

SCA 38

THE EFFICACY OF PREEMPTIVE MILRINONE IN PATIENTS UNDERGOING OPCAB: A COMPARISON BETWEEN LOW AND HIGH CARDIAC OUTPUT¹Kwak Y, ²Shim Y, ¹Lee J, ¹Kim S, ¹Hong Y¹Yonsei Cardiovascular Center, Yonsei University College of Medicine, Seoul, Korea; ²Yonsei University College of Medicine, Seoul, Korea

Background: Hemodynamic instability during coronary anastomosis is an important issue in managing patients undergoing off pump coronary bypass graft surgery (OPCAB). It has been known that milrinone increases cardiac output with minimal increase in myocardial oxygen consumption and baseline hemodynamics affects the response to milrinone treatment. This study was designed to compare the effects of milrinone on the changes in hemodynamics during OPCAB in two groups of patients with low and normal cardiac index (CI) preoperatively. Preemptive milrinone was infused continuously without bolus dose.

Methods: With IRB approval, 82 patients undergoing OPCAB were divided into two groups based on their pre-graft CI and each group was randomly subdivided into two groups to receive either milrinone or normal saline: low-CI (< 2.5 L/min/m²) with milrinone (G1, n = 20), low-CI without milrinone (G2, n = 20), normal-CI (≥ 2.5 L/min/m²) with milrinone (G3, n = 21), and normal-CI without milrinone (G4, n = 21). After internal thoracic artery harvest, milrinone at a dose of 0.5 /kg/min or normal saline was started and continued until the end of the anastomosis. Hemodynamic measurements were recorded after pericardiostomy (baseline), 5 min after the application of a tissue stabilizer at each coronary artery anastomosis and after sternal closure. Comparisons of the changes in hemodynamic variables among groups were performed with one-way ANOVA and mixed model analysis was used for the analysis of interaction effect between CI and milrinone. A P-value less than 0.05 was considered statistically significant.

Results: There was no significant difference in heart rates, systemic arterial pressure, pulmonary artery pressure, pulmonary capillary wedge pressure, and central venous pressure among four groups during and after the anastomosis. CI, stroke volume index (SVI) decreased more significantly in normal-CI group than in low-CI group regardless of the infusion of milrinone. Milrinone infusion successfully reduced the decrease in CI, SVI and SvO₂ in

low-CI group but not in normal-CI group during anastomoses. The interaction effect between CI and milrinone was significant in SvO₂ and left ventricular stroke work index.

Conclusions: Preemptive use of milrinone by continuous infusion before and during coronary artery anastomosis in patients undergoing OPCAB was effective in improving cardiac performance and preventing hemodynamic deteriorations in low cardiac output group but not in normal cardiac output group.

Reference: 1. Feneck RO. Intravenous milrinone following cardiac surgery: II. Influence of baseline hemodynamics and patient factors on therapeutic response. The European Milrinone Multicenter Trial group. J Cardiothorac Vasc Anesth 1992; 6: 563-7.

Table 1. Percent Changes in Hemodynamic Values*

		LAD	LCX	RCA	St.closure
CI	G1	116 ± 20	105 ± 22	122 ± 34	148 ± 40
	G2	108 ± 25	88 ± 24	119 ± 26	134 ± 32
	G3	90 ± 24* [†]	80 ± 17*	88 ± 20* [†]	97 ± 18* [†]
	G4	82 ± 16* [†]	72 ± 15*	69 ± 21* [†]	98 ± 24* [†]
SVI	G1	102 ± 21	91 ± 22	102 ± 29	117 ± 28
	G2	97 ± 16	83 ± 29	99 ± 26	111 ± 27
	G3	83 ± 21* [†]	72 ± 16	77 ± 20* [†]	83 ± 14
	G4	79 ± 17* [†]	69 ± 17*	61 ± 17* [†]	83 ± 19
SvO ₂	G1	96 ± 7	91 ± 9	94 ± 10	100 ± 12
	G2	90 ± 8*	82 ± 8	91 ± 11	96 ± 6
	G3	95 ± 5	85 ± 10	92 ± 8	94 ± 5
	G4	93 ± 6	85 ± 10	86 ± 12	92 ± 9
LVSWI	G1	95 ± 22	90 ± 28	102 ± 48	122 ± 36
	G2	88 ± 31	71 ± 23	88 ± 28	108 ± 26
	G3	71 ± 23*	67 ± 17*	72 ± 20	82 ± 19
	G4	73 ± 18*	68 ± 20*	60 ± 21*	89 ± 34

*; Values were calculated through dividing each measurement by baseline value, which is the measurement at pericardiostomy. LAD: at left anterior descending artery anastomosis, LCX: at left circumflex artery anastomosis, RCA: at right coronary artery anastomosis, St.closure: after sternum closure, G1: low cardiac index with milrinone, G2: low cardiac index without milrinone, G3: normal cardiac index with milrinone, G4: normal cardiac index without milrinone, CI: cardiac index (l/m²/min), SVI: stroke volume index (ml/m²/min), SvO₂: mixed venous oxygen saturation (%), LVSWI: left ventricular stroke work index (g.m/m²).

*; P < 0.05 compared with G1, †; P < 0.05 compared with G2.