

## 좌심실 기능부전을 동반한 만성 관상동맥질환에서 Dobutamine 심초음파의 역할

정보영<sup>1</sup> · 임세중<sup>1</sup> · 최승혁<sup>1</sup> · 고충원<sup>1</sup> · 하종원<sup>1</sup> · 정남식<sup>1</sup> · 유경종<sup>2</sup> · 강면식<sup>2</sup>

### Dobutamine Echocardiography in Chronic Coronary Artery Disease with Left Ventricular Dysfunction

Bo Young Chung, MD<sup>1</sup>, Se-Joong Rim, MD<sup>1</sup>, Seung Hyuck Choi, MD<sup>1</sup>, Choong Won Goh, MD<sup>1</sup>,  
Jong-Won Ha, MD<sup>1</sup>, Namsik Chung, MD<sup>1</sup>, Kyung Jong Yoo, MD<sup>2</sup> and Meyun Shick Kang, MD<sup>2</sup>

<sup>1</sup> Cardiology Division, <sup>2</sup> Division of Cardiovascular Surgery, Yonsei Cardiovascular Center, Yonsei University College of Medicine, Seoul, Korea

#### ABSTRACT

**Background** : Dobutamine echocardiography has been shown to be a valuable tool for determining myocardial viability in both acute and chronic coronary artery disease with left ventricular dysfunction. The purpose of the our study was to identify the role of dobutamine echocardiography in the prediction of improvement of regional left ventricular (LV) dysfunction after revascularization of chronic coronary artery disease. **Methods** : Twenty-three patients (mean age 61.2 ± 9.0 years ; 20 men) with chronic LV dysfunction underwent dobutamine echocardiography (dobutamine : baseline, 5, 10, 20 µg/Kg/min) before coronary revascularization (coronary artery bypass graft surgery 16, percutaneous coronary angioplasty 7). The mean LV ejection fraction was 42.9 ± 8.8% with ranging from 26% to 58%. Follow-up echocardiography was performed at 2 to 21 months (mean 9.0 ± 6.2 months) after revascularization. **Results** : During dobutamine echocardiography, there was no major complication. Improvement of the dysfunctional myocardium was observed in 12 of 23 patients in dobutamine echocardiography. Among them, 10 patients showed functional recovery after revascularization. Another 11 patients did not show improvement of dysfunctional myocardium in dobutamine echocardiography, however 3 of them showed functional recovery after revascularization. One hundred fifteen dysfunctional segments were found in 368 segments of 23 patients, and improvement of wall motion abnormality was observed in 46 of 115 segments in dobutamine echocardiography. Among them, 31 segments showed functional recovery after revascularization. Another 69 segments did not show wall motion improvement in dobutamine echocardiography. But among them, 13 segments showed functional recovery after revascularization. The sensitivity and specificity of dobutamine echocardiography for the prediction of postoperative improvement of segmental wall motion were 70% and 79%, respectively. The positive and negative predictive value of dobutamine echocardiography were 67% and 81%, respectively. **Conclusion** : In patients with chronic LV dysfunction, dobutamine echocardiography can be used as a predictor of the improvement of dysfunctional segments after revascularization. (**Korean Circulation J 1998;28(8):1237-1243**)

**KEY WORDS** : Dobutamine Echocardiography · Left ventricular dysfunction · Revascularization.

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) (02) 361 - 7071, ) (02) 393 - 2041

E - mail : sejoong@yumc.yonsei.ac.kr

서 론

baseline, 5 ug/kg/min, 10 ug/kg/min, 20 ug/kg/min  
 가 (peak dosage) 가  
 가 85% , 2 mm  
 가 ST ,  
 (revascularization) , 220 mmHg ,  
 가 <sup>1)2)</sup> 10 mmHg ,  
 가 가  
 , nitroglycerin esmolol . 가  
 standard imaging ECG R - wave - triggered mechanism digital image acquisition continuous loop quad screen  
 Thallium - 201 scan, Positron Emission Tomography dob - utamine , dob - utamine <sup>3-9)</sup> . standard 12 lead ECG

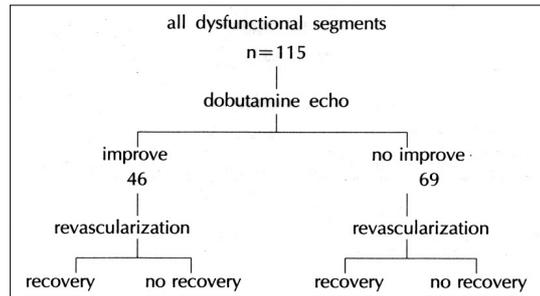
dobutamine

연구대상 및 방법

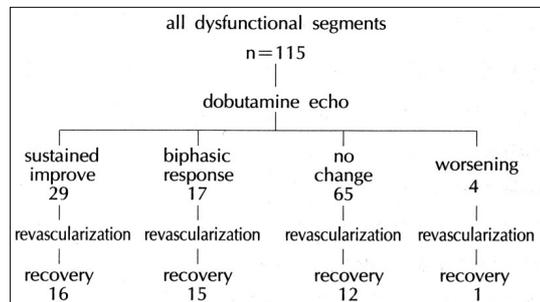
연구대상 1995 10 1997 5  
 ( )  
 dobutamine 23 2 가  
 1 dobutamine 가  
 ,  
 American Society of Echocardiography 16 segment seg - ment semiquantitative scoring system (1, normal ; 2, mild to moderate hypokinetic ; 3, severe hypokinetic ; 4, akinetic 5, dykinetic)  
 연구방법  
 Dobutamine  
 Dobutamine segment wall  
 left lateral decubitus position motion score 1  
 3 dobutamine infusion dosage .

**결 과**

1) 20, 3, 44, 73, 61.2±9.0, 13, 13, 3, 1, 가 4, 6, 15, 2, 6, 3, 13, 2, 가 1, 3, 가 3, 26%, 58%, 42.9±8.8%, 2) Dobutamine 18.7, ±26.4, , dobutamine, 가 1, ST, 가 2, 1, , 1, 3) Dobutamine 12, , 11, 6.2, dobutamine, , 가, 4) severe hypokinesia 55, 7), akinesia 57, dyskinesia, 3, dobutamine, 115, , 4, sustained impr-ovement 29, biphasic response, 가 17, no change, 가 65, worsening, 가 4, , 5) 16, 7, 3.3±0.7, 가 3, 1.7, 6) 2, 21, ( 9.0±

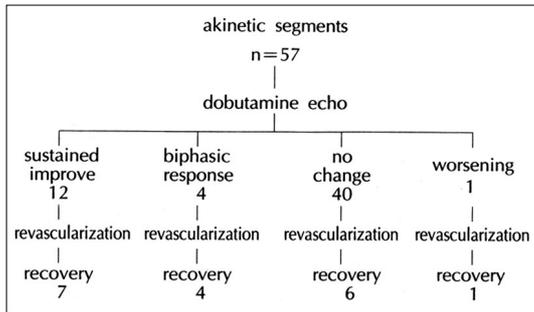


**Fig. 1.** Organization charts showing the improvement of regional systolic function during dobutamine infusion and after coronary revascularization in all dysfunctional segments.



**Fig. 2.** Organization charts showing four different responses of dobutamine infusion and the effect of coronary revascularization on regional systolic function in all dysfunctional segments.

dobutamine, 11, 6.2, , 가, dobutamine, 12, , dobutamine, 115, , 4, sustained impr-ovement 29, biphasic response, 가 17, no change, 가 65, worsening, 가 4, , 8) severe hypokinesia, akinesia, dyskinesia 115, 가 dobutamine (sustained impro-vement biphasic response) 46, 31, , 69, 13, (Fig. 1). dobutamine sustained im-provement 29, 16, ,



**Fig. 3.** Organization charts showing four different responses of dobutamine infusion and the effect of coronary revascularization on regional systolic function in the subgroup of myocardial segments demonstrating akinesia before revascularization.

biphasic response 17 15 ,  
 no change 65 12 , worsening 4  
 1  
 (Fig. 2). akinesia  
 57 dobutamine  
 sustained improvement 12 7  
 , biphasic response 4  
 4 , no change 40 6 , worse -  
 ning 1 1  
 (Fig. 3).  
 9)

dobutamine 70%,  
 79% , positive predictive value 67%,  
 negative predictive value 81% .

### 고 안

regulation , down -  
 dobutamine  
 가 .  
 Cigarroa<sup>4)</sup> (multivessel  
 coronary disease) 가  
 dobutamine systolic  
 wall thickening 2  
 regional wall thickening score가  
 20% contractile reverse가

4 wall motion 가  
 25 contractile reserve가  
 11 9 , contractile res -  
 erved가 14 2  
 systolic wall thickening (( = .003)  
 dobutamine  
 가 가 ,  
 dobutamine  
 Afradi<sup>6)</sup> 20  
 stable coronary artery disease  
 dobutamine  
 dobutamine 2.5, 5, 7.5, 10, 20, 30, 40 ug/kg/  
 min 4가 (biphasic,  
 sustained improvement, worsening, no change)  
 functional re -  
 covery 가 biphasic  
 worsening response contractile reserve  
 sensitivity 74%, specificity 73%  
 dobutamine 4가  
 biphasic response 17 15  
 (88%)  
 positive predictability specificity가  
 , dobutamine  
 20 ug/kg/min sustained improvement  
 가 29 16  
 , dobutamine high dose  
 sustained improvement biphasic response  
 biphasic response sensitivity 가  
 . Perrone - Filardi <sup>9)</sup> do -  
 butamine myocardial perfusion scan  
 . , stable chronic coronary artery dise -  
 ase 가 18 dysfunctional  
 hypoperfused segments  
 quantitative 201Tl single - photon emission  
 computed tomography dobutamine (5  
 10 ug/kg/minute), radionuclide angiography  
 34 +/- 10 Single - photon em -

mission computed tomography echocardiography  
 , 45 +/- 13 radionuclide angiography  
 . Systolic function 1 (nor -  
 mal) 4(dyskinesia) , functional  
 improvement 1 grade score change가  
 . 79 dysfunctional  
 hypoperfused  
 48 42 (88%) dobutamine  
 , 31  
 dobutamine  
 27 (87%) dobutamine  
 Functional improvement improve -  
 ment .  
 가  
 dobutamine 가  
 , Arnese <sup>7)</sup> dobut -  
 amine 201thallium SPECT ,  
 ejection fraction 40%  
 38  
 dobutamine poststress reinjection  
 201TI singlephoton emission computed tomogra -  
 phy(SPECT) akinesia severe hypo -  
 kinesia viability 가 . 10  
 ug/kg/min dobutamine wall thi -  
 ckening dobutamine vi -  
 able 169 dyssynergic seg -  
 ment 3  
 segmental wall motion  
 dobutamine  
 sensitivity 74%, specificity 95% , 201TI SPECT  
 sensitivity 89%, specificity 48%  
 201TI SPECT overestimation dobuta -  
 mine 가 .  
<sup>10)1)</sup> dobutamine  
 (myocardial contrast echocardiography), ra -  
 dionuclide imaging Nagueh <sup>10)</sup>  
 stable coronary artery disease  
 18 dobutamine  
 , radionuclide imaging  
 severe dysfunction 109  
 , thallium scintigraphy dobutamine

contractile reserve  
 sensitivity(89% to 91%) specificity  
 (43% to 66%) dobutamine  
 biphasic response sensitivity  
 68%, specificity 83% specificity가 가  
 . bip -  
 hasic response specificity가  
 . , Meza <sup>11)</sup>  
 가 39  
 dobutamine (2.5 20 ug/kg/min)  
 sonicated meglumine intracoronary injection  
 functional recovery 가 .  
 sensitivity 84%, specificity 19% to 26%;  
 dobutamine sensitivity 79% to 80%, sp -  
 ecificity 30% to 36% 가 combin -  
 ation sensitivity 90% to 93% specificity  
 48% to 50% .  
 dobutamine  
 115  
 70%, 79% , positive predictive  
 accuracy 67%, negative predictive accuracy  
 81% .  
 sensitivity가  
 가  
 . perfusion scan  
 hypoperfused perfusion  
 .  
 가  
 가  
 perfusion scan  
 low - dose dobutamine 가 high -  
 dose biphasic response  
 가 low - dose 5 ug/kg  
 /min biphasic response 가  
<sup>12)</sup> false negative

dobutamine  
 요 약  
 연구배경 :  
 가 가  
 가 가  
 dobutamine  
 방 법 :  
 1995 10 1997 5  
 ( )  
 dobutamine  
 23  
 1  
 20 , 3 , 44  
 73 61.2±9.0  
 13 , 13 , 3 ,  
 1 , 가 4 , 6 ,  
 15  
 2 6 , 3  
 13 , 2  
 가 1 3  
 가 3 ,  
 26% 58% 42.9±8.8%  
 16  
 3.3±0.7 7  
 가 3  
 1.7 . dobutamine  
 (baseline, 5, 10, 20 µg/Kg/min)  
 18.7±26.4 , 2  
 21 ( 9.0±6.2 )

16 se-  
 miquantitative scoring system(1 : normal, 2 : mild  
 to moderate hypokinesia, 3 : severe hypokinesia,  
 4 : akinesia, 5 : dyskinesia)  
 2  
 wall motion score 1  
 결 과 :  
 dobutamine  
 12 ,  
 10 ,  
 dobutamine  
 11 3  
 severe hypokinesia,  
 akinesia, dyskinesia  
 dobutamine  
 115 46 31 ,  
 69 13  
 dobutamine  
 dobutamine  
 70%, 79% , positive  
 predictive value 67%, negative predictive value  
 81% .  
 결 론 :  
 Dobutamine 가

중심 단어 : Dobutamine

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