



cardiac troponin I

Abstract

Primary Survey of Cardiac Troponin I Elevated Groups in Trauma Patients

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Background: Cardiac troponin I (cTnI) is a sensitive cardiac marker of myocardial injury. In normal coronary angiogram, positive cTnI values may be detected in various events such as sepsis, stroke, trauma and so on. To investigate characteristics of cTnI positive group in trauma patients, we designed this study between cTnI positive group and cTnI negative group.

Method: Trauma patients who visited emergency room within 24 hours after accidents were included. Patients who had renal failure, acute coronary syndrome, sepsis, spontaneous SAH were excluded. Retrospective study of 97 trauma patients was done. We investigated ISS (injury severity score), positive cTnI, EKG abnormality, shock class, ICU admission rate and mortality.

Result: In comparing with non chest trauma group, chest trauma group, whose chest AIS (Abbreviated Injury Score) is more than 3 point, had significant values in ISS, positive cTnI, EKG abnormality, shock class and ICU admission rate. Also, in non chest trauma group, we found several patients whose cTnI level was positive. When non chest trauma group was divided into two subgroups, the mortality and shock class of positive cTnI group were higher than that of negative cTnI group. When all trauma patients were divided into two groups, a positive cTnI group had higher values in ISS, shock class, ICU admission rate and mortality than that in a negative cTnI group.

Conclusion: We found that cTnI were positive in patients of cardiac contusion but also in various trauma cases. In non chest trauma patients, we assumed that hypotension caused cTnI elevating. The cTnI could play a role in predicting prognosis in trauma patients.

Key Words: Cardiac troponin I (cTnI), Trauma, Cardiac contusion, Prognosis

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: 2005 6 23 , : 2005 7 18 , : 2005 8 8

* 2005 20

Troponin (striated muscle) (contraction-regulating protein complex), troponin I (inhibitory subunit), troponin C (calcium-binding subunit), troponin T (tropomyosin binding subunit), cardiac troponin I (cTnI), CK-MB (creatinine kinase isoenzyme MB), (cardioversion), (cardiac contusion), (2-4).

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cTnI, ISS (Injury Severity Score), cTnI, cTnI 1.5 ug/L, ACS (American College of Surgeon) Class ~ (Table 1).

Table 1. EKG abnormalities that could be suspicious as a cardiac contusion

Myocardial injury
new Q wave
ST-T segment elevation or depression
Conduction disturbance
right bundle branch block
fascicular block
AV nodal conduction block
First degree
Second degree
Third degree
Arrhythmia
sinus tachycardia
premature beats
atrial fibrillation
ventricular tachycardia
ventricular fibrillation
sinus bradycardia
atrial tachycardia

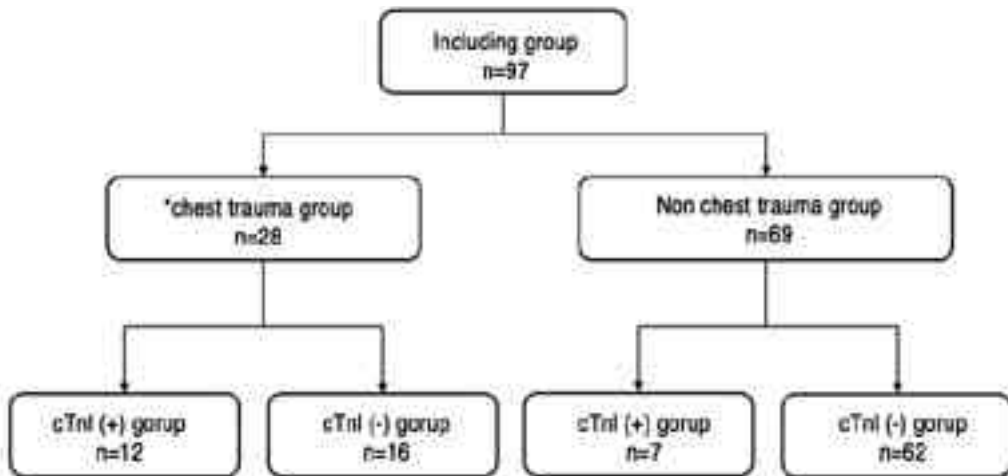


Fig. 1. Study design.

* chest trauma group ; chest AIS 3

3 AIS (Abbreviated Injury Score)가 3 이상인 경우, cTnI (Fig. 1). SPSS 11.5.0, p value < 0.05

10% cTnI

Table 3, ISS

97, 53.4±

21.2, 가 68 (70.1%) AIS가 3 이상인 경우, AIS가 3 이상인 경우 (serious ~ unsurvivable), 3 (minor ~ moderate) 가 (Table 2), ISS, cTnI

Table 2. Characteristics between chest trauma group and non chest trauma group

	chest trauma group (n=28)	non chest trauma group (n=69)	p value
Age (yrs)	48.3 ± 19.8	55.4 ± 21.5	NS*
Sex (male)	20 (71.4%)	48 (69.6%)	NS
ISS	22.8 ± 8.3	11.6 ± 6.2	< .001
cTnI positive rate	12 (42.9%)	7 (10.1%)	< .001
cTnI half life (days)	0.7 ± 0.9	0.2 ± 0.7	.014
EKG abnormalities	16 (57.1%)	24 (34.8%)	.043
Shock class	2.0 ± 1.2	1.4 ± 0.8	.025
ICU admission	18 (64.3%)	24 (34.8%)	.008
ICU duration (day)	6.5 ± 9.5	3.4 ± 7.1	NS
Mortality	2 (7.1%)	4 (5.8%)	NS

* no significance

Table 3. Characteristics between cTnI positive group and negative group in chest trauma group

	cTnI positive group (n=12)	cTnI negative group (n=16)	p value
Age (yrs)	42.5 ± 22.2	52.7 ± 17.1	NS*
Sex (male)	10 (83.3%)	10 (62.6%)	NS
ISS	23.8 ± 8.5	22.0 ± 8.4	NS
EKG abnormalities	10 (83.3%)	6 (37.5%)	.015
Shock class	2.4 ± 1.3	1.6 ± 1.0	NS
ICU admission	8 (66.7%)	10 (62.5%)	NS
ICU duration (day)	10.1 ± 12.1	3.8 ± 6.0	NS
Mortality	1 (8.3%)	1 (6.3%)	NS

* no significance

가 (5,6). (cardiac contusion) cTnI (supply-type ischemia) cTnI cTnI troponin (Table 5), cTnI ISS, (unbound cytosolic pool) cTnI 1.6±0.2 (7). Edouard cTnI 7 10 cTnI (8). cTnI CK-MB , Edouard cTnI (endocardial blood flow) (subendocardial hemorrhage)

Table 4. Characteristics between cTnI positive group and negative group in non chest trauma group

	cTnI positive group (n=7)	cTnI negative group (n=62)	p value
Age (yrs)	50.9 ± 17.8	56.0 ± 21.9	NS*
Sex (male)	6 (85.7%)	42 (67.7%)	NS
ISS	13.0 ± 5.6	11.4 ± 6.3	NS
EKG abnormalities	4 (57.1%)	20 (32.3%)	NS
Shock class	2.7 ± 1.3	1.3 ± 0.5	< .001
ICU admission	6 (85.7%)	18 (29.0%)	.006
ICU duration	3.3 ± 4.0	3.4 ± 7.4	.032
Mortality	3 (42.9%)	1 (1.6%)	.003

* no significance

Table 5. Characteristics between cTnI positive group and negative group

	cTnI positive group (n=19)	cTnI negative group (n=78)	p value
Age (yrs)	45.6 ± 20.6	55.3 ± 21.0	NS*
Sex (male)	16 (84.2%)	52 (66.7%)	NS
ISS	19.8 ± 9.1	13.6 ± 8.0	.004
Chest trauma [§]	12 (63.2%)	16 (20.5%)	< .001
EKG abnormalities	14 (41.2%)	26 (33.3%)	< .001
Shock class	2.5 ± 1.3	1.3 ± 0.6	< .001
ICU admission	14 (73.7%)	28 (35.9%)	.003
Mortality	4 (21.1%)	2 (2.6%)	.013

* no significance

[§]chest AIS 3

marker가 (protein

cTnI

, ACS

가

가

(supply type ischemia)

cTnI

(9).

(cardiac contusion) (gold standard)

(gold

(blunt chest trauma)

가

3 ~ 56%

(perfusion defect)

29 ~ 56%

, CK-MB

(transmural and non trans-

19%,

mural defect)

3 ~ 26%,

27 ~ 56%,

tro-

ponin I

T

15 ~ 24%

(2).

troponin

troponin

(10).

cTnI

16%

cTnI

cTnI

cTnI

cTnI

, cTnI

cTnI

cTnI

troponin T

troponin I 가

troponin

cTnI

(4).

(diagnostic window time)

가

가

가

가

4 ~ 6

가

가

(2,11).

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