

한국인에서 Hepatic Lipase 유전자 Promoter의 C-514T 다형성과 혈중 고밀도지단백 콜레스테롤과의 관계

1, 2, 3

박경우^{1,2,3} · 채인호^{1,2,3} · 최진호^{1,2,3} · 주재란^{1,3} · 오세일^{1,2,3} · 김철호^{1,2,3}
손대원^{1,2,3} · 오병희^{1,2,3} · 이명묵^{1,2,3} · 박영배^{1,2,3} · 최윤식^{1,2,3}

The Relationship of the C-514T Polymorphism of the Human Hepatic Lipase Gene Promoter with Plasma HDL-C Concentrations in Koreans

Kyung-Woo Park, MD^{1,2,3}, In-Ho Chae, MD^{1,2,3}, Jin-Ho Choi, MD^{1,2,3}, Jae-Ran Ju, MS^{1,3},
Seil Oh, MD^{1,2,3}, Cheol-Ho Kim, MD^{1,2,3}, Dae-Won Sohn, MD^{1,2,3}, Byung-Hee Oh, MD^{1,2,3},
Myoung-Mook Lee, MD^{1,2,3}, Young-Bae Park, MD^{1,2,3} and Yun-Shik Choi, MD^{1,2,3}

¹Heart Research Institute, Seoul National University Medical Research Institute, Seoul,

²Department of Internal Medicine, Seoul National University College of Medicine, Seoul,

³Cardiovascular Research Laboratory, Seoul National University Hospital, Seoul, Korea

ABSTRACT

Background and Objectives : Hepatic lipase is a key enzyme in high density lipoprotein-cholesterol (HDL-C) metabolism and may therefore influence the susceptibility to coronary artery disease (CAD). Furthermore, there seems to be genetic variation in the -514T allele frequency among different races. **Subjects and Methods** : To assess the -514T allele frequency in Koreans, 99 subjects (54 patients with coronary artery disease & 45 normal controls) were examined by polymerase chain reaction (PCR) and restriction enzyme digestion. The lipid profiles of the subjects were also obtained. **Results** : The -514T allele frequency was 0.33 in the CAD group and 0.41 in the normal controls, results which are higher than the equivalent reported for Caucasians. The plasma lipid profiles did not differ significantly between genotypes. **Conclusion** : These data indicate that the Koreans in this study have a higher -514T allele frequency than that reported for Caucasians. This elevation may be partly responsible for the higher HDL-C level in Koreans, although such polymorphism does not seem to significantly influence plasma HDL-C levels or CAD susceptibility. (**Korean Circulation J 2002; 32(1):25-30**)

KEY WORDS : Lipase ; Polymorphism ; Lipoproteins ; Coronary disease.

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: (02) 760 - 2684 · : (02) 766 - 8944 · E - mail : ihchae@snu.ac.kr

서론

(HDL cholesterol, HDL - C) HDL - C 가 ¹⁾²⁾ HDL - C ³⁾⁴⁾ ⁵⁾⁶⁾ HDL - C 40 60%가 ⁷⁾ hepatic lipase HDL - C ⁸⁾⁹⁾ HDL - C 가 ¹⁰⁾ Hepatic lipase (polytic enzyme) ¹¹⁾¹²⁾ sinusoidal space of Disse (parenchymal cell) (microvilli) ¹³⁾¹⁴⁾ Hepatic lipase (pho - pholipid) 가 (catalyze) ¹¹⁾¹⁵⁾ (hi - gh density lipoprotein) reverse cholesterol transport(RCT) HDL - C Hepatic lipase reverse cholesterol transport (intermediate density lipoprotein) large triglyceriderich HDL2 가 atherogenic small, dense LDL small, dense HDL3 ¹⁶⁾ Hepatic lipase 15 21 9 exon 35kb DNA ^{17 - 20)} hepatic lipase ase hepatic lipase (polymorphism) 가 ^{9)21 - 23)} hepatic lipase promoter region C - 514T HDL - C ²¹⁾

C - 514T

(genotype)

HDL -

C 가 가 가

대상 및 방법

대 상

1995 10 1996 5 DNA 가 가 99 54

45

50%

profile

, LDL - C

Friedewald equation

²⁴⁾

다형성의 분석

DNA

. Transcription initiation site 514bp upstream C T substitution 5' - AAG AAG TGT GTT TAC TCT AGG ATC A - 3' 5' - GGT GGC TTC CAC GTG GCT GCC TAA G - 3' primer

(PCR) (5' - CATG - 3')

가 299bp (DNA fragment)

, Hsp92II(Promega, Madison, USA)

, agarose gel

protocol ²¹⁾²³⁾

통 계

- 514T allele

Hardy - Weinberg

equilibrium

² test

t - test

ANOVA

결 과

0.33 0.41

대상 환자와 기본적 임상 특징 및 지질 profile

Hardy - Weinberg expectation

Ta -

Table 1

ble 2

Hardy -

LDL cholesterol

(p<

Weinberg expectation

0.05).

혈중 지질과 지단백에 대한 -514T allele의 영향

한국인에서의 -514T allele의 빈도

DNA

- 514T allele

Table 1. Baseline clinical characteristics

	Total	CAD	Normal
Number of patients	99	54	45
Age (mean)	57.9 ± 8.9	59.3 ± 8.5	56.1 ± 9.2
M : F	61 : 38	35 : 19	26 : 19
Smokers	36	23	13
DM	19	14	5
HTN	43	26	17
TC (mg/dL)*	205.9 ± 45.7	220.1 ± 49.7	188.9 ± 33.7
Triacylglycerol (mg/dL)	150.6 ± 110.4	167.8 ± 133.4	130.1 ± 70.3
HDL-C (mg/dL)	43.1 ± 11.6	42.7 ± 11.0	43.5 ± 11.6
LDL-C (mg/dL)*	132.8 ± 37.7	143.5 ± 40.2	119.9 ± 30.26

CAD : coronary artery disease, M : male, F : female, DM : diabetes mellitus, HTN : hypertension, TC : total cholesterol, HDL-C : high density lipoprotein-cholesterol, LDL-C : low density lipoprotein-cholesterol, * : CAD vs Normal (p<0.05)

Table 2. C-514T genotype frequency (number of patients)

Alle frequency	Total		CAD		Normal	
	Obs	Exp	Obs	Exp	Obs	Exp
CC	37	39.5	22	24	15	15.6
CT	51	46.1	28	24	23	21.8
TT	11	13.5	4	6	7	7.61

The genotype frequency is listed as number of patients observed and expected. The frequency of the -514T allele was 0.33 and 0.41 for CAD and normal group, respectively, which was statistically insignificant. The observed frequencies were consistent with the Hardy-Weinberg expectation. CAD : coronary artery disease, Obs : observed number of patients, Exp : expected number of patients, CC : CC genotype, CT : CT genotype, TT : TT genotype

Table 3. Lipid profiles among different genotypes

LIPC Genotype	Total			CAD			Normal		
	CC	CT	TT	CC	CT	TT	CC	CT	TT
N	37	51	11	22	28	4	15	23	7
TC	204.6 ± 39.4	210.5 ± 52.3	189.0 ± 27.4	214.2 ± 41.0	228.1 ± 57.7	196.5 ± 16.6	190.6 ± 33.5	189.0 ± 35.5	184.7 ± 32.4
TG	142.2 ± 81.7	169.2 ± 132.5	92.8 ± 44.8	145.2 ± 89.7	192.7 ± 163.9	117.3 ± 56.1	137.9 ± 71.3	140.6 ± 73.2	78.9 ± 33.8
HDL-C	41.4 ± 12.3	43.3 ± 10.7	47.7 ± 9.6	42.3 ± 13.3	42.4 ± 8.8	47.5 ± 13.5	40.1 ± 11.0	44.4 ± 12.7	47.9 ± 7.9

All lipid profile values are given as mean ± SD (mg/dL). Although, mean HDL-C level was higher in the TT genotype compared with the CC and CT genotype, this was not statistically significant and lipid profile did not differ significantly among different genotypes. N : number of patients, CAD : coronary artery disease, CC : CC genotype, CT : CT genotype, TT : TT genotype, TC : total cholesterol, TG : triglyceride, HDL-C : high density lipoprotein-cholesterol

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hepa -
tic lipase C - 514T
HDL - C
- 514T allele HDL - C
HDL -
C hepatic lipase
HDL - C
가 HDL - C

결 론 :
- 514T
allele 가 HDL - C
C - 514T

중심 단어 : ; ; ;

(119990030)

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요 약

배경 및 목적 :

Hepatic lipase HDL - C
가
hep -
atic lipase promoter C - 514T
가
C - 514T
HDL - C 가
가
가

방 법 :

54
45 profile

결 과 :

- 514T allele 0.33
0.41
, HDL - C

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