

아데노신 정주에 의한 동기능 부전 증후군의 진단

엄재섭 · 차태준 · 권기범 · 김찬욱 · 신성훈 · 김성만
강승수 · 전익수 · 김민대 · 주승재 · 이재우

Diagnosis of Sick Sinus Syndrome with Intravenous Adenosine Injection

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ABSTRACT

Background : The most widely utilized indexes of sinus node dysfunction are the sinus node recovery time (SNRT) and the corrected sinus node recovery time (CSNRT), both of which generally require catheterization. Adenosine exhibits negative chronotropic effects on the sinoatrial node. The use/accuracy of the Non-invasive and reliable sinus node function test with intravenous adenosine was investigated. **Methods and Results :** The clinical value of rapid intravenous injection of adenosine for the assessment of sinus node dysfunction was examined in 14 patients with sick sinus syndrome (SSS) and 31 controls. After prophylactic insertion of a temporary pacemaker in the right ventricle, overdrive suppression test was conducted according to the standard technique. CSNRT was first measured to evaluate the sinus node function, and then measured again, after administration of an intravenous bolus of adenosine (6 mg and 12 mg). Post-adenosine corrected sinus node recovery time (ADO : CSNRT) was calculated by subtracting the basal sinus cycle length from the longest sinus cycle length. When it was assumed that an ADO : CSNRT reading of over 550 msec indicated sinus node dysfunction, intravenous injection of 6 mg of adenosine exhibited a sensitivity of 85% and a specificity of 100% for the detection of sick sinus syndrome, while 12 mg had a sensitivity of 100% and a specificity of 90%. There were significant differences in ADO : CSNRT between the patient and control groups (6 mg 1501 ± 1081 msec vs 64 ± 109 msec ; 12 mg 4005 ± 2055 msec vs 216 ± 315 msec, respectively). **Conclusion :** ADO : CSNRT was found to be a highly sensitive and specific index for the diagnosis of sick sinus syndrome, and should be considered as an alternative to invasive testing in patients with suspected sick sinus syndrome. (Korean Circulation J 2001;31(8):788-793)

KEY WORDS : Adenosine · Corrected sinus node recovery time · Sick sinus syndrome.

서 론

20 50%가

1)

: 2001 1 31
: 2001 5 30
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가 , 가 14

24 , 61 ± 11

(Table 1).

가 31 , 56 ± 15 , :

12 : 19 . 11 ,

가 .²⁾ 9 , 7 , 4

(p<0.01).

48

(ADO : adenosine)

심전기 생리학적 검사

3)

가 7)

A1

A2 (quadripolar catheter)

4)

His

potassium ou - 가

tward current I_{KACh}, Ado A1 (oscilloscope) , Cardio Lab Sy -

ion cur - stem(Prucka Engineering, Houston, TX, USA)

rent(I_{Ca}, I_f, I_{Ti}, I_{Cl} and I_{Ks})

6)

60 600 msec

(SCL : sinus cycle length),

(SNRT : sinus node recovery time)

(CSNRT : corrected sinus

node recovery time) 60

가 , 500 msec, 400 msec

대상 및 방법

10

대 상

24

Table 1. Characteristics of study groups

	Patients (n = 14)	Controls (n = 31)
Age (yrs)	61 ± 11	56 ± 15
Male/Female	0/14	12/19
Ejection fraction (%)	67 ± 7	61 ± 11

(6 mg bolus 10 cc bolus 가 6 mg 10 12 mg (10 cc bolus 550 msec 가 (ADO : SNRT) 1 6 mg (ADO : CSNRT) . Back - up pacing 가 ade - nosine P 가 theophyllin P adenosine P (intrac - ardiac electrogram) (high right atrial electrogram : HRA), His (His elec - trogram), (coronary sinus elec - trogram) (activation se - quence)가

550 msec 1) 가 pres - yncope P 통계 분석 ± Student's t test , Pearson chi - square test windows SPSS , p 0.05

결 과

Table 2

24

Table 3

500 msec, 400 msec

60 600 msec,

6 mg, 12 mg

Table 2. Clinical and electrophysiologic characteristics of patients with sick sinus syndrome

Patient	Age/sex	Other cardiac diagnosis	CSNRT after 600 ms pacing	ADO : CSNRT (msec) 6 mg	ADO : CSNRT (msec) 12 mg
1	73/F	PAF	545	2970	7375
2	66/F	IHD	176	1319	4458
3	61/F	None	2303	1049	1369
4	47/F	None	479	205	3118
5	62/F	None	1585	1979	1061
6	64/F	None	599	73	1094
7	75/F	None	0	774	2668
8	41/F	None	4159	2698	4870
9	55/F	None	1311	1516	4068
10	75/F	None	907	971	5663
11	71/F	HHD	3761	1696	6659
12	59/F	None	1890	623	5359
13	66/F	None	0	3655	4311

CSNRT : Corrected sinus node recovery time, ADO : CSNRT : Postadenosine corrected sinus node recovery time, HHD : Hypertensive heart disease, IHD : Ischemic heart disease, PAF : Paroxysmal atrial fibrillation

Table 3. Comparison of CSNRT (msec) between patient and control groups after rapid atrial pacing (600, 500, and 400 msec) or adenosine injection (6 mg and 12 mg)

	600 msec	500 msec	400 msec	ADO 6 mg	ADO 12 mg
Control	376 ± 164	313 ± 143	297 ± 237	64 ± 109	216 ± 315
Patient	1875 ± 1568*	2774 ± 2401*	2418 ± 2011*	1501 ± 1081*	4005 ± 2055*

CSNRT : Corrected sinus node recovery time, ADO : Adenosine, * : p<0.01

Table 4. Sensitivity and specificity of adenosine for diagnosing sick sinus syndrome

	ADO : CSNRT (6 mg)		ADO : CSNRT (12 mg)	
	>550	550	>550	550
Patient	11	2	13	0
Control	0	31	3	28
Sensitivity	85%		100%	
Specificity	100%		90%	
(+) Predictive value	100%		81%	
(-) Predictive value	94%		100%	

ADO : adenosine

CSNRT : Corrected sinus node recovery time

Table 5. Correlation of corrected sinus node recovery time between pacing and adenosine

	Adenosine 6 mg		Adenosine 12 mg	
	R value	p	R value	p
600 ms CSNRT	0.661	<0.01	0.573	<0.01
500 ms CSNRT	0.426	<0.01	0.536	<0.01
400 ms CSNRT	0.506	<0.01	0.594	<0.01

CSNRT : corrected sinus node recovery time

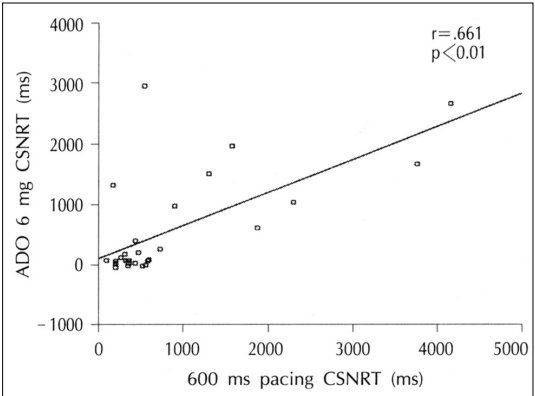


Fig. 1. Correlation of corrected sinus node recovery time between 600 msec pacing and adenosin 6 mg.

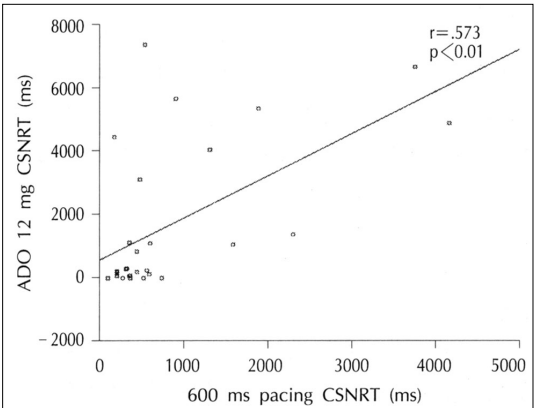


Fig. 2. Correlation of corrected sinus node recovery time between 600 msec pacing and adenosin 12 mg.

가 (p<0.01).

Table 4

550 msec

, 6 mg, 12 mg

6 mg 85%, 100% , 12 mg 100%, 90% . 6 mg, 12 mg 100%, 94% 81%, 100%

Table 5 Figs. 1 2 6 mg, 12 mg (p<0.01)가

고 찰

6

mg 600 msec, 500 msec, 400 msec

12 mg 600 msec, 500 msec, 400 msec

가

A1 가

1)
(70%) (95%), (70%) ⁶⁾
(95%)

2
가 .
(6 mg, 100% :
12 mg, 90%) (6 mg, 94% : 12 mg
100%) , 가
가 .
1)(6)(8)(9)

1 . 1 가
Burnett ¹⁾ Resh
8)

, 6 mg
12 mg (6 mg 100% : 12
mg 90%) , (6 mg 85% : 12 mg 100%)
가 ,
(6 mg 1501 ± 1081 msec : 12 mg 4005 ± 2055
msec) 12 mg
가
6 mg 12 mg
¹⁰⁾

요 약

(12 , 29) 연구목적 :
6 mg
83 ± 108 msec, 가
53 ± 111msec, 12 mg
116 ± 236 msec,
247 ± 359 msec , 가 가
 ,

대상 및 방법 :
 14
 31
 1 600
 msec, 500 msec, 400 msec
 6 mg, 12 mg
 >550 ms 6
 mg, 12 mg 600 msec, 500 msec,
 400 msec
 결 과 :
 600 msec, 500 msec, 400 msec
 6 mg, 12 mg
 1875 ± 1568 msec, 2774 ± 2401
 msec, 2418 ± 2011 msec, 1501 ± 1081 msec, 4005
 ± 2055 msec , 376 ± 164 msec, 313
 ± 143 msec, 297 ± 237 msec, 64 ± 109 msec, 216 ±
 315 msec , 가
 (p<0.01). 6 mg 85%,
 100% , 12 mg 100%,
 90% . 6 mg, 12 mg
 600 msec, 500 msec, 400
 msec

가
 결 론 :
 가
 중심 단어 :

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