

심부전 환자의 중증도의 지표로서 Cardiac Troponin I의 임상적 유용성

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The Clinical Usefulness of Cardiac Troponin I as a Marker for Severity in Patients with Congestive Heart Failure

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ABSTRACT

Background and Objectives : Spontaneous progression of severe congestive heart failure is structurally characterized by cellular degeneration and multiple foci of myocardial cell death. The cardiac troponin I (cTnI), one of the subunits of the troponin regulatory complex, binds to actin and inhibits interaction between actin and myosin. cTnI is uniquely expressed in the adult human myocardium, and an increase in its circulating levels is highly indicative of myocardial injury. In this study, we addressed the usefulness of cTnI as a sensitive and specific molecular marker for severity in patients with congestive heart failure. **Methods :** cTnI, creatinin kinase-MB (CK-MB), and myoglobin were assessed in 59 patients with severe congestive heart failure diagnosed by the echocardiography and gated equilibrium blood pool heart scan. Also we assessed cTnI, creatinin kinase-MB (CK-MB), and myoglobin in 25 persons without cardiac disease in echocardiography. **Results :** 1) The cTnI concentration was 89.6 ± 69.3 pg/mL in patients with congestive heart failure and its level was greater than that of the control group (22.4 ± 17.1 , $p = 0.001$). 2) The cTnI level differed significantly according to left ventricular ejection fraction (EF), 117.3 ± 73.8 pg/mL in patients with EF <40% (28 patients), 66.3 ± 44.5 pg/mL in patients with EF ≥ 40% (31 patients), 22.4 ± 17.1 pg/mL in the control group (25 persons) ($p = 0.001$). **Conclusion :** cTnI was useful as a specific and sensitive serum molecular marker in patients of congestive heart failure. And its level reflected the severity of congestive heart failure. (**Korean Circulation J 2000;30(6):724-728**)

KEY WORDS : Cardiac troponin I (cTnI) · Congestive heart failure.

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cTnI, CK-MB, MG의 측정과 좌심실 박출계수(EF)의 측정

서 론

troponin I Troponin T, I, C
troponin I(cTnI) troponin I isoform
Troponin T, I, C
, cardiac troponin

cTnI가
가
(sarcoplasm)
cTnI 5%가
cTnI가
myofibrilolysis
가
가

대상 및 방법

대 상
NYHA Class III IV
59
34 , 25 60.7 ±
14.1 (16 78) 6
digoxin, diuretics, ACE
inhibitors, oral nitrates, amiodarone
, 6
1
25 12
, 13 , 60.1 ± 9.7 (42
77)

cTnI
100 pg/mL
cTnI
가
cTnI, CK - MB, MG
cTnI
Beckman Access Immunoassay System(Be -
ckman, USA) (chemilu -
minescent immunoassay)
TnI 30 50,000 pg/ml
cTnI
가 slow
skeletal troponin I
cTnI 100 pg/mL
CK - MB ELISA
5 ng/mL MG ELISA
90 ng/mL,
76 ng/mL
(Gated blood pool heart scan)
ADAC - camera vertex
dual detector , 58%
59 25 cTnI, CK -
MB, MG
가 40%
cTnI, CK - MB,
MG
통계적 방법
±
cTnI, CK - MB, MG
T - test 가 40%
40%
ANOVA test

결 과

대상 환자들의 임상적 특징

59 ,

31 (52.5%) 28 (47.5%) . NYHA Class III 30 (50.8%) , Class IV 29 (49.2%)

40.8 ± 10.5% (Table 1).

Table 1. Clinical characteristics of congestive heart failure

Characteristics	
No.	59
Age (years)	60.7 ± 14.1
Sex, male/female	34/25
Cause of disease, n (%)	
Ischemic cardiomyopathy	31 (52.5)
Idiopathic cardiomyopathy	28 (47.5)
NYHA, n (%)	
Class III	30 (50.8)
Class IV	29 (49.2)
Left ventricular ejection fraction	40.8 ± 14.5
Ischemic cardiomyopathy	44.6 ± 12.1
Idiopathic cardiomyopathy	37.4 ± 8.4
Medication at inclusion, n (%)	
ACE inhibitors	9 (100)
Diuretics	59 (100)
Digoxin	32 (54.2)
Long-acting nitrates	12 (20.3)
Amiodarone	4 (6.8)

Table 2. Biochemical markers in patients with heart failure and control group

	Patient (n=59)	Control (n=25)	p value
cTnI (pg/ml)	89.6 ± 69.3	22.4 ± 17.1	<0.05
CK-MB (ng/mL)	2.12 ± 1.02	2.04 ± 0.88	NS
MG (ng/mL)	31.4 ± 32.9	31.9 ± 24.0	NS

cTnI : cardiac troponin I, CK-MB : creatinin kinase-MB, MG : myoglobin

Table 3. Biochemical markers in patients with heart failure, EF<40% (Group A), EF ≥ 40% (Group B) and control (Group C)

	Group A (n = 28)	Group B (n = 31)	Group C (n = 25)	p value
cTnI (pg/ml)	117.3 ± 73.8	66.3 ± 44.5	22.4 ± 17.1	<0.05
CK-MB (ng/mL)	2.25 ± 1.12	2.14 ± 0.91	2.04 ± 0.88	NS
MG (ng/mL)	37.1 ± 35.2	27.5 ± 28.4	31.9 ± 24.0	NS

cTnI : cardiac troponin I, CK-MB : creatinin kinase-MB, MG : myoglobin

심근 효소치

59 cTnI 89.6 ± 69.3 pg/mL, CK - MB 2.12 ± 1.02 ng/mL, MG 31.4 ± 32.9 ng/mL 25 cTnI 22.4 ± 17.1 pg/mL, CK - MG 2.04 ± 0.88 ng/mL, MG 31.9 ± 24.0 ng/mL cTnI p value 0.001 가 , CK - MB MG 가 (Table 2).

심부전의 중증도와 심근 효소치의 관련성

가 40%

가

가 cTnI가 (p=0.005), CK - MB, MG (Table 3).

고 안

,

가 .

가 가 가 (oxidative stress)

cytokine .

11 - 13)

Troponin I Troponin T,I,C troponin , isoform slow skeletal, fast skeletal, cardiac muscle - specific isoform , 14 - 16) slow skeletal troponin I(ssTnI) cardiac troponin I(cTnI) 가 가 17) troponin isoform

가 cTnI , TnI , cTnI , NYHA Class III IV cTnI ,

ssTnI cTnI 가 , 가 가

¹⁷⁾¹⁸⁾ cTnI , 가

24 - kD isoform 31 가

가 amino - terminal residues ,

40% 가

cTnI actin 가

actin myosin ³⁾⁴⁾ cTnI가

cTnI 가

가

⁵⁻⁷⁾ MG, CK, CK - MB, LD1/LD2 .

가

CK - MB cut - off line 가 , cTnI

⁶⁾⁸⁾⁹⁾ ,

²¹⁾ 가

가 monoclonal anti - cTnI cTnI

body 가 ^{22 - 24)} cTnI

cTnI ²⁴⁾ ²⁶⁾

요 약

서 론 :

가 pg/mL . cTnI가 . Cardiac

troponin I(cTnI) troponin

(sarcoplasm) cTnI

5%가 , cTnI

cTnI가 ⁸⁾⁹⁾ 가

cTnI가 cTnI가

가

가

대상 및 방법 :

가 NYHA Class III

²⁷⁾ 59

cTnI CK - MB, MG 25

cTnI, CK - MB, MG

결 과 :

1) cTnI

89.6 ± 69.3 pg/mL, 22.4 ± 17.1 pg/mL
(p=0.001).

2) 가 40% 31

cTnI가 66.3 ± 44.5 pg/mL, 40% 28

cTnI가 117.3 ± 73.8 pg/mL
(p=0.001).

3) CK - MB, MG

가

결 론 :

cTnI

가

중심 단어 : Cardiac troponin I

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