

급성심근경색증으로 발현한 변이형 협심증환자의 임상적, 관동맥 조영검사상 특성 및 장기추적관찰

두영철 · 김재삼 · 채경수 · 송관욱 · 홍경순 · 박대균 · 한규록
오동진 · 유규형 · 임종윤 · 고영박 · 이광학 · 이 영

Clinical and Angiographic Characteristics and Long-term Follow-up in Patients with Variant Angina Who Presented as Acute Myocardial Infarction

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ABSTRACT

Background and Objectives : There were numerous reports for clinical characteristics and prognosis of patients with variant angina (VA) but little information is available for patients with VA who presented as acute myocardial infarction (AMI). The purpose of this study is to determine the clinical and angiographic predictors for initial development of AMI in patients with VA and prognosis of patients with VA who presented as AMI. **Materials and Methods :** The study group comprised 166 patients with VA : forty one (25%) of whom presented as AMI (Group A ; Male 32, mean age 50 years) and 125 presented as typical VA or unstable angina (Group B ; Male 73, mean age 54 years). The diagnosis of VA was made by spontaneous spasm and ergonovine or acetylcholine (only Group B) provocation. **Results :** 1) Male gender (78% vs. 58%, $p<0.05$), smoking (74% vs. 53%, $p<0.05$), and disease duration (18 ± 5 vs. 7 ± 1 month, $p<0.0001$), and ST-segment elevation during chest pain (71% vs. 23%, $p<0.05$) were significantly higher in group A than in Group B. 2) Prevalence of fixed stenosis of 50% or greater was higher in Group A than in group B (12% vs. 2%, $p<0.05$) and the percent stenosis after nitroglycerin injection was also greater in group A than in group B (43 ± 5 vs. 28 ± 2 , $p<0.01$), but the disease activity such as frequency of resting angina, spontaneous spasm, and multivessel spasm were not different between two groups. 3) During clinical follow-up at a mean duration of 2.7 years, three patient (2%) in group B died of a cardiac cause. Non-fatal MI occurred 1 (2%) and 3 patients (2%) in group A and B, respectively. **Conclusions :** Our data show that male gender, smoking, duration of disease, ST-segment elevation during chest pain, and a fixed stenosis of 50% or greater are predictors for initial development of AMI in patients with VA. The prognosis in group A is excellent and this may be associated with less severe atherosclerotic disease and a high rate

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of medication with calcium channel blocker or nitrate compared with those in previous studies. (**Korean Circulation J 1999;29(3):276-284**)

KEY WORDS : Variant angina · Acute myocardial infarction · Clinical and angiographic characteristics · Prognosis.

서 론

재료 및 방법

대상환자
 1-4)
 6 가 166
 41
 (Group A ; 32 , 50)
 125
 (Group B ; 73 , 54)
 5)6)
 가 70%
 7-9)
 ergonovine
 (Erg)
 10-12)
 acetylcholine(Ach)
 가
 방 법
 13-16)
 가
 가 7 10 Group A
 가
 가
 3
 caffeine
 Erg 50, 100, 150 ug
 3
 3
 Ach 20, 50,
 100 ug 50, 100 ug 0.9%

5 cc 20
 . Ach 4
 2 가 200
 ug nitroglycerin
 Ach Ach 가
 75% 가
 trate
 ±
 unpaired t - test chi - square, Fisher's
 exact test p<0.05
 Q
 Q oneway ANOVA
 Scheffe's F test p<0.05
 결 과
 임상적 특성
 166 41
 54 , 60
 , 8 3
 (Group A)
 가 32 (78%)
 (Group B) 73 (58%) (p<0.05)
 Group A 30 (74%),
 Group B 66 (53%) (p<0.05) Gr -
 oup A (Table 1).
 154 (93%) Group A
 32 (78%) Group B 121 (97%)

Table 1. Clinical characteristics of subjects

	Group A (n = 41 patients)	Group B (n = 125 patients)
Sex (M/F)*	32/9	73/52
Age (year)	50 ± 1	54 ± 1
Clinical manifestaton		
Variant angina/UA		60 (48%)/54 (43%)
Rest pain	35 (85%)	114 (91%)
Effort pain	6 (15%)	34 (27%)
Pain related to alcohol	10 (31%)	39 (32%)
Frequency of pain (5/wk)	5 (12%)	32 (26%)
Risk factors		
Hypertension	6 (15%)	35 (28%)
Diabetes mellitus	7 (17%)	34 (27%)
Hyperlipidemia	7 (17%)	34 (27%)
Smoking*	30 (74%)	66 (53%)
Angina before admission†	32 (78%)	121 (97%)
Duration of disease (month) ‡	18 ± 5	7 ± 1
LV function (EF, %)	57 ± 2	59 ± 1
EF > 40%	37 (90%)	122 (98%)

AMI : acute myocardial infarction ; LV : Left ventricle ; EF : ejection fraction ; UA : unstable angina
 *p<0.0 ; †p<0.01 ; ‡p<0.001

Group B (p<0.01)
 Group A
 18(± 5) , Group B 7(± 1)
 Group A (p<0.0001)
 가 5 가 가
 Group A 5 (5/32 : 16%), Group B 32 (32/121 : 26%) (Table 1).

심전도 및 운동부하검사

ST T 가 가 Group A
 37 (90%), Group B 112 (90%) . ST
 29 (71%), 29 (23%) Group
 A (p<0.05)
 가 4 (10%), 13
 (10%) (Table 2).
 96 (58%)
 Group A 23 9 (39%) ,

Table 2. ECG changes during chest pain and treadmill test of subjects

	Group A (n = 41 patients)	Group B (n = 125 patients)
ECG changes during chest pain		
ST-segment elevation*	29 (71%)	29 (23%)
ST-segment depression	5 (12%)	13 (10%)
T wave inversion	1	19 (15%)
AV block	0	1
Ventricular tachycardia	1	1
No change	4 (10%)	13 (10%)
Treadmill test (premedication)	23	73
Positive on treadmill test	9 (39%)	22 (30%)
ST-segment elevation [†]	3 (33%)	0
ST-segment depression	6 (67%)	22 (100%)

ECG : electrocardiogram ; AMI : acute myocardial infarction ; AV : atrioventricular ; *p<0.05 ; [†]p<0.001

Group B 73 22 (30%)
 . 31 Group A 3
 (33%) ST Group B 26
 ST (p<0.001) (Table 2).

관동맥 조영검사 및 연속유발검사

가 Group A
 18 (44%), Group B 74 (59%)
 (<50%) Group A 18 (44%), Group B 48
 (38%) 50%
 5 (12%), 3 (2%) Group A
 (p<0.05) 50%
 . Nitroglycerin 가 Group
 A 43%, Group B 28% 가
 Group A (p<0.01) (Table 3).
 Group
 A 23 (56%), Group B 56 (45%)
 . Group A 11 (27%)
 Group B 24 (19%)
 (Table 3).

추적관찰 : 심혈관계사건 및 자연관해율

nitrate
 . Nitrate Group A 35 (85%),
 Group B 109 (87%) , Group A

Table 3. Angiographic characteristics and spasm provocation test of subjects

	Group A (n = 41 patients)	Group B (n = 125 patients)
Extents of CAD		
Normal	18 (44%)	74 (59%)
Near normal	18 (44%)	48 (38%)
Mild stenosis (50% & <70%)*	5 (12%)	3 (2%)
1-vessel disease	6 (15%)	9 (7%)
2-vessel disease	0	1
Diameter stenosis of lesion (%)		
Before NTG injection	80 ± 2	80 ± 1
After NTG [†]	43 ± 5	28 ± 2
Documentation of spasm		
Spontaneous coronary spasm	23 (56%)	56 (45%)
Provocation test		
Ergonovine	18 (44%)	27 (21%)
Acetylcholine		42 (34%)
E1 or ach1	7 (39%)	36 (52%)
Multivessel spasm	11 (2%)	24 (19%)
Artery involved in spasm		
LAD/RCA	28/18	60/76
Proximal	25	60

AMI : acute myocardial infarction ; CAD : coronary artery disease ; NTG : nitroglycerin ; E1 or Ach1 : ergonovine 50 ug or acetylcholine 20 ug ; LAD : left anterior descending artery ; RCA : right coronary artery ; *p<0.05 ; [†]p<0.01

36 (88%), Group B 114 (91%)
 .
 angiotensin converting enzyme(ACE) inhibitor
 Group A 10 (29%) 9 (7%)
 Group B (p<0.01)
 (Table 4).
 가
 가 Group A 3 (7%),
 Group B 11 (9%)
 (Table 4).
 32(6 120) Group B
 3 (2%) . 3
 2 1
 . Group A 100%,
 Group B 98% . (nonfatal
 myocardial infarction) 1 (2%), 3 (2%)

Table 4. Clinical follow-up of subjects

	Group A (n = 41 patients)	Group B (n = 125 patients)
Follow-up period (year)*	3.6 ± 0.4	2.3 ± 0.2
Cardiac complications		
Death (cardiac cause)	0	3 (2%)
Myocardial infarction	1 (2%)	3 (2%)
Syncope	0	3 (2%)
Medication		
Calcium channel blocker	36 (88%)	114 (91%)
Nitrate	35 (85%)	109 (87%)
Potassium channel	5 (12%)	26 (21%)
ACE-inhibitor*	10 (29%)	9 (7%)
Response to medication		
No sx without medication	3 (7%)	11 (9%)
No sx with medication	25 (61%)	54 (43%)
Sx without medication	2 (5%)	9 (7%)
Sx with medication	11 (27%)	51 (41%)

AMI : acute myocardial infarction ; Sx : symptom ;
No Sx without medication = spontaneous remission ;
Sx with medication = recurrent angina ; ACE : angio-
tensin converting enzyme ; *p<0.01

Group B 3 (2%)

(Table 4).

Group A : Q파 및 비Q파 심근경색증

41 Group A Q (QMI)
27 , Q (non - QMI) 14
가 QMI 24 (89%),
non - QMI 8 (57%, p<0.05),
가 23 (85%), 7 (50%, p<0.05),
ST 24 (89%), 5
(36 %, p<0.01) QMI
. Nitroglycerin QMI
20% Group B 11%(p<0.05)
. Non - QMI 50% non -
AMI (14% vs. 2%, p<0.05)
(Table 5).

고 안

Prinzmetal ¹⁷⁾

가 1 - 3)(18)(19)

가
10 - 12)

가

가

가

가

임상적 특성

가

가

가

가

20)(21)

10 14% 25%(41/166)

가

(

)

22 - 24)

가

25)

가

가

78%

97%

Table 5. Clinical and angiographic characteristics and cardiac events of patients with variant angina who were presented with AMI by Q-wave infarction

	Group A		Group B (n = 125)
	QMI (n = 27)	non-QMI (n = 14)	
Age (year)	49 ± 2	52 ± 2	54 ± 1
Sex (Male)	24 (89%)* [†]	8 (57%)	73 (58%)
Angina before admission	21 (78%) [‡]	12 (86%)	121 (97%)
Frequency of pain (5/wk)	4 (15%)	1 (7%)	32 (26%)
Duration of disease (month)	21 ± 6 [‡]	13 ± 21	7 ± 1
Smoking	23 (85%) ^{‡ †}	7 (50%)	66 (53%)
ECG changes during pain			
ST-segment elevation	24 (89%)* [§]	5 (36%)	29 (23%)
Extents of CAD			
Normal	12 (44%)	6 (43%)	74 (59%)
Mild (50% & <70%)	3 (11%)	2 (14%) [‡]	3 (2%)
Diameter stenosis (%)			
After NTG injection	20 ± 4 [‡]	18 ± 5	11 ± 1
ACE-inhibitor	9 (33%)*	1 (7%)	9 (7%)
Cardiac complications			
Death (cardiac cause)	0	0	3 (2%)
Myocardial infarction	0	1 (7%)	3 (2%)
Remission	2 (7%)	1 (7%)	11 (9%)

AMI : acute myocardial infarction ; QMI : q wave myocardial infarction ; CAD : coronary artery disease ; ECG : electrocardiogram ; NTG : nitroglycerin ; ACE : angiotensin converting enzyme ; *p<0.01 vs. Group B ; [†]p<0.05 vs. non-QMI patients ; [‡]p<0.05 vs. Group B ; [§]p<0.01 vs. non-QMI patients

관동맥조영검사 및 연속유발검사

Nakamura ²⁶⁾

가 , 가 75%
가 69%
33%
가 90% 15%(9/59)
75 90% 5%(2/42) 75%
2%(5/207)
가 ²⁰⁾
ST
71%(29/41), QMI 89%(24/27)
Park ²⁰⁾ 16%
(23/143)
ST 3 가
ST Severi¹³⁾ Walling ²⁷⁾
ST 43%(17/40),
21%(17/81) 70% 17%
가 (15/87)

Extent score, 가 1

(2%)

가

가

50% 12% 5%

(5/41) 2%(3/125) 90% 가

가

가(159/166) 40%

(Erg 50 ug or Ach 20 ug)

가

27%, 19%

가

가

가

추적관찰 1 2 45 56% 가

28-30) Bott Silverman 31) 15%

nitrate (9/59) 2

35% 75% 14 5 (36%)

가 Nakamura 26) 3.4

5%, 2%,

(Ventricualr tachycardia or Atrioventri -

cular block) 14%

Walling 27) 40%가 70%

가 5.4 20) 8% 가 Park

1 , 5 95%, 89% 1 , 8%(14/166)

5 83%, 69%

Park 20) 가

23%가 50%

1.5 2.4%(4/165)가

0.6%(1/165)가 , 1.2%

(2/165)

가

5%

50% 가 2.7

3 (2%)

4 (2.4%)

연구의 제한점

가

방 법 :

6

가

166

41

(Group A ; 32 , 50)

125

가 (Group B ; 73 , 54)

. Group A

가

Erg

Ach

결 과 :

가

ergonovine

가

acetylcholine

1) : Group A 가 32 (78%,
p<0.05), 30 (74%, p<0.05)
, 32 (78%, p<0.01)

Group B

2) : ST
Group A 29 (71%), Group B 29 (23%)
Group A (p<0.05)

가

가 96 Group A 39%
(9/23), Group B 30%(22/73)

ST Group A
3 (p<0.001).

요 약

3) :
50% group A 5 (12%),
Group B 3 (2%) nitroglycerin

연구 배경 :

가 Group A 43%, Group B 28%
(p<0.05) Group A

가

가

4)

:

가 Group A 3 (7%), Group B 11
(9%) 2.7 Group B
3 (2%)

1 (2%), 3 (2%)

5) 41 Group A Q (

QMI) 27 . QMI
(89% vs. 57%, p<0.05), (85% vs. 50%, p<0.05),
ST (89% vs. 36%, p<0.01)
(20% vs. 11%, p<0.05)

결 론 :

ST
50%
가
가
2.7
가
100%

가

중심 단어 :

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