

## 특발성 확장성 심근증에서 치사성 부정맥 발생의 예측인자에 관한 연구

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### Predictors of Arrhythmic Events in Idiopathic Dilated Cardiomyopathy

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#### ABSTRACT

**Background and Objectives :** Previous studies have indicated that idiopathic dilated cardiomyopathy (IDCM) is associated with a high incidence of lethal ventricular arrhythmia and sudden cardiac death (due to arrhythmic events). The objective of this study was to evaluate predictive factors of arrhythmic events in IDCM. **Subjects and Methods :** A total of 174 patients with IDCM were evaluated for the measurement of multiple parameters such as PR interval, QRS duration, rate corrected QT dispersion, bundle branch block, atrial fibrillation, left ventricular end diastolic dimension, ejection fraction, left atrial size, and left ventricular hypertrophy. The patients were divided into 2 groups : group A with and group B without arrhythmic events. **Results :** Over an observation period of  $38 \pm 19$  months, arrhythmic events developed in 39 of the 174 patients (4 VT, 1 VF and 34 sudden cardiac death, 22.4%). In multivariate analysis, only QTdC was found to be an independent predictor of arrhythmic events (RR : 1.03, 95% CI : 1.01 - 1.04,  $p < 0.01$ ). The positive and negative predictive values of arrhythmic events in patients with QTdC  $> 108$  ms were 43.8% (7/16) and 85.6% (83/97) respectively. The positive predictive value of arrhythmic events in patients with QTdC  $> 108$  ms and EF  $< 28\%$  was 66.6% (8/12). **Conclusion :** The extent of repolarization dispersion and LV systolic function was determined to have value as a useful screening test for the prediction of arrhythmic events in IDCM. (**Korean Circulation J 2001; 31(12):1290-1296**)

**KEY WORDS :** Cardiomyopathy, congestive ; Tachycardia, ventricular ; Ventricular fibrillation ; Death, sudden, cardiac.

서 론

yopathy, IDCM)

가

가

(idiopathic dilated cardiom -

IDCM

12%가

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: , 442 - 721

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28% QTDC (left ventricular hypertrophy, LVH) (left ventricular end diastolic dimension, EDD), (ejection fraction, EF), (left atrial size, LA)가

<sup>1)</sup> IDCM (implantable cardioverter defibrillator, ICD) <sup>2)</sup> <sup>3)</sup> 12 mm IDC 38 ± 19 (sustained ventricular tachycardia, VT), (ventricular fibrillation, VF) (sudden cardiac death, SCD)가

IDCM QT dispersion,<sup>4-6)</sup> T wave alternance,<sup>7)8)</sup> RR variations,<sup>4)9)</sup> signal average electrocardiogram(SA-ECG),<sup>10)11)</sup> (electrophysiologic study, EPS)<sup>12)13)</sup> 가 A B

가 1 가

IDCM 12 가 , , ,

통계분석 ± student t - test 가 Chi - square test

대상 및 방법

대 상 1994 6 1999 12 multivariate Cox regression analysis

IDCM IDCM Thallium scan best cut - off Receiver Operating Characteristic curve

, class I III SPSS for Windows version 8.0(SPSS Inc. Chicago) MedCal(Frank Schoonjans, Mariakerke, Belgium) packages p 0.05

NYHA class IV 176 가

방 법 25 mm PR (PR), QRS (QRS), (bundle branch block, BBB), rate corrected QT dispersion(QTDC) QT 12 CCU 3

5 TP isoelectric baseline QRS complex T 1 , 2

Bazett's (QTc) =QT R-R ( ) QTc 1

1) , NYHA cl -  
ass  
가 (Table 1).  
2) PR, QRS, BBB, AF, LVH, EDD,  
LA 가 QTDc(94.0±46.5  
ms vs 69.5±28.4 ms, p<0.05) EF(25.1±7.3% vs  
28.8±8.8% p<0.05)  
(Table 2, Fig. 1).  
3) QTDc

**Table 1.** Clinical characteristics of 174 enrolled patients with idiopathic dilated cardiomyopathy

	Group A (n=39)	Group B (n=135)	p
Age (years)	62 ± 11	59 ± 14	NS
Male, n (%)	25 (64)	85 (63)	NS
NYHA class			
I or II, n (%)	12 (31)	49 (36)	NS
III, n (%)	27 (69)	86 (64)	NS
Treatment at inclusion			
Digoxin, n (%)	29 (74)	111 (82)	NS
Diuretics, n (%)	33 (84)	126 (93)	NS
ACE inhibitor, n (%)	35 (90)	129 (96)	NS
Beta blocker, n (%)	3 ( 8)	13 (10)	NS

NYHA : New York heart association, ACE : angiotensin con-verting enzyme, NS : not significant

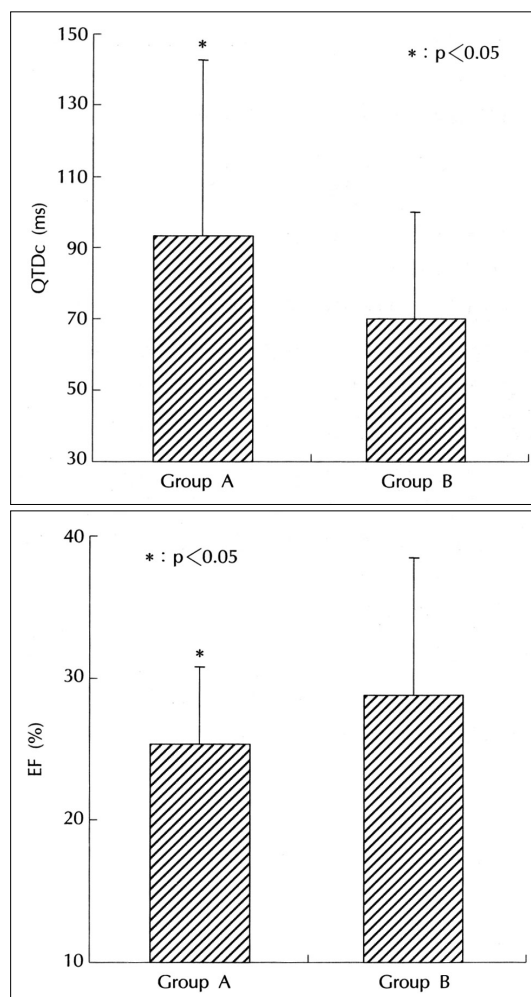
**Table 2.** Comparison of noninvasive parameters between 2 groups

	Group A	Group B	p
PR (ms)	164 ± 53	160 ± 28	NS
QRS (ms)	110 ± 25	106 ± 22	NS
QTDc (ms)	94 ± 47	70 ± 28	0.003
BBB (n)	6	16	NS
AF (n)	16	38	NS
LVH (n)	9	25	NS
EDD (mm)	68 ± 6	67 ± 7	NS
LA (mm)	48 ± 8	48 ± 8	NS
EF (%)	25 ± 7	29 ± 9	0.021

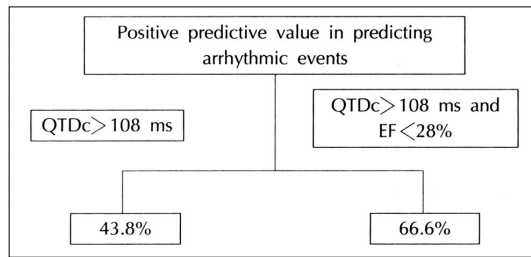
PR : PR interval, QRS : QRS duration, QTDc : rate corrected QT dispersion, BBB : bundle branch block, AF : atrial fibrillation, LVH : left ventricular hypertrophy, EDD : left ventricular end diastolic dimension, LA : left atrial size, EF : ejection fraction, NS : not significant

(RR : 1.03, 95% CI : 1.01 1.04, p<0.01).

4) QTDc cut off  
108 ms ( : 35%, : 96%, by  
receiver operating curve (ROC) analysis). QTDc가  
108 ms  
43.8%(7/16), 85.6%(83/97)  
. EF cut off  
28%( : 79%, : 47%, by ROC ana -  
lysis) QTDc가 108 ms  
28% 가  
66.6%  
(8/12) (Fig. 2).



**Fig. 1.** Difference of QTDc and EF Between 2 groups. QTDc : rate corrected QT dispersion, EF : ejection fraction.



**Fig. 2.** The highest positive predictive value in predicting lethal ventricular arrhythmic events was calculated when QTdC and EF were combined. QTdC: rate corrected QT dispersion, EF: ejection fraction.

고찰

QTdC

QTdC, QT -

Dc가 108 ms

28%

가

IDCM

3

3

(ACE inhibitor)

가<sup>15)</sup>

가<sup>16)</sup>

ICD

IDCM

가

QT dispersion, T wave alternance, SA -

ECG, RR variations,

가

35%

ICD , ID -<sup>17)</sup>

CM

가

가<sup>13)</sup>

QTDC

가

가

(repolarization)

(action potential duration, APD)

APD 가 (reentry)

가<sup>18)</sup>

APD

(monophasic action potential, MAP)

APD

<sup>19)</sup>

가

12

QT Day<sup>20)</sup>

(ventricular pacing)

QTDC가 가

QTDC

가 (inhomogeneity)

QTDC MAPD

dispersion<sup>21)</sup>

QTDC

가

long QT Linker<sup>22)</sup> QTDC

QTDC

가 long QT

Priori<sup>23)</sup>

가

QTDC

가

QTDC left stellate ganglion -  
ectomy QTDC가

QTCD가 가

24) IDCM beta - adrenergic receptors (autoantibody)가

25)가 IDCM extracellular loop 가 beta - adrenergic receptors

4) 135 IDCM QTD Fei 가 beta - adrenergic receptors

sympathomimetic - like action

가 RR variation (EF<30%)

QTCD Grimm 5) 가 가

28) (struct -

26) Pye 가 ual), (metabolic), (neuroendocrine)

, IDCM, mechano-electrical feed - back 29)

QTCD가 IDCM 76 ms,

82 ms, 67 ms

40 ms, 38 ms, 32 ms

가 ID -

CM QTD 가 IDCM

QTD 가

6) 205 24

IDCM QTD가 80 ms ICD

■ 연구의 제한점

QTDC가 가 T wave alt -

IDCM ernance, RR variation, SAECD

가 가

가

IDCM 가

가 (asystole) 가

27) 가 가 30)

가

가

요 약

배경 및 목적 :

가

가

방 법 :

174

PR , QRS ,

QT dispersion

가

A B

결 과 :

38 ± 19 174 39

( 4 ,

1 , 34 ). A B

QTDC(94.0 ± 46.5

ms vs 69.5 ± 28.4 ms, p<0.05) (25.

1 ± 7.3% vs 28.8 ± 8.8% p<0.05)

가

QTDC

(RR : 1.03,

95% CI : 1.01 1.04, p<0.01). QTDC가 108 ms

43.

8%(7/16) 85.6%(83/97) . QT -

Dc가 108 ms 28%

66.6%(8/12)

결 론 :

QT dispersion

가

중심 단어 : ; ; ;

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