

실신 경험이 없는 성인을 대상으로 시행한 기립경사 검사

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Head-up Tilt Test in Subjects with No History of Syncope or Presyncope

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ABSTRACT

Background and Objectives : Head-up tilt test is increasingly being used to diagnose neurocardiogenic syncope. But the protocol of head-up tilt test has not been settled. The purpose of this study was to evaluate the effect of isoproterenol provocation during head-up tilt test in normal volunteers with no prior history of syncope or presyncope. **Method :** Head-up tilt test was performed with 53 volunteers (mean age 30 ± 9 years, male 27, female 26) in the fasting state. After supine heart rate and blood pressure were obtained, each volunteer was tilted to the 70 degree upright position for 30 minutes using a motorized tilt table with a footboard. If the test was negative in the baseline tilt, intravenous isoproterenol infusion was started at $1 \mu\text{g}/\text{min}$ and then increased by $1 \mu\text{g}/\text{min}$ every three minutes to a maximum of $5 \mu\text{g}/\text{min}$ while maintaining 70 degree upright position. The end points of test were positive response, intolerance to isoproterenol, heart rate >150 beat/min, and completion of the protocol. When an end point was reached, the volunteer was rapidly returned to the supine position. **Results :** Positive response to head-up tilt test was noted in 14 cases (26%). The pattern of positive response was vasodepressive in all cases. There was no significant side effect of isoproterenol. There was no significant difference between positive and negative response group in terms of age, sex, peak infusion rate of isoproterenol and hemodynamic response. The positive response rate at $2 \mu\text{g}/\text{min}$, $3 \mu\text{g}/\text{min}$, $4 \mu\text{g}/\text{min}$, and $5 \mu\text{g}/\text{min}$ of isoproterenol infusion was 1.9%, 9.7%, 23.7% and 32.5%, respectively. **Conclusion :** Head-up tilt test at 70 degree angle with isoproterenol infusion provided an adequate specificity. (**Korean Circulation J 2000;30(7):841-846**)

KEY WORDS : Head-up tilt test · Isoproterenol provocation · Normal volunteer.

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기립경사 검사

가 75%가 6%가 Lipstz 1) 가 (neurocardiogenic syncope neurally mediated syncope), (vasovagal syncope) 가

가 12-70 30 2 10 30 70

(head-up tilt test)가

isoproterenol provocation Isoproterenol provocation isoproterenol 1 µg/min 3 1 µg/min 가 5 µg/min Isoproterenol provocation 1

75% 21% 2-7) isoproterenol isoproterenol 6)13) isoproterenol 7) isoproterenol 가

(1) (2) isoproterenol (3) 가 150 (4) isoproterenol 5 µg/min (end points) 5

on isoproterenol provocati-

(1) (vasodepre-

대상 및 방법

ssive type) - 80 mmHg (2) (cardioinhibitory type) - 3 가 (3) isoproterenol 60 (mixed type) -

대상군

45 , isoproterenol 60 (3) (mixed type) -

통 계

가 isoproterenol

± Isoproterenol

53 14 (26%)

SPSS for window 7.5

Chi-square test, t-test . p

0.05 가 (Table 1).

14

65 ± 3 mmHg , 92 ± 6

결 과 41 ± 0.7 (

36 45) .

53

30 ± 9 (20 53) , , 2

27 (50.9%), 26 (49.1%) . (2 µg/min) isoproterenol

53 1 IgA

isoproterenol pro-

vocation , , isoproterenol

(Table 2).

(96%) isoproterenol , , isoproterenol

2 53 2 µg/min 2 1

Table 1. Hemodynamic responses during head-up tilt test between positive and negative tilt groups

	Positive tilt group n = 14	Negative tilt group n = 39	P value
Age (years)	28 ± 2	31 ± 1	NS
Supine systolic BP (mmHg)	108 ± 4	112 ± 2	NS
Supine diastolic BP (mmHg)	67 ± 3	72 ± 2	NS
Standing systolic BP (mmHg)	110 ± 4	116 ± 2	NS
Standing diastolic BP (mmHg)	75 ± 4	77 ± 2	NS
Peak systolic BP (mmHg)	126 ± 6	137 ± 3	NS
Peak diastolic BP (mmHg)	80 ± 2	83 ± 2	NS
Supine heart rate (bpm)	61 ± 1	63 ± 1	NS
Standing heart rate (bpm)	66 ± 2	68 ± 2	NS
Peak heart rate (bpm)	125 ± 5	134 ± 3	NS

Data presented as mean ± SEM. bpm indicates beats per minute. NS : not significant

Table 2. Comparison of positive response by patient characteristics and peak infusion rate of isoproterenol

		Number of patients	Positive response (%)	P value
Age	30 years	34	12 (35%)	NS
	> 30 years	19	2 (11%)	
Sex	Male	27	9 (33%)	NS
	Female	26	5 (19%)	
Peak infusion rate of isoproterenol	3 µg/min	10	5 (50%)	NS
	> 3 µg/min	43	9 (21%)	

NS : not significant

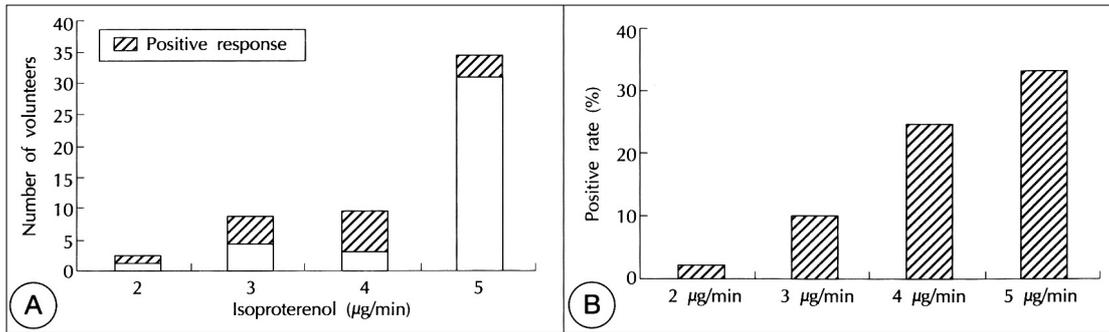


Fig. 1. A : Distribution of positive response by peak infusion rate of isoproterenol. B : Positive rate of head-up tilt test with isoproterenol.

(1/53, 1.9%), 3 µg/min 8 4 (1/53 +
 4/51, 9.7%), 4 µg/min 9 6 (1/53 +
 4/51 + 6/43, 23.7%), 5 µg/min 34 3
 (1/53 + 4/51 + 6/43 + 3/34, 32.5%)
 (Fig. 1A). isoproterenol 가
 가 (Fig. 1B).

고 찰

Fitzpatrick

60

12)

가

(autor -

egulation)

가

8 - 10)

21%

75%

2-7)

Raviele

3) 30

50%

, Youn 5) 21

23%

. Sheldon 6)

가

가

100

isoproterenol

90%

(unpublished data).

Kapoor 13)

Youn 5)

24

isoproterenol

60

60

75%

4%

65%

60

isoproterenol

가

isopr -

Kapoor Brant 13)

65%

oterenol

80

isoproterenol
10 가 . Natale ¹²⁾ isoproterenol provocation
isoprote-
가 80 renol ,
isoproterenol 가
. Isoproterenol 1.5 µg/min
4%, 3 µg/min 20%,
5 µg/min 65%
60 70 3 µg/min 요 약
isoproterenol 연구목적 :
70 , 30
iso - isopro -
proterenol . terenol .
isoproterenol 2 isoproterenol
µg/min 1.9%, 3 µg/min 9.7%, 4 µg/min
23.7%, 5 µg/min 32.5% , isoproterenol
가 가 isoproterenol
Natale 65%
, 26%
Natale isoprotere -
, 70 nol
isoproterenol provocation 방 법 :
, Natale isoproterenol 53
isoproterenol 1 µg/min isoproterenol 70
가 20% 가 30
70
isoproterenol provocation
. Isoproterenol provocation iso -
isoproterenol 가 . proterenol 1 µg/min 3
1 µg/min 가 5 µg/min .
결 과 :
, 1999 30±9 (20 53)
, 27 (51%), 26 (49%) . Isop -
187 roterenol 53
134 14 (26%) ,
72% (unpublished data). (vasodepressive type)
70 . , , isoproterenol

isoproterenol	가	·
53 2 µg/min	2	1
(1/53, 1.9%), 3 µg/min	8	4 (1/53
+4/51, 9.7 %), 4 µg/min	9	6 (1/53
+4/51+6/43, 23.7%), 5 µg/min	34	3
(1/53+4/51+6/43+3/34, 32.5%)		

결 론 :

70

isoproterenol provocation

isoproterenol

중심 단어 : Isoproterenol

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