

한국인 관동맥 질환에서의 염증반응의 역할

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Role of Inflammation on Coronary Artery Disease in Koreans

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ABSTRACT

Background and Objectives : The prevalence of coronary artery disease is lower in Korea compared to most western countries. The increasing prevalence of the traditional atherosclerotic risk factors has been documented but the impact of inflammatory activity on coronary artery disease remains unclear. In this study, the role of inflammatory activity on coronary artery disease in Koreans was investigated. **Subjects and Methods :** This study included a consecutive cohort of 1057 patients who underwent coronary angiography. Patients with conditions that might change the CRP levels were excluded and 227 patients were finally enrolled. The CRP was measured using a highly sensitive Behring nephelometer BN II. **Results :** The mean CRP value of the enrolled patients was 1.06 ± 0.51 mg/L (median : 0.95 mg/L). There were no differences in the CRP levels (1.17 ± 0.57 vs. 0.92 ± 0.42 mg/L, $p = 0.11$) between patients with and without coronary artery disease. In logistic regression analysis, only the traditional risk factors (age, being male, hyperlipidemia, and diabetes) were independently associated with coronary artery disease. In patients with coronary artery disease, those with unstable angina had significantly higher CRP levels than those with stable angina (1.85 ± 0.94 vs. 0.97 ± 0.45 mg/L, $p = 0.02$). However, the CRP levels were not correlated with the angiographic severity. 16.7% (15/89) of coronary artery disease patients without hyperlipidemia had a CRP level >3 mg/L. **Conclusion :** The CRP level is not an independent risk factor for coronary artery disease in Koreans. However, the CRP level was higher in patients with unstable angina than in those with stable clinical conditions. (**Korean Circulation J 2002; 32(11):988-995**)

KEY WORDS : Inflammation ; C-Reactive protein ; Coronary arteriosclerosis.

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서 론

(205), (226),
¹⁾ (91), (17),
 (57), (74), (2), NYHA
 가 C - reactive protein(CRP) ²⁾³⁾ 45% (36), (28),
 (3) CK - MB
 troponin T 가(38)
 hs - CRP CRP
 22
 가
 (24)
⁴⁾ (7)
 CRP 227
^{5 - 8)} 가 CRP
 CRP가 Behring
 nephelometer BN (Behring Diagnostics, Marburg,
^{9 - 11)} 0.175 mg/L CV(coefficient of
 variation) 5%
^{12 - 15)} 30~70
 CRP 115 CRP 0.47 ± 0.19 mg/L(
 high sensitivity CRP(hs - CRP) : 0.45 mg/L)
 Braunwald가
 가 ¹⁶⁾
 20 30
 hs - CRP
 가 가 LDL
 130 mg/dL

대상 및 방법

kins ¹⁷⁾ Jud-
 50%
 2001 11 2002 3
 1,057 pigtail

50%

SPSS 10.0

Kolmogorov - Smirnov

CRP

CRP

(geometric mean)

unpaired t - test

ANOVA

가

Tuckey

CRP(logCRP)

enter

p 0.05

결 과

대상 환자의 임상적 특징

59.8 ± 9.8 가

58% 39% 가

가 19%, 37%,

53% 24%

128 (56%) (Table 1).

CRP 1.06 ± 0.51 mg/L(: 0.95, :

0.175~15.8 mg/L) CRP

Fig. 1

관동맥 질환 유무와 위험인자들과의 상관관계

(128) (99)

(Table 2).

가 (63 vs. 56 , p<0.001) 가

(64% vs. 50%, p=0.03) (27% vs. 10%,

p=0.001), (62% vs. 47%, p=0.04)

(30% vs. 16%, p=0.02)

Table 1. Baseline characteristics of the patients (n = 227)

Age (years)	59.8 ± 9.8
Male/Female	131/96 (58%/42%)
Body mass index (kg/m ²)	25.5 ± 2.8
Clinical diagnosis	
SA/UA/atypical pain/others	88/61/37/35 (39%/27%/16%/18%)
Risk factors	
DM/Smoking/Hypertension/ Hyperlipidemia	42/84/121/54 (19%/37%/53%/24%)
Coronary artery disease	
None/1VD/2VD/3VD	99/48/32/48 (44%/21%/14%/21%)
Medications	
ASA/ACEI or ARB/BB/CCB	217/49/77/52 (96%/21%/34%/23%)
CRP (mg/L)	1.06 ± 0.51 (median : 0.95)

SA : stable angina, UA : unstable angina, VD : vessel disease, ASA : aspirin, ACEI : angiotensin converting enzyme inhibitors, ARB : angiotensin receptor blockers, BB : beta-blockers, CCB : calcium channel blockers, CRP : C-reactive protein

가

가 (

: 98% vs. 94%, angiotensin

angiotensin : 23% vs. 19%). CRP

(1.17 ± 0.57 vs. 0.92 ± 0.42 mg/L,

p=0.11).

(Table 2).

임상 양상 및 관동맥 조영술 상 병변의 정도와 CRP 값과의 관계

CRP

(46) (82)

CRP , ,

가

(0.92 ± 0.43 mg/L)

(0.97 ± 0.45 mg/L) CRP

가 (1.85 ±

0.94 mg/L) CRP

(Fig. 2). Braunwald (13/82) 26.1%
 CRP (12/46)
 가 . CRP 3 mg/L (p<0.05).
 10.9% 128 CRP
 (14/128), 15.9% 1.17 ± 0.57 mg/L (: 1.0, :
 0.17, : 2.37, 25 percentile : 0.54, 75 percentile 2.37 mg/L)

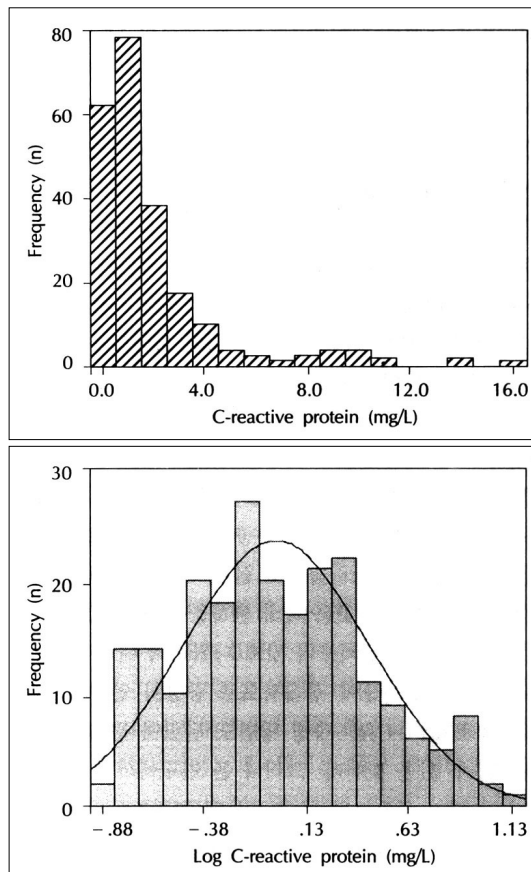


Fig. 1. Distribution of CRP and log normalized CRP values in 227 patients. CRP : C-reactive protein.

CRP 1, 2
 3 1.18 ± 0.60, 1.24 ± 0.46, 1.13
 ± 0.61 mg/L 가 .
 CRP
 CRP , ,
 , , HDL , LDL
 HDL
 LDL
 CRP

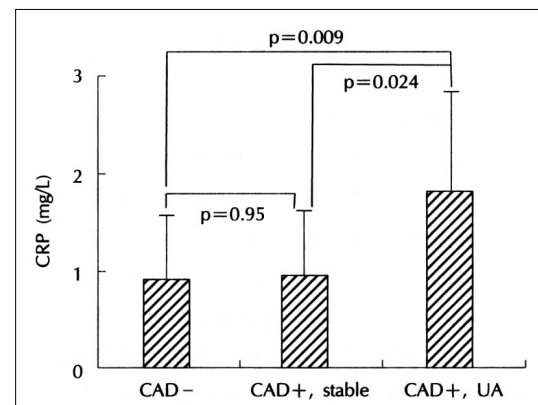


Fig. 2. C-reactive protein levels (mean ± SD) in three groups of patients divided by their angiographic and clinical findings. CRP : C-reactive protein, CAD : coronary artery disease, UA : unstable angina.

Table 2. Risk factors of patients with coronary artery disease compared with patients without coronary artery disease

	Univariate analysis		p	Multivariate analysis	
	CAD+ (n = 128)	CAD- (n = 99)			95% CI
Age (years)	63 ± 9	56 ± 10	0.001	1.09	1.05 - 1.13
Male sex (%)	64	50	0.03	3.16	1.37 - 7.32
BMI (kg/m ²)	25.5 ± 2.6	25.3 ± 3.0	0.9	1.02	0.92 - 1.14
Diabetes (%)	27	10	0.001	3.28	1.33 - 8.06
Hypertension (%)	62	47	0.04	1.88	0.98 - 3.62
Hyperlipidemia (%)	30	16	0.02	2.20	1.05 - 4.64
Smoking (%)	42	37	0.5	0.92	0.39 - 2.16
CRP (mg/L)	1.17 ± 0.57	0.92 ± 0.42	0.11	1.40	0.71 - 2.74

CAD : coronary artery disease, CI : confidence interval, BMI : body mass index, CRP : C-reactive protein

115 (: 20~70
 (: , 60) BN
 =0.214, p=0.03, LDL : =0.26, p=
 0.009). hs - CRP 0.47 mg/L(: 0.45, :
 0.17~6.89 mg/L) Ockene ²²⁾
 (89) CRP 2 mg/L 26 113 (: 30~70 , 64
 (28.9%) 3 mg/L 15 (16.7%)) 2.82 mg/L(: 1.42,
 : 0.1~16.2 mg/L) 5000
 1.6 mg/L ²¹⁾

고 찰

hs - CRP 가 가 1.17 mg/L(1.0 mg/L) Ridker ²³⁾
 CARE 3.6 mg/L(: 2.4 mg/L)
 . Ridker ¹⁸⁾ CRP
 CRP가
 가 3 가 가 가
 가 가 가
 CRP (acute phase reac- CRP
 tants) 1000 가 ¹⁹⁾ 12 - 15)
 hs - CRP CRP
 가 ²⁰⁾ 가
 hs - CRP 가
 가 CRP
 1,057 가 가
 가 CRP가
 BN CRP
 227 hs - CRP 2 mg/L 28.9%, 3 mg/L
 CRP 16.7% 가
 가
 15 mg/L ²¹⁾
 1 (15.8 mg/L) hs - CRP
 CRP

: 0.95 mg/L) .
(128) (99) CRP
가 (1.17 ± 0.57 vs. 0.92 ± 0.42 mg/L,
p=0.11).

(46) CRP
(82) (1.85 ± 0.94 vs. 0.97
± 0.45 mg/L, p=0.02).

CRP .
CRP 3 mg/L
16.7%(15/89) .

결 론 :

CRP 가

중심 단어 : ; C - Reactive protein ;

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