운동부하 심전도검사상 회복기 단독 ST분절 하강소견의 의미

이남호·최승혁·박우정·조구영·최영진·박대균·홍경순
두영철·한규록·오동진·유규형·임종윤·이광학·이 영

"Recovery Only" ST-Segment Depressions in an Exercise Treadmill Test and the Prediction of Coronary Artery Disease

Namho Lee, MD, Seung-Hyuk Choi, MD, Woo-Jung Park, MD, Koo-Yung Cho, MD, Yung-Jin Choi, MD, Dae-Kyun Park, MD, Kyung-Soon Hong, MD, Young-Cheoul Doo, MD, Kyoo-Rok Han, MD, Dong-Jin Oh, MD, Kyu Hyung Ryu, MD, Chong-Yun Rhim, MD, Kwang-Hahk Lee, MD and Yung Lee, MD

Department of Internal Medicine, College of Medicine, Hallym University, Seoul, Korea

ABSTRACT

Background and Objectives "Recovery only" ST-segment depressions are sometimes detected during an exercise treadmill test. We undertook this study in order to clarify the predictive value of exercise-induced ST-segment depression occurring in recovery only. **Subjects and Methods** The study included 931 patients who had both a sign or symptom-limited treadmill test. Of the 66 patients who demonstrated abnormal ST-segment responses, 43 experienced ST-segment depressions during exercise (Group A) and 23 displayed such responses only during recovery (Group B). **Results** The positive predictive value of an exercise treadmill test for significant angiographic disease in group A (81.3%) was statistically different from the predictive value in group B (30.4%). Horizontal ST-segment depression in recovery periods and female sex were statistically significant factors favoring negative coronary angiographic results. **Conclusion** The occurrence of horizontal mild ST-segment depression during only the recovery periodgenerally represents a "false positive" response, particularly in female patients. **(Korean Circulation J 2002;32(2):131-136)**

KEY WORDS Exercise test   Coronary disease.

서　론

ST

ST

ST

42　90%[1-3]

ST ... ...

, ,

, 2 mm

. ST , 10 mmHg

대상 및 방법

.

1 mm ST

대 상

J 0.08 .

1997 3 1999 12

관동맥 조영술

Seldinger's technique

931 129

5 Fr Judkin's coronary catheter

Amplatz coronary catheter

, 1 50%

artifacts , .

66 ST

분석 및 통계

A (Fig. 1), ST

dBSTAT program

B (Fig. 2)

Student's t- test, Fishers ex-

. act test p 0.01 0.05

운동부하심전도 검사

.

,

modified Bruce pro-

결 과

tocol[4] .

3

양군의 임상상 및 운동부하심전도검사 지표비교

, 12 .

A 43 , B 23 ,

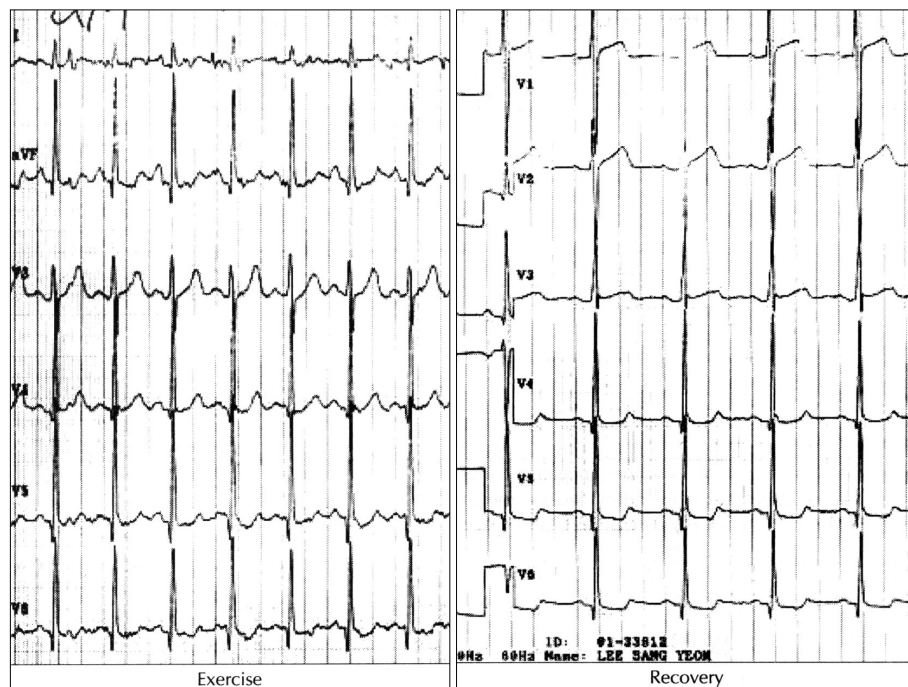**Fig. 1.** Findings of exercise treadmill test of group A patients.

Fig. 2. Findings of exercise treadmill test of group B patients.

B 23

22

(Target heart rate) 80% 1

75% .

ST horiz-

ontal horizontal

20 30% downsloping

. ST A 1

mm 2 mm 23 19

B 1 22 1 mm

A 1 mm 2 mm 26 16

(Table 1).

운동부하심전도 검사와 관동맥조영술과의 관계

A 43 35

B 23 7

A B (positive predictive

value) 81.3%, 30.4%

Table 1. Baseline characteristics of subjects

	Group A (n 43)		Group B (n 23)		p
Age (years)	59± 11		56± 10		NS
Sex (M/F)	21/22		13/10		NS
Exercise times (min)	6.9± 3.1		7.4± 3.4		NS
Peak HR (% of THR)	85.2± 11.8		89.3± 8.9		NS
ST depressions (numbers)					
Exercise	upsloping 2				
	downsloping 1				
	horizontal 40				
Recovery	downsloping 12		downsloping 5		
	horizontal 31		horizontal 18		
Exercise	1 mm 23				
	2 mm 19				
	3 mm 1				
Recovery	1 mm 26		1 mm 22		
	2 mm 16		2 mm 1		
	3 mm 1				

Group A, B ST depressions during exercise (A), ST depressions only in recovery periods (B), HR heart rate, THR target heart rate, NS not significant

Table 2. Correlations between exercise treadmill and coronary angiographic results

Pattern of ST depression (recovery periods)	Group A (n= 43)		Group B (n= 23)		p
	Horizontal	Downsloping	Horizontal	Downsloping	
Subjects	31	12	18	5	
CAG positive	35		7		p< 0.01
	24	11	3	4	
CAG negative	8		16		p< 0.01
	7	1	15	1	
CAG negative					
Male	0		6		p< 0.05*
Female	8		10		
Horizontal (recovery)	7		15		p< 0.05†
Downsloping (recovery)	1		1		

CAG coronary angiography, CAG positive, negative more than 50% diameter stenosis at least one coronary artery (positive), normal or minimal coronary artery lesions (negative), * p value between sex and CAG results, † p value between ST depression patterns in recovery periods and CAG results

A   B   Lachterman [3]

.   ST   patterns   6%   13%   ST

.   ST

B   ST   patterns   horizontal   Savage

18   15   [1] 62   ST

, downsloping   5   1   26   42%

. ST   Karnegis [2]

patterns   downsloping   A   12   Lachterman [3]   90%   84%

1   .   .   Sestito [6]   78%

ST   patterns   downsloping

horizontal   57   6%

.   ST

9%

A   22   .   30.4%

8   B   ST

10   (23   22)

(Table 2).   ST   (1 mm)

.   ST

고   찰

ST   ,   ,

ST

ST

.

. Bittner [5]   6 minute   ST   pa-

walk test   10%   tterns   downsloping   horizontal

ST   Karnegis [2]   .   ST

patterns horizontal 18 15 .

downslop-
ing 5 4 .

ST pa-
tterns

.

J- point upslop-
ing ST ⁷⁾ [7]

transmural gradient ho-
rizontal ST [8]

ST pa-
tterns downsloping .[9][10]

ST patterns downsloping

.

ST

Tesloianu [11]

ST
(11 7) (4)
.

Clark [12] cat-
echolamines

preovulation

.

ST
Maseri [13]
, Di-
msdale [14]
catecholamines

. Savage [1]
venous return

. Lachterman [3]

ST

ST ST
2 mm ST patterns
horizontal
. ST
2 mm pat-
terns downsloping

.

요 약

배경 및 목적 :
ST
ST .
ST

.

방 법:
1997 3 1999 12
66
ST A ,
ST B
.

결 과:
A 43 , B 23 A B
(positive predictive value)
81.3%, 30.4% A
. ST patterns
. B
ST patterns horizontal 18
15
, downsloping 5 1
. ST
patterns downsloping A 12 1
. ST

patterns downsloping horiz-
ontal

.

A 22

8

B 10

.

결 론:

ST

ST 2 mm

ST

patterns horizontal

.

중심 단어 .

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