

Effect of levosimendan compared to conventional inotropic agents on hemodynamics and outcome in patient with poor LV function undergoing cardiac surgery

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Abstract:

Introduction: Patients undergoing heart surgery involving cardiopulmonary bypass (CPB) experience global myocardial ischaemia with subsequent reperfusion which, despite cardioplegic protection, may result in different degrees of transient ventricular dysfunction. Levosimendan is a newly “calcium sensitizers”, it improves myocardial contractility by sensitizing troponin C to calcium without increasing myocardial oxygen consumption and without impairing relaxation and diastolic function.

OBJECTIVES: To evaluate the adding effect of new agent calcium sensitizer (levosimendan) compared to conventional inotropic and vasoactive agent used in patient with poor left ventricular function undergoing cardiac surgery on different measured hemodynamic variables and the effect on outcome.

Methods: Patients were divided into 2 groups of 30 patients each. The first Group received conventional inotropic and vasoactive treatment at different doses, while the other group received additionally levosimendan at loading dose of 6-12 mic/kg according to mean arterial pressure over 0.5 hr followed by 24 hrs infusion at 0.05 to 0.2 mic/kg/min. Hemodynamic data were collected at the end and at 30 minutes after CPB, thereafter at 6, 12, 24, and 36 hours post CPB. Mean arterial pressure (MAP), central venous pressure (CVP), heart rate (HR), mixed venous saturation (Svo₂), and base deficit (BD) were measured.

Results: Levosimendan had significantly improved postoperative hemodynamic values as in the mixed venous pressure at different times postoperative ($p < 0.05$), also the base deficit at different times postoperative ($p < 0.05$), while there was a significant reduction in systemic vascular resistance as decreased mean arterial pressure in levosimendan group compared to conventional group at 6 hrs postoperative mean 77.50 ± 10.81 vs 83.73 ± 10.81 with ($p = 0.029$), and at 12 hrs postoperative mean 77.37 ± 10.10 vs 84.23 ± 13.81 with ($p = 0.032$), and there was no significant difference in heart rate at different times postoperative between both groups ($p > 0.05$), while there was no significant effect on mortality between both groups ($p = 0.781$).

Conclusion: Levosimendan had improved hemodynamic parameters significantly with no effect on mortality compared to conventional inotropic agents in patient with poor left ventricular function undergoing cardiac surgery.

Keywords: Levosimendan, Cardiopulmonary bypass (CPB), Hemodynamics.