylori* · Restenosis.

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서 론

re - jection) 가 가 .¹³⁾¹⁴⁾ CMV (graft

40% , 30 ,¹⁵⁾¹⁶⁾ ,¹⁷⁾¹⁸⁾ CMV

¹⁾²⁾ , CMV coronary atherectomy 가

1994 Mendall³⁾ 185 ,¹⁹⁾ CMV 가가 .²⁰⁾

(cross sectional) CMV

Helicobac - ,²¹⁾ , CMV가

ter pylori(*H. pylori*) IgG , *H. pylori* 가

(confoun - ding variables)

H. pylori ,^{4 - 6)} ,⁷⁾⁸⁾ , Caerph -

illy Prospective Heart Disease Study⁹⁾ , *H. pylori*

가 . Pasceri¹⁰⁾ *H. pylori* CMV

(genetic polymorphism) 가 가 , 가

cytotoxin - asso -

ciated gene - A(CagA) 가

대 상 및 방법

대 상

1996 1 1998 6

(balloon angioplasty stent

) , 3

1

¹²⁾ , cytomegalovirus(CMV)

59

39 (66%) . 59 (25 83) ,

22 (37%), 27 (46%),

10 (17%) .

CMV , 가

가 가

결 과

대상 환자 군의 특성

H. pylori CMV 가 Fig. 1
Table 1 and 2
H. pylori 69%(41/59)
40 U/ml CMV
54 U/ml
가 가
가 가

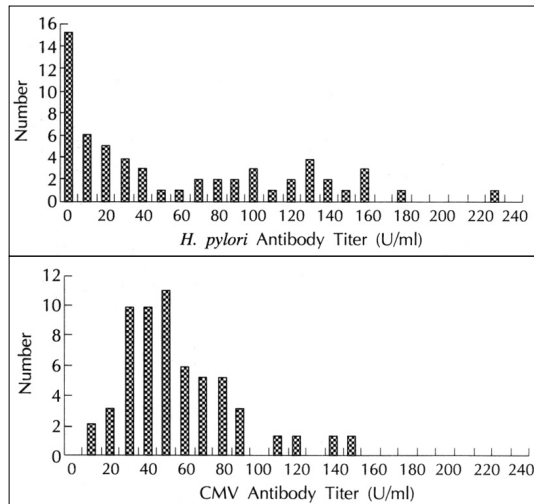


Fig. 1. The distribution of *H. pylori* and CMV antibody titer. Forty one of the 59 patients (69%) were seropositive for *H. pylori*. And, all 59 patients were seropositive for CMV.

Table 1. Main clinical features of patients according to *H. pylori* antibody titer

Risk factor	High titer group (n = 29)	Low titer group (n = 30)	P value*
Age, year	58 ± 12	59 ± 14	NS
Body mass index	24.2 ± 2.4	25.0 ± 2.0	NS
Male sex (%)	21 (72)	18 (60)	NS
Hypertension (%)	13 (46)	13 (43)	NS
Total cholesterol, mg/dl	203 ± 45	216 ± 40	NS
Current smoker (%)	10 (36)	13 (43)	NS
Diabetes (%)	6 (21)	8 (27)	NS
Acute coronary syndrome (%)	18 (62)	18 (61)	NS
Stent (%)	13 (45)	13 (43)	NS

NS : non-significant

*Univariate analysis

(Table 1). CMV 가 (Table 2).
st - ent 23/59 (39%)

H. pylori 감염과 관동맥 성형술 후 재협착의 연관성
H. pylori 46%(19/41),
22%(4/18) , *H. pylori*
(p=0.08). 가
59%(17/29), 가
20%(6/30) 가
(p=0.002, Fig. 2),
2.93, 95% 1.35 6.37

logistic regression
(p=0.005).
가 %
(p=0.16), loss index
(p=0.29, Table
3).

acute gain late loss
가 (Table 3). 가 가
20 U/ml 80 U/ml
가

Table 2. Main clinical features of patients according to cytomegalovirus antibody titer

Risk factor	High titer group (n = 29)	Low titer group (n = 30)	P value*
Age, year	57 ± 12	60 ± 13	NS
Body mass index	24.5 ± 2.4	24.8 ± 2.0	NS
Male sex (%)	16 (55)	23 (77)	NS
Hypertension (%)	17 (59)	9 (30)	0.035
Total cholesterol, mg/dl	219 ± 50	200 ± 33	NS
Current smoker (%)	12 (41)	11 (38)	NS
Diabetes (%)	8 (28)	7 (23)	NS
Acute coronary syndrome (%)	16 (55)	21 (70)	NS
Stent (%)	17 (59)	9 (30)	0.027

NS : non-significant

*Univariate analysis

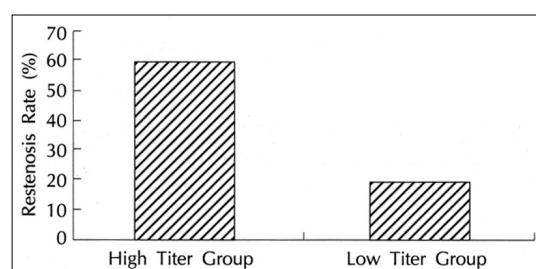


Fig. 2. The association between *H. pylori* antibody titer and the risk of restenosis after PTCA. Patients with high anti-body titer had a higher restenosis rate than patients with low antibody titer (59% vs. 20%, $p = 0.002$).

($p = 0.87$, Fig. 3).

항체 역가와 CRP의 관련성

25%(15/59) CRP 가
(0.5 mg/dl). CRP가
40%(6/15),
39%(17/44) , CRP

가 ($p = 0.93$). *H. pylori*

가 CRP

($r = 0.17$, $p = 0.21$, Fig. 4), CMV 가

CRP

가

($r = 0.092$, $p = 0.49$, Fig. 4).

다른 가능한 위험 인자들의 영향

(60), , (27.0),

, 가 (Table 5).

고 안

H. pylori 가

(Table 4).

Balloon angioplasty 33 (56%)

, *H. pylori* 가

63%(10/16) , 가

18%(3/17) 가

($p = 0.008$). Stent

26 (44%)

H. pylori 가 54%(10/16)

, 가 23%(3/10) ,

가 ,

($p = 0.10$).

CMV 항체 역가와 관동맥 성형술 후 재협착의 연관성

, CMV

CMV

가

가 가

, 가 38%(12/29

), 가 40%(12/30)

가

Table 3. Association between *H. pylori* status and angiographic findings

Angiographic finding	High titer group (n = 29)	Low titer group (n = 30)	P value*
MLD, pre-procedure (mm)	1.20 ± 0.42	1.28 ± 0.44	NS
MLD, post-procedure (mm)	2.28 ± 0.58	2.50 ± 0.53	NS
Reference diameter (mm)	2.99 ± 0.61	3.06 ± 0.58	NS
Lesion length (mm)	11.4 ± 7.0	14.4 ± 9.7	NS
Lesion type, A/B/C (patients) †	10 / 18 / 1	10 / 17 / 3	NS
Acute gain (mm)	1.09 ± 0.43	1.23 ± 0.55	NS
Late loss (mm)	0.79 ± 0.47	0.83 ± 0.63	NS
Loss index (%)	79 ± 53	65 ± 43	NS
% stenosis at follow-up	48 ± 18	42 ± 17	NS

*Univariate analysis

† Lesion type according to AHA/ACC

Table 4. Restenosis rate in the patients with high or low antibody titer according to various cutoff value

Cutoff value (U/ml)	Restenosis rate		P value*
	High titer group	Low titer group	
20	18/38 (48%)	5/21 (24%)	0.076
40	17/29 (59%)	6/30 (20%)	0.002
80	12/22 (55%)	11/37 (30%)	0.059

*Univariate analysis

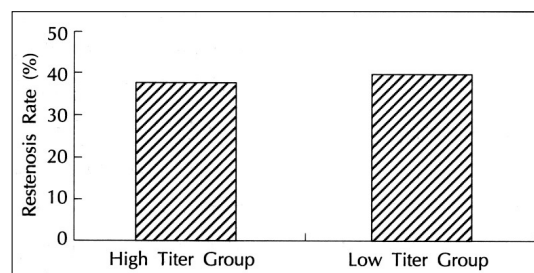


Fig. 3. The association between cytomegalovirus (CMV) antibody titers and the risk of restenosis after PTCA. CMV antibody titer was not associated with the risk of restenosis after PTCA. 12 of the 30 (40%) patients with high antibody titer had restenosis, while 11 of the 28 (39%) patients with low antibody titer had restenosis ($p = 0.871$).

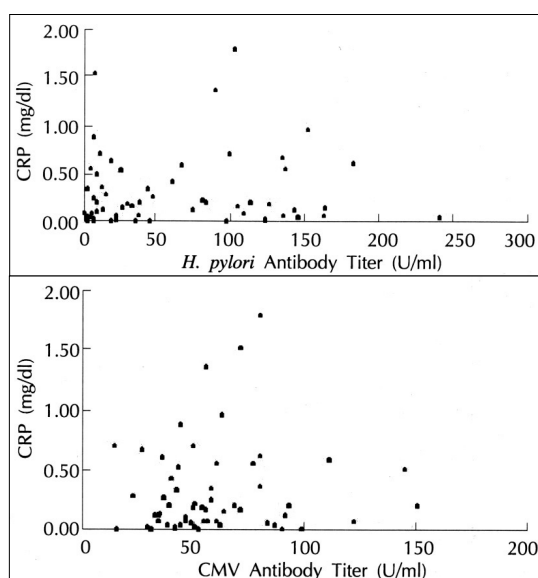


Fig. 4. The Correlation of *H. pylori* and CMV antibody titers with C-reactive protein (CRP) level. There was no significant association between antibody titers and CRP ($r = 0.166$, $p = \text{NS}$ for *H. pylori* and $r = 0.092$, $p = \text{NS}$ for CMV).

. *H. pylori* (confounding variable) , , , , , *H. pylori* 가 가 . , *H. pylori* 가 69% , 70 75% 22)23) 가 , 가 가

Table 5. Association between restenosis and potential risk factors

Risk factor	Number of patients (%)		P value*
	Restenosis (N = 23)	No restenosis (N = 36)	
Old age (≥ 60 yrs)	10 (35)	19 (65)	NS
Young age (< 60 yrs)	13 (43)	17 (57)	
Male sex	16 (41)	23 (59)	NS
Female sex	7 (35)	13 (65)	
Overweight (BMI ≥ 27.0)	4 (36)	7 (64)	NS
Standard weight (BMI < 27.0)	19 (41)	29 (59)	
Hypertension	10 (37)	17 (63)	NS
Normotension	13 (41)	19 (59)	
Diabetes	7 (47)	8 (53)	NS
Non-diabetes	16 (36)	28 (64)	
Hypercholesterolemia	6 (43)	8 (57)	NS
Normocholesterolemia	7 (38)	28 (62)	
Smoking	11 (46)	13 (54)	NS
Non-smoking	12 (34)	23 (66)	
Acute coronary syndromes	13 (35)	24 (65)	NS
Stable angina	10 (45)	12 (55)	

NS : non-significant

BMI : body mass index

*Univariate analysis

가 . , , 24)가 , 25)가 , 가 (atheromatous plaque) , (coronary endarterectomy) 26)27)가 가 H. pylori DNA , H. pylori가 CagA cytotoxin 26)27) Balloon angioplasty H. pylori , cytokine 10) H. , stent 가 pylori CRP 4)28) H. pylori , subgroup an - 가 4)5)29) H. alysis pylori heat - shock protein 60 30) lipopolysaccharide 12) Buffon , H. pylori CD 14 (polymorphism) , (allele) 가 31) H. pylori 가 H. pylori H. pylori가

, CagA lipopolysaccharide 가 가 , cytotoxin 가 .¹⁹⁾ 가 *H. pylori* 가 CRP , CRP 가 . CRP 가 , CMV CMV 가 , , 가 가 , CMV 가 가 ,³³⁾³⁴⁾ 가 1 4 가 , CRP 가 , CMV가 1 CRP³³⁾ 가 *H. py-* 가 가 .³³⁾ diate early gene product IE84가 가 , IE84 p53 gene product , (apoptosis) . , 가 ,³²⁾ , *H. pylori*가 가 CMV coronary atherectomy ,¹⁹⁾ 가 가 , 가가 가 stent CMV . *H. pylori* 가 .²¹⁾ 가 , CMV 가 . atherectomy atherectomy 요 약 7% , stent 연구대상 : 21% , atherectomy CMV가 30 ent 가 , st - 가 40% 가 . 가 , CMV 가 *H. pylori* CMV 가 stent 가 가 . 방 법 : 59 (59±13 , : =39 : 20) , . 가 . CMV .

H. pylori CMV 가

결 과 :

1) 39%(23/59)

H. pylori 가 59%(17/29) , 가 20%(6/30) , *H. pylori* 가 (p=0.002, 2.93, 95% 1.35 6.37).

logistic regression (p=0.005).

2) CMV 가 가 가 38%(11/29) , 가 40%(12/30) 가 (p=0.871).

결 론 :

H. pylori 가 가 가 가 가 . CMV 가

중심 단어 : *Helicobacter pylori* .

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