

1 2  
,  
3

106

## 서명: \_\_\_\_\_

가  
가 .  
2 4 , 가  
2 3 .  
가 ,  
가 .<sup>1)</sup>  
가 ,  
가 .<sup>2)</sup>  
50%  
가 ,  
가 .  
가 , 가 520 461 ( 291 ,  
170 ) , 59 ( 28 , 31 )  
가 ,  
가 ,  
가 .<sup>3)</sup>

## 방편

4-8)

(kg/m<sup>2</sup>) 25 kg/m<sup>2</sup>

가

9-11)

2

pack year

가

WHO

140 mmHg 90 mmHg

## 대상 및 방법

대 상

1998 6 2001 4

ADA(Ameriacan Diabetes Association)

126 mg/dL

2

2

2

(

test  
 chi-square test  
 95%  
 95%  
 0.05  
 linear by lin-  
 ear association  
 8 24  
 30 mg, 30 300 mg/day  
 , 300 mg/day

## 결 과

환자군과 대조군간의 위험 인자 평균치 비교(Table 1 - 3)

가  
 64.2 60.5  
 가  
 40%  
 HbA<sub>1c</sub>, HDL -  
 , BUN, creatinine . LDL -  
 400 mg/dL  
 , 400 mg/dL Friedewald  
 240 mg/dL  
 , LDL - 160 mg/dL , HDL -  
 40 mg/dL  
 가 50%

## 통계 분석

SPSS 10.0  
 Student t - test  
 chi-square test, Fisher's exact

**Table 1.** Mean values of basic demographics and metabolic variables among male diabetic patients

	Male		p
	CAD n=291	Control n=28	
	Mean ± SD	Mean ± SD	
Age (yrs)	61.8 ± 8.9	58.8 ± 10.4	0.090
BMI (kg/m <sup>2</sup> )	24.3 ± 2.5	24.2 ± 2.5	0.682
Duration of DM (yrs)	10.7 ± 8.4	8.9 ± 7.5	0.281
24HU protein (mg/day)	1187.4 ± 2345.7	2094.0 ± 4048.3	0.351
FBS (mg/dL)	161.3 ± 56.5	154.2 ± 61.7	0.529
HbA <sub>1c</sub> (%)	8.1 ± 1.7	7.4 ± 1.6	0.041
TC (mg/dL)	193.3 ± 41.7	176.9 ± 43.5	0.048
TG (mg/dL)	156.0 ± 92.1	164.8 ± 100.1	0.652
HDL (mg/dL)	41.8 ± 10.6	44.3 ± 11.9	0.269
LDL (mg/dL)	122.2 ± 35.2	102.6 ± 34.6	0.008
TC/HDL	4.9 ± 1.4	4.2 ± 1.0	0.013
BUN (mg/dL)	22.3 ± 18.3	26.6 ± 24.5	0.379
Cr (mg/dL)	1.5 ± 1.8	2.2 ± 2.7	0.272
EchoCG EF (%)	53.7 ± 12.0	58.4 ± 11.3	0.049

CAD : coronary artery disease, BMI : body-mass index, DM : diabetes mellitus, 24HU protein : 24 hour urine protein, FBS : fasting blood sugar, HbA<sub>1c</sub> : glycated hemoglobin, TC : total cholesterol, TG : triglyceride, HDL : high density lipoprotein cholesterol, LDL : low density lipoprotein cholesterol, BUN : blood urea nitrogen, Cr : serum creatinine, EchoCG EF : ejection fraction on echocardiography

**Table 2.** Mean values of basic demographics and metabolic variables among female diabetic patients

	Female		p
	CAD n=170	Control n=31	
	Mean ± SD	Mean ± SD	
Age (yrs)	64.2 ± 7.6	60.5 ± 9.0	0.016
BMI (kg/m <sup>2</sup> )	25.5 ± 3.6	24.7 ± 3.0	0.236
Duration of DM (yrs)	11.9 ± 8.1	5.9 ± 5.7	<0.001
24HU protein (mg/day)	1136.4 ± 2564.5	974.8 ± 1972.2	0.801
FBS (mg/dL)	164.6 ± 60.8	150.8 ± 54.2	0.242
HbA <sub>1c</sub> (%)	8.3 ± 1.9	7.8 ± 1.9	0.107
TC (mg/dL)	210.0 ± 49.9	201.2 ± 46.5	0.342
TG (mg/dL)	181.3 ± 113.1	173.7 ± 78.8	0.744
HDL (mg/dL)	44.3 ± 12.7	45.7 ± 7.8	0.469
LDL (mg/dL)	128.6 ± 44.4	123.2 ± 38.9	0.482
TC/HDL	4.4 ± 3.2	4.6 ± 1.2	0.154
BUN (mg/dL)	19.3 ± 11.3	19.6 ± 16.5	0.920
Cr (mg/dL)	1.4 ± 1.7	1.9 ± 2.8	0.134
EchoCG EF (%)	56.4 ± 11.3	62.9 ± 8.4	0.003

CAD : coronary artery disease, BMI : body-mass index, DM : diabetes mellitus, 24HU protein : 24 hour urine protein, FBS : fasting blood sugar, HbA<sub>1c</sub> : glycated hemoglobin, TC : total cholesterol, TG : triglyceride, HDL : high density lipoprotein cholesterol, LDL : low density lipoprotein cholesterol, BUN : blood urea nitrogen, Cr : serum creatinine, EchoCG EF : ejection fraction on echocardiography

**Table 3.** Mean values of basic demographics and metabolic variables among total diabetic patients

	Total		p
	CAD n=461	Control n=59	
	Mean ± SD	Mean ± SD	
Age (yrs)	62.7 ± 8.6	59.7 ± 9.6	0.013
BMI (kg/m <sup>2</sup> )	24.8 ± 3.0	24.4 ± 2.7	0.395
Duration of DM (yrs)	11.2 ± 8.3	7.3 ± 6.7	0.001
24HU protein (mg/day)	1167.6 ± 2428.0	1549.5 ± 3217.6	0.493
FBS (mg/dL)	162.5 ± 58.1	152.4 ± 57.3	0.209
HbA <sub>1c</sub> (%)	8.2 ± 1.7	7.6 ± 1.7	0.017
TC (mg/dL)	199.6 ± 45.7	189.6 ± 46.4	0.116
TG (mg/dL)	165.3 ± 100.8	169.4 ± 88.9	0.780
HDL (mg/dL)	42.8 ± 11.5	45.0 ± 9.9	0.176
LDL (mg/dL)	124.9 ± 39.2	113.2 ± 37.9	0.043
TC/HDL	4.9 ± 1.4	4.4 ± 1.1	0.008
BUN (mg/dL)	21.3 ± 16.1	22.9 ± 20.8	0.556
Cr (mg/dL)	1.5 ± 1.8	2.0 ± 2.8	0.142
EchoCG EF (%)	54.7 ± 11.8	60.7 ± 10.1	<0.001

CAD : coronary artery disease, BMI : body-mass index, DM : diabetes mellitus, 24HU protein : 24 hour urine protein, FBS : fasting blood sugar, HbA<sub>1c</sub> : glycated hemoglobin, TC : total cholesterol, TG : triglyceride, HDL : high density lipoprotein cholesterol, LDL : low density lipoprotein cholesterol, BUN : blood urea nitrogen, Cr : serum creatinine, EchoCG EF : ejection fraction on echocardiography

, HbA<sub>1c</sub>, 24  
24  
, BUN, cr -  
eatinine  
가  
가 11.9  
5.9 . HbA<sub>1c</sub>  
가 8.1%  
7.4%  
HDL -  
가 , LDL -  
, /HDL -  
가 , 193.  
3 mg/dL, 122.2 mg/dL, 4.9 176.9 mg/dL,

102.6 mg/dL, 4.2  
53.7%, 56.4% 58.4%, 62.9%  
환자군과 대조군간의 임상인자 빈도 비교(Table 4 - 6)  
AHA(American Heart Association) ADA Consensus Development Conference(1998, Miami, Florida)<sup>1)</sup>  
5가 (  
가 ,  
가 , 1 , 2



**Table 6.** Prevalence of clinical factors among total diabetic patients

		Total		p
		CAD	Control	
		n=461	n=88	
		No (%)	No (%)	
Age	45,	433 (93.9)	50 (84.7)	0.010
F	25 (kg/m <sup>2</sup> )			
Male		291 (63.1)	28 (47.5)	0.020
BMI	25 (kg/m <sup>2</sup> )	210 (45.6)	26 (44.1)	0.829
HT		324 (70.3)	35 (59.3)	0.086
Smoking		177 (40.1)	12 (20.7)	0.004
FHx of CAD		34 ( 7.4)	3 ( 5.1)	0.374
Duration of DM				
10 (yrs)		255 (56.8)	23 (39.7)	0.014
Tx (insulin)		129 (28.0)	15 (25.4)	0.679
HbA <sub>1c</sub>	7.5 (%)	253 (61.6)	21 (38.9)	0.001
Retinopathy		161 (50.9)	15 (31.3)	0.011
Nephropathy		189 (78.4)	20 (54.1)	0.002
ASO		26 ( 5.8)	2 ( 3.4)	0.363
Peripheral vascular ds.		94 (57.7)	3 (33.3)	0.139
EF <50 (%)		122 (26.7)	5 ( 8.6)	0.001
Dyslipidemia		262 (59.1)	20 (38.5)	0.004
TC	240 (mg/dL)	77 (16.7)	8 (13.6)	0.539
LDL	160 (mg/dL)	68 (15.3)	5 ( 9.6)	0.190
HDL	60 (mg/dL)	39 ( 8.8)	3 ( 5.8)	0.336
HDL <40 (mg/dL)		202 (45.5)	13 (25.0)	0.005

CAD : coronary artery disease, BMI : body-mass index, HT : hypertension, FHx of CAD : family history of coronary artery disease, DM : diabetes mellitus, Tx (insulin) : insulin treatment, ASO : arteriosclerosis obliterans, EF : ejection fraction, TC : total cholesterol, TG : triglyceride, LDL : low-density lipo protein cholesterol, HDL : high density lipoprotein cholesterol

가 , 59.0%  
22.2% . HDL - 40  
mg/dL  
가 , 38.7%  
11.1% . 240  
mg/dL , LDL - 160 mg/dL  
, HDL - 60 mg/dL  
가 .

50%

29.3%, 22.4%

10.7%,

6.7%

각각의 위험 인자에 대한 관상동맥 병변의 교차 비  
(Table 7)

2.4  
(1.1 5.4), HbA<sub>1c</sub> 7.5% 가 2.3(1.0  
5.3), 3.5(1.3 9.4),  
50% 가 3.4(1.0 11.7)  
2.9(1.3 6.8), HbA<sub>1c</sub> 7.5% 2.6(1.1  
6.0), 3.6(1.3 9.7),  
50% 가 3.5(1.0 11.8)  
3.  
2(1.4 7.3), HbA<sub>1c</sub> 7.5% 가 2.9(1.3  
6.6), 10 3.6(1.6 8.4),  
3.2(1.2 8.2), 5.  
0(1.9 13.2), HDL - 40 mg/dL  
4.9(1.4 17.1)  
3.3(1.4 7.4), HbA<sub>1c</sub> 7.5% 가  
3.5(1.5 8.2), 10 4.  
2(1.5 11.5), 3.7(1.4 9.7),  
5.1(1.9 13.4), HDL - 40  
mg/dL 4.8(1.4 16.7)  
45  
, 55 2.8(1.2 6.2), 가 1.9(1.1  
3.3), 2.6(1.3 5.0), 10  
가 2.0(1.1 3.5), HbA<sub>1c</sub> 7.5%  
2.5(1.4 4.5), 2.3(1.2 4.4),  
3.1(1.5 6.3),  
50% 가 3.9(1.5 9.9),  
2.3(1.3 4.2), HDL - 40 mg/dL  
2.5(1.3 4.8)  
가 1.0  
(1.0 1.1), 3.1(1.6 6.3),  
10 2.4(1.2 4.7), HbA<sub>1c</sub> 7.5%  
2.8(1.5 5.1), 2.3(1.2 4.3),  
3.2(1.6 6.7),

**Table 7.** Odds ratio and 95% confidence interval for CAD in type 2 diabetic patients

	Male		Female		Total	
	OR (95% CI)		OR (95% CI)		OR (95% CI)	
	Univariate	Adjust for age	Univariate	Adjust for age	Univariate	Adjust for age
Age M 45, F 55 (yrs)	2.4 (0.6 - 8.8)	2.9 (1.0 - 8.6)	2.7 (0.9 - 7.6)	2.7 (0.9 - 7.6)	2.8 (1.2 - 6.2) <sup>†</sup>	3.2 (1.6 - 6.2)
Male	-	-	-	-	1.9 (1.1 - 3.3)*	1.0 (1.0 - 1.1)
BMI 25 (kg/m <sup>2</sup> )	1.2 (0.5 - 2.7)	1.3 (0.6 - 3.0)	1.1 (0.5 - 2.4)	1.2 (0.5 - 2.5)	1.1 (0.6 - 1.8)	1.1 (0.6 - 2.0)
HT	1.1 (0.5 - 2.5)	1.1 (0.5 - 2.4)	3.2 (1.4 - 7.3) <sup>†</sup>	3.3 (1.4 - 7.4)	1.6 (0.9 - 2.8)	1.5 (0.9 - 2.7)
Smoking	2.4 (1.1 - 5.4)*	2.9 (1.3 - 6.8)	1.1 (0.1 - 9.7)	1.1 (0.1 - 10.0)	2.6 (1.3 - 5.0) <sup>†</sup>	3.1 (1.6 - 6.3)
FHx of CAD	0.8 (0.2 - 3.5)	0.9 (0.2 - 4.1)	3.6 (0.5 - 27.6)	4.5 (0.6 - 36.1)	1.5 (0.4 - 5.0)	1.7 (0.5 - 5.9)
Duration of DM 10 (yrs)	1.1 (0.5 - 2.5)	1.6 (0.6 - 3.9)	3.6 (1.6 - 8.4) <sup>‡</sup>	4.2 (1.5 - 11.5)	2.0 (1.1 - 3.5)*	2.4 (1.2 - 4.7)
Tx (insulin)	0.7 (0.3 - 1.7)	0.7 (0.3 - 1.7)	2.0 (0.8 - 5.0)	2.1 (0.8 - 5.2)	1.1 (0.6 - 2.1)	1.1 (0.6 - 2.1)
HbA <sub>1c</sub> 7.5 (%)	2.3 (1.0 - 5.3)*	2.6 (1.1 - 6.0)	2.9 (1.3 - 6.6) <sup>†</sup>	3.5 (1.5 - 8.2)	2.5 (1.4 - 4.5) <sup>‡</sup>	2.8 (1.5 - 5.1)
Retinopathy	1.7 (0.7 - 4.3)	1.6 (0.7 - 4.1)	3.2 (1.2 - 8.2)*	3.7 (1.4 - 9.7)	2.3 (1.2 - 4.4)*	2.3 (1.2 - 4.3)
Nephropathy	3.5 (1.3 - 9.4)	3.6 (1.3 - 9.7)	2.6 (0.9 - 7.3)	2.9 (0.9 - 8.4)	3.1 (1.5 - 6.3) <sup>†</sup>	3.2 (1.6 - 6.7)
Peripheral vascular ds.	1.4 (0.3 - 7.1)	1.4 (0.3 - 7.8)	1.1 (1.0 - 1.3)	-	2.7 (0.7 - 11.2)	3.1 (0.7 - 13.2)
ASO	0.9 (0.2 - 4.1)	0.7 (0.1 - 3.3)	1.2 (1.1 - 1.3)	-	1.7 (0.4 - 7.4)	1.4 (0.3 - 6.0)
EF <50 (%)	3.4 (1.0 - 11.7)*	3.5 (1.0 - 11.8)	4.0 (0.9 - 17.7)*	3.6 (0.8 - 15.8)	3.9 (1.5 - 9.9) <sup>‡</sup>	3.8 (1.5 - 9.8)
Dyslipidemia	1.1 (0.5 - 2.6)	1.2 (0.5 - 2.7)	5.0 (1.9 - 13.2) <sup>‡</sup>	5.1 (1.9 - 13.4)	2.3 (1.3 - 4.2) <sup>‡</sup>	2.4 (1.3 - 4.4)
TC 240 (mg/dL)	0.8 (0.3 - 2.6)	0.9 (0.3 - 2.7)	2.1 (0.7 - 6.5)	2.4 (0.8 - 7.3)	1.3 (0.6 - 2.8)	1.3 (0.6 - 2.9)
LDL 160 (mg/dL)	1.6 (0.4 - 7.0)	1.6 (0.4 - 6.9)	2.1 (0.6 - 7.3)	2.2 (0.6 - 7.8)	1.7 (0.7 - 4.4)	1.7 (0.6 - 4.4)
HDL 60 (mg/dL)	0.9 (0.2 - 4.0)	0.8 (0.2 - 3.8)	3.3 (0.4 - 26.4)	3.3 (0.4 - 26.1)	1.6 (0.5 - 5.3)	1.5 (0.5 - 5.0)
HDL <40 (mg/dL)	1.5 (0.7 - 3.4)	1.5 (0.7 - 3.6)	4.9 (1.4 - 17.1) <sup>†</sup>	4.8 (1.4 - 16.7)	2.5 (1.3 - 4.8) <sup>†</sup>	2.6 (1.3 - 5.0)

CAD : coronary artery disease, BMI : body-mass index, HT : hypertension, FHx of CAD : family history of coronary artery disease, DM : diabetes mellitus, Tx (insulin) : insulin treatment, ASO : arteriosclerosis obliterans, EF : ejection fraction, TC : total cholesterol, TG : triglyceride, LDL : low density lipoprotein cholesterol, HDL : high density lipoprotein cholesterol, CI : confidence interval, \* : p<0.05, † : p<0.01, ‡ : p<0.005

50% 가 3.8(1.5 9.8), (p=0.003),  
 2.3(1.3 4.4), HDL - 40 mg/dL 10 (p=0.005), HDL - 40 mg/dL  
 2.6(1.3 5.0) . (p=0.006)

#### 관상동맥 병변에 대한 독립적인 위험 인자 양상의 다변량

분석(Table 8)

당뇨병의 유병 기간과 관상동맥 병변과의 관계(Table 9, 10)

10 , 11  
 (p=0.002), (p=0.003), 20 21 10  
 10 (p=0.030), HbA<sub>1c</sub> 7.5% (p<0. 가 2.1(1.1 4.2), 7.9(1.1  
 001), HDL - 40 mg/dL (p= 58.8) , 11 10  
 0.010) 가 2.6(1.4 5.1) (p=0.003).  
 (p=0.004), 10 21  
 10 (p=0.017), HbA<sub>1c</sub> 7.5% (p<0. , 3  
 001), HDL - 40 mg/dL (p= 10 21  
 0.005) 가 (p<0.001).

**Table 8.** Multivariate analysis of clinical factors for coronary artery disease on coronary angiography in diabetes patients

	Male		Female		Total	
	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
HT	-	-	2.2 (1.3 - 3.7)	0.003	2.2 (1.3 - 3.7)	0.002
Smoking	2.5 (1.4 - 4.8)	0.004	-	-	3.0 (1.5 - 6.0)	0.003
Duration of DM 10 (yrs)	2.7 (1.2 - 6.0)	0.017	3.1 (1.4 - 6.8)	0.005	2.0 (1.1 - 3.6)	0.030
HbA <sub>1c</sub> 7.5 (%)	3.4 (1.7 - 6.8)	<0.001	-	-	3.1 (1.7 - 5.7)	<0.001
HDL <40 (mg/dL)	2.7 (1.3 - 5.2)	0.005	4.1 (1.5 - 11.1)	0.006	2.5 (1.2 - 4.9)	0.010

In male, variables enters on step 1 were hypertension, smoking, duration of DM 10 years, HbA<sub>1c</sub> 7.5%, HDL <40 mg/dL. In female, variables enters on step 1 were age 55 years, hypertension, duration of DM 10 years, HbA<sub>1c</sub> 7.5%, EchoCG EF <50%, HDL <40mg/dL. In total, variables enters on step 1 was age, sex, hypertension, smoking, duration of DM 10 years, HbA<sub>1c</sub> 7.5%, HDL <40 mg/dL. OR : odds ratio, HT : hypertension, DM : diabetes mellitus, HbA<sub>1c</sub> : glycated hemoglobin, HDL : high density lipoprotein cholesterol

**Table 9.** Correlation between duration of diabetes and coronary angiographic findings among diabetic patients

Duration of DM	CAD N (%)	Control N (%)	Total N (%)	OR (95% CI)	p
0 - 10 (yrs)	267 (85.3)	46 (14.7)	313 (100)	1.0	
11 - 20 (yrs)	136 (92.5)	11 ( 7.5)	147 (100)	2.1 (1.1 - 4.2)	0.032*
21 - (yrs)	46 (97.9)	1 ( 2.1)	47 (100)	7.9 (1.1 - 58.8)	0.043*
0 - 10 (yrs)	267 (85.3)	46 (14.7)	313 (100)	1.0	
11 - (yrs)	182 (93.8)	12 ( 6.2)	194 (100)	2.6 (1.4 - 5.1)	0.003*
	449 (88.6)	58 (11.4)	507 (100)		

DM : diabetes mellitus, CAD : coronary artery disease, OR : odds ratio, \* : compared with duration of DM 0 - 10 yrs group

**Table 10.** Correlation between duration of diabetes and numbers of diseased vessels on coronary angiography among diabetic patients

Duration of DM	Normal N (%)	1VD N (%)	2VD N (%)	3VD N (%)	Total N (%)
0 - 10 (yrs)	46 (14.7)	84 (26.8)	78 (24.9)	105 (33.5)	313 (100)
11 - 20 (yrs)	11 ( 7.5)	24 (16.3)	37 (25.2)	75 (51.0)	147 (100)
21 - (yrs)	1 ( 2.1)	12 (25.5)	10 (21.3)	24 (51.1)	47 (100)
	58 (11.4)	120 (23.7)	125 (24.7)	204 (40.2)	507 (100)

DM : diabetes mellitus, VD : vessel disease. p value of linear by linear association <0.001

위험 인자 개수와 관상동맥 병변과의 관계(Table 11, 12)

1 4 5  
, 10, HbA<sub>1c</sub> 가 (p<0.001).  
7.5%, HDL - 40 mg/dL 5  
2 고 찰  
, 1 2 3  
4 5 3.0(1.7 5.4), 16.0(3.7  
70.0) (p<0.001). , 1  
2 4-8)(12)(13), 2  
3.7(2.1 6.7) (p<0.001). 가  
1 4 5 가  
, 2 3 AHA ADA Consensus De -





가 가 (12)(25)(26)

(12)(13) Framingham heart study

HbA<sub>1c</sub>

1 5

가 , HbA<sub>1c</sub>가

7.5%

가 7.5%

(p=0.020).

74 가 2.7

(11)(19-22)

11)

11.2 , 8.1

(p=0.001).

analysis , meta-

27)(28)

2

가

가

27)(29)

가

10

10

2.0 가

(p=0.030).

45 , 55

(62.7 : 59.7 , p=0.013)(93.

9 : 84.7% p=0.010)

가

Long - Term Intervention with Pravastatin in Is -  
chemic Disease(LIPID)

가 가

가 가

가 ,

5

30)

가 ,

가 ,

1 , 2

(12)(23) United Kingdom Prospective Diabetes  
Study( UKPDS) 33

가 , 10

, HbA<sub>1c</sub> 7.5% , HDL -

40 mg/dL 5

UKPDS 35

가 1%

21% , 14%,

14% (13)(24)

가

가

가 가

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