

승모판 일탈 증후군의 심박 변동성

신영우 · 오현명 · 김종원 · 홍택중

Heart Rate Variability in Mitral Valve Prolapse Syndrome

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ABSTRACT

Background and Objectives : Studies in patients with mitral valve prolapse syndrome (MVPS) have shown the coexistence of various forms of autonomic dysfunction, and so this is an area that requires further investigation.

Materials and Method : The study group consisted of 65 patients (36 men and 29 women), aged 16 to 43 years (mean \pm SD, 28 \pm 8) with symptomatic, echocardiographically proven mitral valve prolapse (MVPS) who were free of other organic heart diseases and arrhythmias. In a prospective study, heart rate variability (HRV) indexes were calculated from 24-hour Holter recordings obtained during normal daily activity and plasma norepinephrine was measured, and then these data were compared among the study group according to clinic heart rate (HR).

Results : The study group was divided into below 60 bpm (group 1 : n=13), 60 -80 bpm (group 2 : n=36) and over 80 bpm (group 3 : n=16) on the basis of clinic HR. These patient groups were matched with respect to age and gender. There were significant difference in SDNNIDX, rMSSD and pNN50 between these groups ($p=0.005$, 0.009 and 0.002 respectively), and these HRV measures correlated inversely with clinic HR ($p<0.01$). As clinic HR increased, there was a tendency for plasma norepinephrine concentration to also rise ($p<0.05$), but there was no statistical significant difference between these groups. **Conclusion** : Our data suggests that MVPS may have subgroups of HRV, reflecting cardiac autonomic modulation, according to clinic HR. (**Korean Circulation J 1998;28(12):1973-1980**)

KEY WORDS : Mitral valve prolapse syndrome · Heart rate variability.

서 론

가

가

가

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: 1998 10 8

: 1999 2 5

: , 602 - 739

1가 10

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대상 및 방법

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pinephrine 24 Holter . 1) (0.04 0.15 Hz) (0.15 0.4 Hz) (nuLF), 2) (nuHF), 3) LF /HF (LF/HF). 24 R - R R - R 가 , R - R

Hewlett Packard SONOS 2500 Perloff ⁴⁾ Spearman's correlation coefficient ,

High - Performance Liquid Chromatography . 24 Holter cassette Delmar Avionics 750A Innovator 가

R - R

진료실에서의 심박수에 따른 대상환자의 분류

가 60 (1) 13 , 60 80 (2) 36 80 (3) 16 . (Table 1).

진료실에서의 심박수와 나이, 성별 및 심박변동성의 지표들과의 상관관계

가 (pNN50) 9 11 , norepinephrine (r=0.29, p<0.05). R - R interval (r=0.33, r =

Table 1. Characteristics in patients with mitral valve prolapse syndrome according to clinic heart rate

	Group 1	Group 2	Group 3	p Value
Clinic HR (bpm)	less than 60	60 - 80	more than 80	
No. cases	13	36	16	
Age (mean \pm SD, yrs)	29 \pm 8	29 \pm 7	26 \pm 8	NS
Sex				NS
Male	5	22	9	
Female	8	14	7	

HR : heart rate

0.48, $p < 0.01$).

, 1, 2, 3

($p < 0.00001$),

가
가
가

($r = 0.46$, $p < 0.01$).

SDNN, SDANN SDNNIDX

($r =$

1

($p = 0.002$).

- 0.34 $p < 0.01$, $r = - 0.28$ $p < 0.05$, $r = - 0.46$ $p < 0.01$)

가

가

(Table 2).

가

1

가

rMSSD pNN50

($r = - 0.47$, $r = -$

가

0.42 $p < 0.01$).

가

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,

. SDNN 1

($r = - 0.32$, $r = - 0.31$, $p < 0.05$),

SDANN

(Table 3).

($p = 0.009$)

1, 3, 2

. SDNNIDX

($p = 0.005$).

SDNNIDX

($p = 0.007$).

rMSSD

진료실에서의 심박수로 구분된 환자군에 따른 심박 변동
성 지표 값의 차이

($p = 0.009$), RMS -

norepinephrine

1, 2, 3

가

SD

($p =$

0.007) rMSSD

가

가

. pNN50

Table 2. Correlation of clinic heart rate with age, sex, plasma norepinephrine and overall heart rate variability measurements

	Age	Sex	NE	H	L	H - L	mHR	SDNN	SDANN	SDNNIDX
r value	NS	NS	.29*	.33**	.48**	NS	.46**	- .34**	- .28*	- .46**

NS : $p > 0.05$; * $p < 0.05$, ** $p < 0.01$

NE : plasma norepinephrine, H : heart rate at the peak frequency of lower R-R intervals of R-R interval histogram

L : heart rate at the peak frequency of higher R-R intervals of R-R interval histogram, H-L : difference between H and L

mHR : mean heart rate of a 24hr recording, SDNN : the standard deviation(SD) of normal-to-normal R-R intervals

SDANN : SD of 5 min mean normal R-R intervals, SDNNIDX : mean of all 5 min SD of normal R-R intervals.

Table 3. Correlation of clinic heart rate with heart rate variability of time domain measurements reflecting vagal tone and frequency domain measurements.

	rMSSD	pNN50	Day time			Night time		
			nuLF	nuHF	LF/HF	nuLF	nuHF	LF/HF
r value	- .47**	- .42**	NS	NS	NS	NS	- .32*	.31*

NS : $p > 0.05$, * $p < 0.05$, ** $p < 0.01$

rMSSD : the root-mean square of the difference of successive normal R-R intervals, pNN50 : % of the differences between adjacent normal R-R intervals 50ms, nuLF : normalized low-frequency band power, nuHF : normalized high-frequency band power, LF/HF : LF/HF ratio.

(p=0.02) 가 진료실에서의 심박수로 구분된 각 환자군에서 혈중 norepinephrine 치에 따른 빈도

LF/HF 1 3 가 60 1 norepinephrine 199 pg/ml 가 60%, 200 299 pg/ml 20%, 300 399 pg/ml 가 10% 400 499 pg/ml

(Table 4).

Table 4. Heart rate variability according to clinic heart rate

Measurements	Group 1	Group 2	Group 3	P*
NE (pg/ml)	224 ± 130	252 ± 126	322 ± 137	NS
HR-L (bpm)	1 ± 6	9 ± 9	31 ± 8	0.0000
H (bpm)	76 ± 13	82 ± 10	88 ± 4	NS
L (bpm)	52 ± 7	61 ± 9	62 ± 6	0.002
H-L (bpm)	24 ± 12	21 ± 9	27 ± 9	NS
mHR (bpm)	67 ± 8	76 ± 8	78 ± 6	0.009
SDNN (ms)	199 ± 41	155 ± 48	166 ± 49	0.02
SDANN (ms)	182 ± 43	137 ± 43	153 ± 45	0.009
SDNNIDX (ms)	81 ± 17	63 ± 17	61 ± 21	0.005
SDNNIDX-Dif (ms)	23 ± 17	17 ± 11	9 ± 7	0.007
rMSSD (ms)	49 ± 16	36 ± 13	33 ± 16	0.009
rMSSD-Dif (ms)	28 ± 25	16 ± 12	11 ± 10	0.007
PNN50 (%)	22 ± 11	14 ± 10	11 ± 11	0.02
LF/HF ratio (day)	3.6 ± 2.5	4.2 ± 2.2	4.5 ± 2.5	NS
LF/HF ratio (night)	0.6 ± 0.3	0.8 ± 0.9	1.1 ± 0.7	NS

Values are expressed in mean ± SD

* F probability in analysis of variance

HR-L : Clinic heart rate minus L, SDNNIDX-Dif : difference between night time and day time SDNNIDX, rMSSD-Dif : difference between night time and day time rMSSD

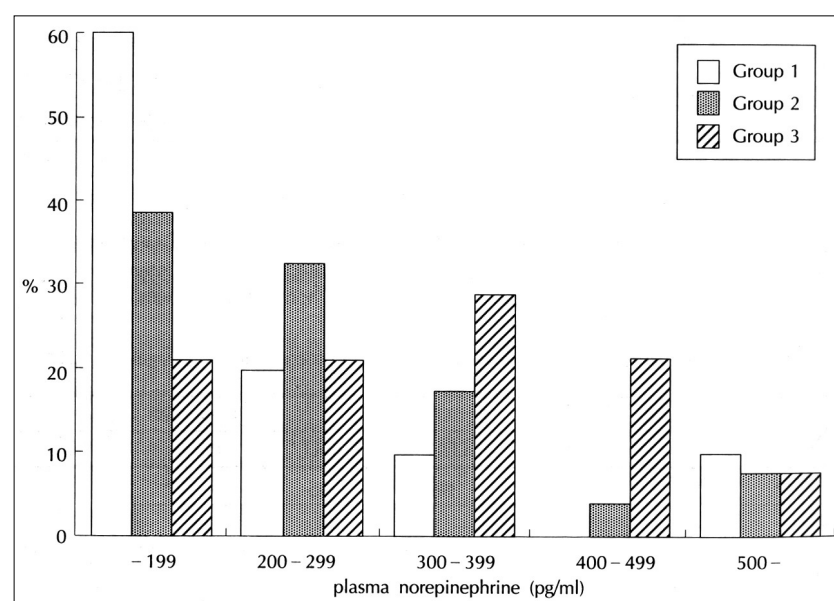


Fig. 1. Frequency distribution of plasma norepinephrine values in each group according to clinic heart rate.

ml, 500 pg/ml 가 10%
 , 60 80 2
 39%, 32%, 18%, 4% 7% , 80
 3 21%, 21%,
 29%, 21%, 7% 가 1²⁾³⁾¹²⁾¹³⁾
 norepinephrine 가¹²⁾¹³⁾
 가 , 가 3 R - R R - R
 norepinephrine 가 R - R
 (Fig. 1). SDNN, SDANN, SDNNIDX
 . R - R
 R - R R - R
 고 찰 가
 , SDNN R - R
 , , , , , ,
 .¹⁾ R - R
 . SDANN
 SD - NN 5 R - R
 R - R
 가
¹⁾⁶⁾⁷⁾ SDNNIDX 5
 , 가
 가 R - R
 가 rMSSD PNN50
 R - R
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 R - R
 , HF LF, HF LF/HF
⁸⁾ 가 , LF/HF
 , LF/HF
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¹⁰⁾¹¹⁾
 SDNN, SDANN
 SDNNIDX r - 0.34, - 0.28, - 0.46
 SDNNIDX

가

가 rine

SDNNIDX 1 9) 1 no -

2 3 repinephrine 3

1 2 , 3 가 9)11)

가 SDNNIDX

rMSSD norepinephrine

pNN50 r -0.47 -0.42 가

1 2 , 가 18)

3 rMSSD pNN50 가 norepinephrine

rMSSD, pN - N50 가

LF/HF 가

LF/HF 가

가

9)11)

1 2 , 3 , 24 Holter

가 SD - NNIDX, rMSSD PNN50

가 9 11

2 4

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14)15)

(r=0.46), 1 2)12)

2 , 3 가

가

가

Korlowski 21)

가 가

5가

가

34%

76%

36.8%

52%

4%

8%

norepinephrine

9)16)17)

norepineph - 가 6)

Fontana¹⁾

요 약

연구배경 :

가

방 법 :

65 (가 36 , 가 29) 가 16
43 (± 28 ± 8)
가
, 24 Holter
, norepinephrine

결 과 :

가 60 1 , 60 80
2 80 3 ,
13 , 36 16 .
SD -
NNIDX, rMSSD pNN50 (가 가
p=0.005, 0.009 0.002), 가 가
(p<0.01). norepinephrine
가 가 가
(p>0.05),

결 론 :

중심 단어 :

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