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**EFFECTS OF MILRINONE DURING ANASTOMOSIS IN PATIENTS UNDERGOING OFF-PUMP CORONARY ARTERY BYPASS GRAFTING**

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**Background:** Hemodynamic deterioration during anastomosis is a main problem for off-pump coronary artery bypass graft surgery (OPCAB). Milrinone, the phosphodiesterase inhibitor has many theoretical advantages such as positive inotropic effect, prevention of arterial graft spasm and augmentation of mammarian blood flow, in patients with coronary artery disease. This study was designed to evaluate the effects of milrinone during anastomosis at which hemodynamic instability developed.

**Methods:** With IRB approval, thirty patients undergoing OPCAB were randomly allocated to the milrinone group (n=15) and the control group (n=15). Pulmonary artery catheter for continuous cardiac output monitoring and mixed venous oxygen saturation (SVO<sub>2</sub>) monitoring was inserted before anesthesia. In milrinone group, 0.5 µg/kg/min milrinone was started after internal mammary artery graft was harvested and continued until all graft anastomosis were completed. In control group, normal saline was infused. Hemodynamic measurements were recorded after pericardiostomy (baseline), 1, 3, 5, 10, and 15 min after the application of tissue stabilizer and after the removal of stabilizer during each coronary artery anastomosis. Vasopressors were used to maintain mean arterial pressure more than 60mmHg. Statistical analysis was performed with repeated measures of ANOVA and paired-t test, as appropriate and a P value less than 0.05 was considered as statistically significant.

**Results:** Cardiac output (CO), SVO<sub>2</sub> decreased significantly during anastomoses at all coronary artery territories in control group. However, in milrinone group, CO and SVO<sub>2</sub> were maintained consistently during anastomoses of left anterior descending (LAD) and right coronary artery (RCA) and SVO<sub>2</sub> decreased without decrease in CO during the anastomosis of left circumflex artery (LCX). Central venous pressure significantly increased in control group and heart rates significantly increased in milrinone group,

respectively. CO was significantly higher in milrinone group at 1 min after the application of stabilizer at all coronary artery than in control group. The amount of vasoconstrictors used and systemic arterial blood pressure were not significantly different between groups.

		Pericardiostomy	1 min	3 min	5 min	10 min	15 min	Stabilizer released
CO	LAD (C)	5.0 ± 1.2	4.7 ± 1.5*	4.3 ± 1.3*	3.8 ± 1.0*	3.9 ± 1.2*	3.7 ± 1.2*	3.6 ± 1.2*
	LAD (M)	5.0 ± 1.0	4.7 ± 0.9	4.4 ± 0.9	4.4 ± 0.8	4.4 ± 0.8	4.7 ± 1.0	4.9 ± 1.0
	LCX (C)	5.0 ± 1.2	3.7 ± 1.5*	3.8 ± 1.5*	3.2 ± 1.1*	3.1 ± 1.0*	3.1 ± 0.9*	3.3 ± 1.2*
	LCX (M)	5.0 ± 1.0	4.7 ± 0.8	4.0 ± 1.0	3.6 ± 0.8	3.6 ± 0.5	3.7 ± 0.9	3.8 ± 0.7
	RCA (C)	5.0 ± 1.2	4.3 ± 1.3*	4.0 ± 1.1*	3.9 ± 1.2*	3.5 ± 1.1*	3.6 ± 1.2*	3.8 ± 1.3*
	RCA (M)	5.0 ± 1.0	5.6 ± 1.3	4.9 ± 1.5	4.7 ± 1.5	4.4 ± 0.9	4.4 ± 0.9	4.5 ± 1.0
SVO <sub>2</sub>	LAD (C)	81 ± 8	75 ± 12*	74 ± 12*	72 ± 14*	73 ± 12*	72 ± 13*	73 ± 10*
	LAD (M)	79 ± 7	76 ± 6	75 ± 6*	75 ± 5*	76 ± 5	76 ± 5	77 ± 5
	LCX (C)	81 ± 8	69 ± 12*	67 ± 12*	66 ± 12*	67 ± 14*	66 ± 16*	69 ± 15*
	LCX (M)	79 ± 7	71 ± 10*	68 ± 10*	68 ± 9*	69 ± 9*	70 ± 10*	70 ± 7*
	RCA (C)	81 ± 8	74 ± 13*	72 ± 14*	72 ± 14*	70 ± 14*	69 ± 15*	71 ± 15*
	RCA (M)	79 ± 7	75 ± 10	73 ± 8	73 ± 8	73 ± 8	72 ± 8	74 ± 9

Values are mean ± SD. C: control group, M: milrinone group. CO : cardiac output, SVO<sub>2</sub> : mixed venous oxygen saturation.. LAD: left anterior descending artery. LCX: left circumflex artery. RCA: Right coronary artery. \* : P < 0.05 compared with value stabilizer exposed.

**Conclusion:** CO and SVO<sub>2</sub> significantly decreased immediately after the initiation of anastomosis and sustained during anastomosis. Milrinone infusion after LIMA harvesting without loading dose effectively prevented the decrease in CO and SVO<sub>2</sub> during anastomosis in patients undergoing off-pump CABG.

**Reference:** 1. Sha K, Shimoda T, Matsunori Y, Iwata M, Horiuchi T, Kurita N, Kitaguchi K, Hirai K, Furuya H, et al: Effects of amrinone in patients undergoing off pump coronary artery bypass grafting. Masui 2002 May; 51(5): 476-81.  
2. Yasuda, F, Shimono T, Cruz BP, Komada T, Onoda K, Tanaka K, Shimpo H, Yada I, Okuda M, Utsunomiya H, Maruyama K, et al: The effects of intravenous milrinone for the patient undergoing CABG. Kyobu Geka 2000 Feb; 53(2): 117-21.