

## 조기 급성 심근 경색증 환자에서 좌심실 이완기 심기능에 관한 연구\*

- 심근 경색 부위 및 단일 또는 다혈관 질환, 치료 방법 사이의  
비교 연구를 중심으로 -

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= Abstract =

### A Study for Diastolic Functions in Patients with Early Acute Myocardial Infarction

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**Background :** Doppler echocardiography is a non-invasive technique that has been used to evaluate LV diastolic dysfunction. Impaired left ventricular diastolic filling is known to occur in patients with coronary artery disease. Compared with those in normal subjects, Doppler-derived transmitral blood flow velocities have been reported to be reduced during early diastolic filling and to be compensatory elevated subsequent to atrial systole in patients with coronary artery disease. But stiffness of myocardium normalize the E/A ratio, and normal E/A ratio may reveal increased ventricular filling pressure. We tried to investigate left ventricular filling parameters by Doppler echocardiography in patients with early myocardial infarction, and to compare left ventricular diastolic function regarding infarct location on EKG, one or multi vessel disease on coronary angiography, and treatment modality.

**Methods :** From September 1993 to August 1995, Pulsed wave Doppler echocardiography was performed in patients with early acute myocardial infarction(N = 95) and control group(N = 20) within 5 days after admission, and parameters of diastolic function was evaluated.

**Results :** Echocardiographic data showed significant differences in mean ejection fraction, mean left ventricular mass, and mean left ventricular mass index between two groups. There was no significant difference in E/A ratio, deceleration time, and isovolumetric relaxation time between two groups. Neither, there was significant difference in each diastolic parameter for infarct related wall on EKG. And there was no significant difference in deceleration time for one or multi vessel disease on coronary angiography, treatment modality (conservative treatment, thrombolytic therapy, or primary PTCA).

**Conclusion :** In patients with early acute myocardial infarction, left ventricular diastolic dysfunc-

tion was absent. And there was no significant correlation between the presence of diastolic dysfunction and the location of infarct related wall on EKG, or one or multi vessel disease, or treatment modality.

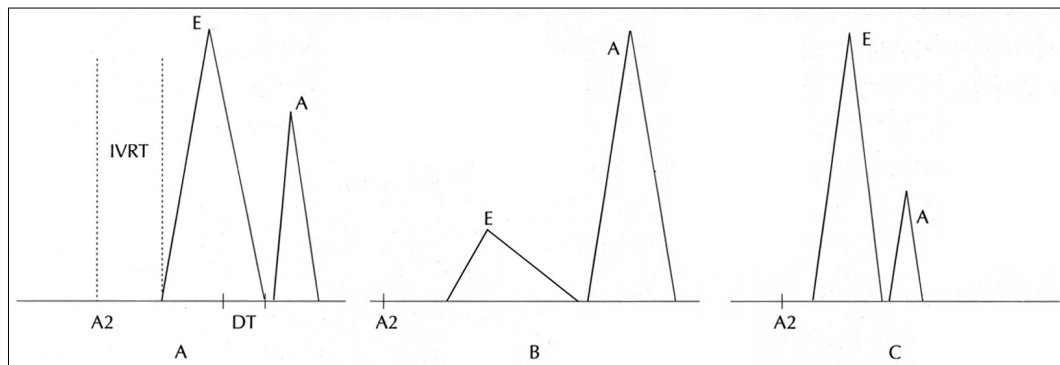
**KEY WORDS** : Acute MI · Diastolic dysfunction · Doppler.

## 서 론

Q 가 3가 2가 3  
가  
(early filling) (E)  
(atrial contraction, A) (E/A)가 1  
(deceleration time) 240msec 가  
(isovolumetric relaxation time, 20  
IVRT) 110msec  
Killip class I IV  
12  
1,2)  
가 3-6)  
(stiffness) E/A  
E/A 가  
7)  
(isovolumetric relaxation time, IVRT),  
(Peak flow velocity during early filling, E), (deceleration  
time, DT), (Peak  
flow velocity during atrial contraction, A), E/A  
2 aortic  
component

## 대상 및 방법

1993 9 1995 8  
5  
95 , 3 5cycle  
20 (Fig. 1 - A).  
Seldinger  
Judkins  
20 , 2) creatine kinase  
(CK) creatine kinase MB isoenzyme(CK - MB),  
SG - OT, lactate dehydrogenase(LDH)  
, 3) ST T



**Fig. 1.** Diastolic filling patterns and parameters. A : normal, B : abnormal relaxation, C : restrictive physiology.

(thrombolytic therapy) 가 95  
71 74% . uroki -  
nase 가 47 , tPA 가 24  
. Primary PTCA 가 4 (4.2%)  
, 20 (21.1%)  
SPSS PC<sup>+</sup>  
± t -  
test chi - squire test p p  
0.05

## 결 과

### 1. 대상 환자들의 특성

95 70  
(74%), 25 (26%), 58 ± 11  
. 12 ± 5 . 20  
15 (75%), 5 (15%) ,  
56 ± 7 .  
Killip class I  
IV I 48 (50.5%), II 39  
(41.1%), III 3 (3.1%), IV 5 (5.1%) .  
, 26  
(28%), 25 (27%), 22 (23%),  
8 (8%), 7 (7%), 1 (1%),  
1 (1%), Q 5 (5%) (Table 1).

**Table 1.** Patients characteristics

Killip class		48 (50.5%)
		39 (41.1%)
		3 ( 3.1%)
		5 ( 5.3%)
Infarct location	Inferior	26 (28%)
	Anterior	25 (27%)
	Anterolateral	22 (23%)
	Inferoposterior	8 ( 8%)
	Lateral	7 ( 7%)
	Inferolateral	1 ( 1%)
	Anteroinferior	1 ( 1%)
	Non-Q	5 ( 5%)

**Table 2.** The coronary angiographic findings

Coronary angiography	yes 74 (77.9%)
	no 21 (22.1%)
Mean ejection fraction	47.0 ± 8.2%
Lesion	normal 4
	1 vessel disease 48
	2 vessel disease 17
	3 vessel disease 5

### 2. 관상 동맥 조영술(Coronary angiography)

74 (77.9%) .  
47.0 ±  
8.2% , 가 4 ,  
48 , 17 ,  
5 (Table 2).

### 3. 이차원적(Two-dimensional) 및 도플러 심초음파 유형

	108	
$\pm 17\text{mmHg}$ (	$126 \pm 17\text{mmHg}$ )	
	$49 \pm 11\%$ (	$60 \pm 7\%$ )
	$223 \pm 72\text{g}$ (	$169 \pm 30\text{g}$ )
	$131 \pm 39\text{g/m}^2$ (	$99 \pm 18\text{g/m}^2$ )
	$4.0 \pm 1.3\text{l/min}$ (	$4.0 \pm 1.0\text{l/min}$ )
$\text{m}^2$ (	$2.4 \pm 0.6\text{ l/min/m}^2$ )	$E$
$\text{m/sec}$ (	$0.75 \pm 0.15\text{m/sec}$ )	$A$
$0.20\text{m/sec}$ (	$0.56 \pm 0.18\text{m/sec}$ )	$E/A$
$\pm 0.53$ (	$1.41 \pm 0.47$ )	(DT)
$\pm 38.5\text{msec}$ (	$206.1 \pm 19.3\text{msec}$ )	
(IVRT)	$106.4 \pm 23.9\text{msec}$ (	$98.6 \pm 10.5\text{msec}$ )

**Table 3.** Two-dimensional and Doppler echocardiographic data

	Acute MI	Control	
HR(/min)	$75 \pm 13$	$68 \pm 14$	NS
Systolic BP(mmHg)	$108 \pm 17$	$126 \pm 17$	$p < 0.05$
EF(%)	$49 \pm 11$	$60 \pm 7$	$p < 0.05$
LV mass(g)	$223 \pm 72$	$169 \pm 30$	$p < 0.05$
LV mass index ( $\text{g/m}^2$ )	$131 \pm 39$	$99 \pm 18$	$p < 0.05$
Cardiac output (L/min)	$4.0 \pm 1.3$	$4.0 \pm 1.0$	NS
Cardiac index ( $\text{L/min/m}^2$ )	$2.4 \pm 0.8$	$2.4 \pm 0.6$	NS
E velocity(m/sec)	$0.71 \pm 0.24$	$0.73 \pm 0.15$	NS
A velocity(m/sec)	$0.66 \pm 0.20$	$0.56 \pm 0.18$	NS
E/A	$1.13 \pm 0.53$	$1.41 \pm 0.47$	NS
DT(msec)	$208.5 \pm 38.5$	$206.1 \pm 19.3$	NS
IVRT(msec)	$106.4 \pm 23.9$	$98.6 \pm 10.5$	NS

\*Values are mean  $\pm$  SD. \*NS : non-significant

**Table 4.** Comparisons of diastolic functions regarding infarct related wall on EKG

	No	Age(years)	EF(%)	E/A	DT(msec)	IVRT(msec)
Ant	25	$59 \pm 13$	$46 \pm 11$	$1.25 \pm 0.6$	$202 \pm 34$	$106 \pm 29$
Antlat	22	$57 \pm 9$	$47 \pm 9$	$1.13 \pm 0.7$	$207 \pm 36$	$109 \pm 22$
Inf	26	$62 \pm 7$	$50 \pm 9$	$1.12 \pm 0.4$	$213 \pm 35$	$104 \pm 22$
Infpost	8	$57 \pm 14$	$57 \pm 14$	$1.13 \pm 0.4$	$210 \pm 43$	$102 \pm 15$
Lat	7	$47 \pm 10$	$52 \pm 13$	$1.07 \pm 0.4$	$208 \pm 59$	$100 \pm 17$

\*Values are mean  $\pm$  SD.

\*Ant : anterior, Antlat : anterolateral, Inf : inferior, Infpost : inferoposterior, Lat : lateral

, p  
0.05

E/A , ,  
(Table 3).

### 4. 심전도상의 심근 경색의 위치에 따른 좌심실의 이완기 기능의 비교

(Table 4).

### 5. 심혈관 조영술상 단일 혈관 질환, 다혈관 질환에 따른 좌심실 이완기 기능의 비교

$221.8 \pm 39\text{msec}$ ,  $203.7 \pm 34\text{msec}$ ,  
 $220.0 \pm 25\text{msec}$   
 $220.0 \pm 33$

**Table 5.** Comparisons of diastolic functions for one or multivessel disease on coronary angiography

	No	Deceleration time(msec)
Normal	48	$221.8 \pm 39$
One vessel disease	17	$203.7 \pm 34$
Two vessel disease	5	$220.0 \pm 25$
Three vessel disease	4	$220.0 \pm 33$

\*Values are mean  $\pm$  SD.

**Table 6.** Comparisons of diastolic functions for treatment modality

	No	Deceleration time(msec)
Thrombolytic therapy	65	$215.5 \pm 35$
Conservative treatment	18	$186.1 \pm 42$
Primary PTCA	4	$195.0 \pm 37$

\*Values are mean  $\pm$  SD.

msec 가 Doppler  
(Table 5).

#### 6. 혈전 용해제 치료 여부 및 primary PTCA 에 따른 좌심실 이완기 기능의 비교

186.1 ± 42msec,  
215.5 ± 35msec, primary PTCA  
195.0 ± 37msec  
primary PTCA 가  
p 0.18, 0.33  
(Table 6).  
Wind 가  
24  
20). 가  
(myocardial stiffness) 가  
(restrictive physiology)

고 찰 가  
가

<sup>21)</sup> (Fig. 1 - C).

가  
8).  
가 가  
가 가  
가 가  
9 - 11),  
12 - 15),  
1 - 6)  
16)  
22,23).  
가 <sup>24)</sup> (pseudonormali -  
zation).  
(impaired early diastolic filling),  
(peak early diastolic flow vel -  
ocity) ,  
(prolonged slo -  
pe decent)  
(late diastolic peak)가 가  
가 가  
(Fig. 1 - B).

가 <sup>17)</sup>,  
가  
가  
가  
가  
E/A 가  
<sup>26)</sup>  
가  
가  
27,28).  
(balloon infl -  
ation) 15  
가

가<sup>29)</sup>.

Vissner E/A Killip class

30).

Oh

가  
가

E/A 가 가

E/A  
가

, Killip class I

47

Killip class II IV 15

E/A

31).

wall mot -

ion score index

방 법 :

1993 9 1995 8

가

5

wall motion

95

score index

20

결 과 :

31).

p

0.05

E/A ,

가

primary

PTCA

요 약

결 론 :

연구배경 :

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