

관상동맥 성형술 후 발생하는 비Q파 심근경색이 심장에 미치는 장기적 영향

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Impact on Long-term Adverse Cardiac Events of Troponin T or Creatine Kinase-MB Release after Percutaneous Transluminal Coronary Angioplasty

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ABSTRACT

Background and Objectives : The impact on long-term adverse cardiac events of troponin T (TnT) or creatine kinase-MB (CK-MB) release after percutaneous transluminal coronary angioplasty (PTCA) is not well defined. The purpose of the study is to evaluate the effect of elevated TnT or CK-MB on the late major adverse cardiac events [MACE ; Q wave myocardial infarction (MI), revascularization, or cardiac death]. **Subjects and Methods** : Study population were 207 consecutive patients (M : F = 148 : 59, mean 60.8 ± 9.2 years) who underwent PTCA. Patients with acute MI, unstable angina with abnormal levels of TnT or CK-MB, or newly developed Q MI after PTCA were excluded. Cardiac enzyme levels were measured before and 8, 24 hours after PTCA for CK-MB, and before and 16 hours after PTCA for TnT. Group I (n = 181, 87.4%) had normal levels of both after PTCA. Group II (n = 26, 12.6%) had abnormal levels of CK-MB (> 16 U/L) and/or TnT (> 0.2 ng/mL). 1-year follow-up was available in 201 (97.1%) patients. **Results** : Incidence of non-Q MI after PTCA was 26/207 (12.6%). Major complications such as acute coronary occlusion, side branch occlusion, and major dissection were significantly associated with elevation of TnT or CK-MB after PTCA (p = 0.01). However, elevation of CK-MB or TnT was not significantly associated with late MACE by Kaplan-Meier survival curve (p = 0.46). During 1-year follow-up, event free rate of group I and II were 76.6% and 69.2%, respectively. **Conclusion** : Acute coronary occlusion, side branch occlusion, or major dissection can increase the level of TnT or CK-MB after PTCA. But, elevation of CK-MB or TnT after PTCA dose not

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significantly influence on late MACE. (Korean Circulation J 2002;32(11):949-957)

KEY WORDS : Angioplasty, transluminal, percutaneous coronary ; Creatine kinase ; Myocardial infarction ; Troponin T.

서 론

207
(n = 181, 87.4%)
CK - MB troponin T가
(n = 26, 12.6%)
CK - MB troponin T가
Q
가
가
creatine kinase creatine kinase isoenzyme MB(CK - MB) troponin T troponin
가 Troponin CK CK - MB
CK - MB
Q
가
CK CK - MB
troponin T
Q
CK - MB
Q
Q
1
Q

대상 및 방법

대 상

가

가

Q

심근 효소의 측정 및 분석
CK - MB troponin T
CK - MB 8 , 24
immune inhibition(Johnson & Johnson Clinical Diagnostics, USA)
troponin T 16 enzyme-immunological test(Boehringer Mannheim Diagnostics, Germany) CK - MB 16 U/L , troponin T 0.2 ng/mL

심전도 검사 및 분석

12
24
2

관상동맥 조영술 및 성형술

Judkins , 가
A
AHA/ACC A
AHA/ACC
B C

TIMI(Thrombolysis in Myocardial Infarction) 0, 1, 2

(major dissection), (minor dissection),
 , 가 , ,
 NHLBI(National Heart, Lung
 and Blood Institute)
 B , C, D, E, F
 MI 3 TIMI 0 1

Table 1. Clinical demographics

	Group I	Group II	p
Number	181 (87.4%)	26 (12.6%)	
Age (years)	59.1 ± 9.5	64.3 ± 7.9	NS*
Male	131 (62.6%)	17 (65.4%)	NS
Risk factors			
Smoking	100 (55.2%)	16 (57.1%)	NS
Diabetes mellitus	41 (22.6%)	5 (17.8%)	NS
Hypertension	81 (44.7%)	18 (64.3%)	NS
Hyperlipidemia	51 (28.2%)	7 (25.0%)	NS

* : not significant

주적 관찰
 가 59 (28.5%), 가
 가 1 79 (38.2%), 가 69 (33.3%)
 , 1 가

(Table 1).

Q
 CK - MB가
 2 Q 가
 가
 1),
 .

관상동맥 성형술 후 비Q파 심근경색의 발생 빈도

Q 2
 28/209 (13.4%)
 Q 2
 207 Q 26 (12.6%)
 Q
 (26/28, 93%)

통 계 ± ,
 SPSS Chi - square
 test, Fisher 's exact test, Student 's t - test mu-
 ltivariate analysis ,
 Kaplan -
 Meier survival curve
 p 0.05

원인 인자에 따른 비Q파 심근경색 발생의 비교

진단 및 치료 방법에 따른 비Q파 심근경색 발생의 비교

79/207 (38.2%) 12 (15.2%),
 69/207 (33.2%) 8 (11.6%)

결 과
 대상 환자들의 임상적 특성
 207 / 148/59
 59.1 ± 9.5 , 64.3 ± 7.9

Q
 가 ,
 142/207 (68.6%) 17
 (11.0%) , 65/207
 (31.4%) 9 (13.8%) Q
 Q
 가 (Table 2).

Table 2. Incidence of newly developed non Q myocardial infarction (MI) after percutaneous transluminal coronary angioplasty in each characteristics*

	Total	Group I	Group II
Diagnosis			
Old MI	59 (28.5%)	53 (90.0%)	6 (10.0%)
Unstable angina	79 (38.2%)	67 (84.8%)	12 (15.2%)
Stable angina	69 (33.2%)	61 (88.4%)	8 (11.6%)
Treatment modality			
Balloon	142 (68.6%)	125 (89.0%)	17 (11.0%)
Stent	65 (31.4%)	56 (86.2%)	9 (13.8%)
Lesion			
Type A	101 (48.7%)	89 (88.1%)	12 (11.9%)
Irregular	61 (29.5%)	54 (89.0%)	7 (11.0%)
Total/subtotal	32 (15.4%)	26 (82.0%)	6 (18.0%)
Thrombus	10 (4.8%)	9 (90.0%)	1 (10.0%)
SVG	3 (1.5%)	3 (100%)	0 (0%)

* : no significant difference between each characteristics, SVG : saphenous vein graft

병변에 따른 비Q파 심근경색 발생의 비교

	A	Q
12 (11.9%),	61/207 (29.5%)	32/207 (15.4%)
7 (11.0%),	6 (18.0%),	10/209 (4.8%)
1 (10.0%)	3/207 (1.5%)	

합병증에 따른 비Q파 심근경색 발생의 비교

	가	Q
가 100/207 (48.3%)	가 (92/207, 44.4%)	가 (1.6% vs. 11.5% [p=0.02], 2.2% vs. 11.5% [p=0.04]).
Q	Q	

Table 3. Incidence of newly developed non Q myocardial infarction after percutaneous transluminal coronary angioplasty in each complication group

Complications	Group I	Group II	Odds ratio	p
No complication	92	8		0.04
Acute occlusion	3	3	7.74	0.02
Side br. occlusion	4	3	5.77	0.04
Thrombus	4	0	1.35	1.0
Minor dissection	68	10	1.04	1.0
Major dissection	12	2	1.17	0.69

(p=0.01).
Q
Q
(p=0.04)(Table 3).

CK-MB와 troponin T의 분포, 예민도 및 관상동맥 성형술 후 발생하는 비Q파 심근경색의 독립인자

	CK - MB	troponin T
Q	CK - MB 1~14 U/L(3 U/L), troponin T 0.01~0.19 ng/mL(0.04 ng/mL)	Q
troponin T	CK - MB 16~175 U/L, 0.20~2.72 ng/mL	26
가	troponin T가 11, CK - MB가 2, CK - MB가 13	Q
CK - MB	troponin T	50.0%(13/26), 92.3%(24/26) , troponin T가 CK - MB
Q	Q	(p=0.01)
		(p=0.03)

주적 관찰

	207	201
1 (Q	가	가)
1	1	

(24.4%) Q
 (30.8% vs. 23.4%, p=0.46).
 Q Q
 48/201 (23.8%)
 Q
 (30.8% vs. 22.8%, p=0.46).
 3
 45/48 (93.8%)
 1
 가 (event -

free rate) 152/201 (75.6%) Q
 (69.2% vs. 76.6%, p=0.46)
 (Table 4, Fig. 1).

고 찰

가 가
 가
 2가
 troponin CK - MB
 5)
 1)
 2)
 3)
 4)
 5)
 6)
 serum glutamate oxaloacetate tra-
 nsaminase(SGOT ; aspartate transaminase, AST)
 lactate dehydrogenase(LDH) LDH isoenzyme

Table 4. Incidence of late major adverse cardiac events (MACE) after percutaneous transluminal coronary angioplasty (PTCA) in group I and group II*

	Group I	Group II	Total
PTCA	37 (21.1%)	8 (30.8%)	45 (22.4%)
CABG	3 (1.7%)	0 (0.0%)	3 (1.5%)
MI	1 (0.5%)	0 (0.0%)	1 (0.5%)
Death	0 (0.0%)	0 (0.0%)	0 (0.0%)
MACE	41 (23.4%)	8 (30.8%)	49 (24.4%)
Event free rate	134 (76.6%)	18 (69.2%)	152 (75.6%)

* : no significant difference between group I and group II, CABG : coronary artery bypass graft, MI : myocardial infarction

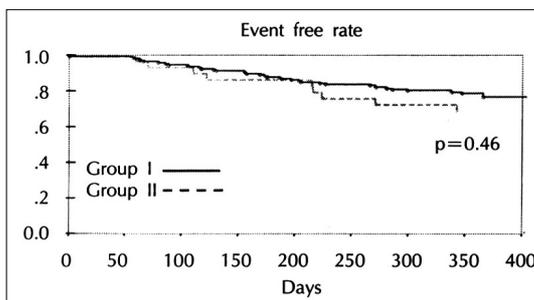


Fig. 1. Event free rate in group I and group II. During 1-year follow-up, event free rate of group I and II were 76.6% and 69.2%, respectively. Elevation of CK-MB or troponin T was not significantly associated with major adverse cardiac events (p = 0.46).

CK CK - MB, troponin T, troponin

CK-MB 및 troponin T의 특성

CK - MB 가
 3~8 가
 12~24 CK - MB 2~3
 100% 92%
 7) CK - MB가

가 8~20%

troponin CK - MB

troponin T가 CK - MB troponin T가 CK - MB

T (94%) 가 7 , 5

6%가 , 0.5%

troponin T가 가 CK - MB

troponin T가 troponin T가 Ravkilde ⁴⁾

2~3

2

troponin T 3~8 13% troponin T

가 12 ~2 troponin T

5~14 Troponin T 93% 100% ¹⁷⁾

troponin T en- CK - MB troponin T

zyme immunoassay 0.5% 28/209 (13.4%)

관상동맥 성형술 후 비Q파 심근경색의 진단 26/209(12.6%)

Q

Q

93%(26/28)

CK - MB troponin

가

CK - MB 2~5 비Q파 심근경색 발생의 관련 인자

가 troponin T

0.04 ng/mL 가 0.2 ng/mL ¹⁴⁾

CK - MB Q

CK - MB 가 Q

ponin T (16 IU/L) , tro- 가 가

0.2 ng/mL 가

()

CK - MB

Q
 chia ¹⁹⁾ 19 가 (11.0% vs. 16.0%). La Vec- 25 . Abdelmeguid ²⁴⁾ CK
 CK - MB 36
 가 (37% vs. 14%), CK - MB MB가 가 가 (p=0.03,
 (p=0.004). , 가 p=0.02), CK - MB가
 가 (p=0.11, p=0.05).
 가 (, ,) CK -
 MB가 가 가 (p
 =0.009).
 Q 가 가
 .²⁰⁾²¹⁾ 가 CK - MB 6
 CK - MB 3
 . Abbas ¹⁶⁾ 110 가 6 가 Bertinchant ²⁶⁾ CK - MB,
 (p<0.0001) (p<0.01) troponin T troponin
 (p<0.05), 가 (p<0.01)가 11 , , ,
 troponin T troponin T
 가 Fuchs ²⁷⁾
 troponin 가 0.45 ng/mL
 가 ,
 가 , Q ,
 가 CK - MB troponin T가 8 0.45 ng/mL
 가 (p=0.3). CK -
 MB troponin T troponin
 T (p=0.625).
 Q (p=0.01), (p=0.02), 가 (p=0.04) CK - MB CK CK - MB
 troponin T가 가 troponin T troponin
 (p=0.04).

관상동맥 성형술 후 발생하는 비Q파 심근경색이 장기적으로 심장의 부정적 결과에 미치는 영향

Q , Q

troponin T troponin
가 .

요 약

배경 및 목적 :
8~20%
Q

가
Q

가
Q

Q

방 법 :

가 가
Q

207
CK - MB troponin T
CK - MB
8 , 24 , troponin T
16
(n = 181, 87.4%) CK - MB
troponin T가
(n = 26, 12.6%) CK - MB
troponin T가 (CK - MB16
U/L, troponin T 0.2 ng/mL) . 1
(Q , ,)

결 과 :

207 26 (12.6%) Q
가 , Q
(p = 0.01).
Q

(p = 0.03) (p
= 0.01) . 1 Q Kaplan -
Meier survival curve
가 (p = 0.46).
가
(event - free rate) Q
69.2% 76.6% .

결 론 :

가
Q

Q

중심 단어 : ; ;
; T.

감사문 _____

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