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112**The effects of levosimendan in cardiac surgery patients**

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Introduction: The aim of the study was to evaluate the effects of levosimendan, a new calcium sensitizer, used during cardiac surgery to facilitate separation from cardiopulmonary bypass (CPB) [1].

Method: Twenty ASA II–III patients, undergoing elective CABG, received, after the aortic clamp release, the same loading dose of levosimendan of 24 $\mu\text{g kg}^{-1}$ over 10 minutes, followed by a continuous infusion of 0.1 $\mu\text{g kg}^{-1} \text{min}^{-1}$ (group I, n = 10) or 0.2 $\mu\text{g kg}^{-1} \text{min}^{-1}$ (group II, n = 10). All patients had measured ejection fraction >25%, sinus rhythm, cardiac index (CI) >1.8 L $\text{min}^{-1} \text{m}^{-2}$, mean arterial pressure (MAP) >60 mmHg and pulmonary capillary wedge pressure (PCWP) 8–20 mmHg. They all received the same anaesthetic scheme. Cardiac output (CO) was obtained by Swan-Ganz catheter and thermodilution (Baxter-Edwards Lab). Haemodynamic measurements: Heart Rate (HR), MAP, PCWP, CO, CI, stroke volume (SV), systemic vascular resistance (SVR) were performed at: T₀: baseline, T₁ at 15 min after infusion, T₂ at 60 min, T₃ after 12 h and T₄ at 24 h after the end of infusion. Statistical analysis was performed by ANOVA for repeated measurements, P < 0.05 was considered significant.

Results: There were no significant differences in the demographic data. Haemodynamic results are shown in the table.

	Gp	T ₀	T ₁	T ₂	T ₃	T ₄
Heart rate (beats/min)	I	80 ± 2	78 ± 1.8	84 ± 3	84 ± 3.2	81 ± 3
	II	80 ± 3	89* ± 2.0	93* ± 4	94* ± 4	88 ± 3.8
Mean arterial pressure (mmHg)	I	85 ± 4	76 ± 3.8	73 ± 4	78 ± 5	78 ± 4.8
	II	82 ± 5	65* ± 5	73 ± 5	76 ± 5	74 ± 3.2
Stroke volume (ml)	I	55 ± 4	57 ± 4.2	58 ± 3.7	60* ± 5	58 ± 5.4
	II	56 ± 5.6	59 ± 7.1	60* ± 8.5	63* ± 9.9	59 ± 7
Cardiac index (L $\text{min}^{-1} \text{m}^{-2}$)	I	1.9 ± 0.3	2 ± 0.6	2.3* ± 0.6	2.5* ± 0.7	2.3* ± 0.4
	II	1.9 ± 0.6	2.2 ± 0.7	2.4* ± 0.7	2.6* ± 0.8	2.3* ± 0.8
PCWP (mmHg)	I	18 ± 4	12* ± 3	13* ± 5	13* ± 6	12* ± 4
	II	16 ± 3	11* ± 2.5	12* ± 4	12* ± 5	10* ± 5

*P < 0.05 in comparison to T₀

Conclusion: Both doses of levosimendan were effective, achieving a successful separation from CPB during the initial attempt. Levosimendan may offer an alternative inotropic therapy in patients following cardiac surgery. The effects of the drug were not abolished after terminating the infusion [2].

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084**Inhaled iloprost in the management of pulmonary hypertension in infants undergoing congenital heart surgery**

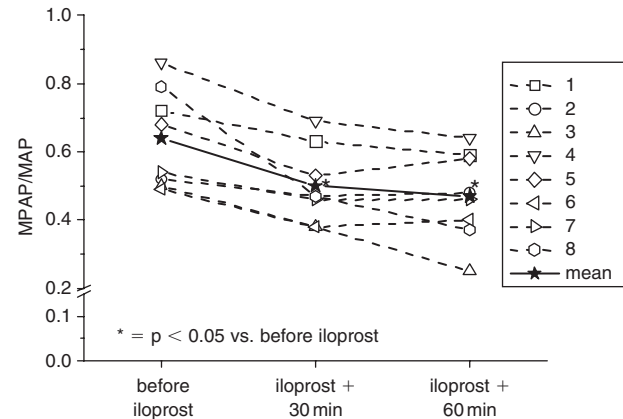
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Introduction: Impaired endothelium-dependant pulmonary artery relaxation is present in children with high pulmonary flow and pressure which might be exacerbated by cardiopulmonary bypass (CPB) [1]. The use of aerosolized iloprost has shown to be safe and effective in adults with pulmonary hypertension [2]. However, no data is available about the intra-operative use of inhaled iloprost in infants <1 year with pulmonary hypertension undergoing

Method: Eight infants with a median age of 6 months (range 3 days–8 months) undergoing cardiac surgery with CPB for congenital heart disease with increased pulmonary flow and/or increased pulmonary vascular resistance were included in this case-control-study. After weaning off CPB, infants with mean pulmonary artery pressure >15 mmHg received inhaled iloprost (2.5 $\mu\text{g kg}^{-1}$ over 15 min) using an ultrasonic nebulizer (Optineb®, Nebu-Tec, Eisenfeld, Germany). Mean pulmonary artery pressure (MPAP) and mean arterial pressure (MAP) were measured and the ratio MPAP/MAP was calculated before and 30 min and 60 min after starting iloprost inhalation. The need of vasoactive drugs after weaning off CPB was analysed. Repeated measures ANOVA with Tukey test was used to compare MPAP/MAP. P < 0.05 was considered significant.

Results: Mean MPAP/MAP decreased after inhaled iloprost from 0.64 ± 0.1 to 0.5 ± 0.1 at 30 min and 0.47 ± 0.1 at 60 min, respectively (P < 0.05). To keep MAP >45 mmHg a norepinephrine infusion was necessary in one patient. The individual courses of MPAP/MAP are demonstrated in the figure.



Discussion: A single dose inhaled iloprost decreases MPAP/MAP in infants after weaning off CPB by 21% and 25% after 30 min and 60 min, respectively. This indicates selective pulmonary vasodilating effects. However, vasopressor support was necessary in one infant. Although inhaled nitric oxide (iNO) is widely used to decrease pulmonary vascular resistance in infants undergoing cardiac surgery, the effects of iNO varies among patients, rebound phenomena have been described, and cumbersome devices are necessary to administer iNO safely. Inhaled iloprost may therefore be an alternative for selective pulmonary vasodilatation in infants undergoing cardiac surgery because it is effective, easy to use and long acting. Furthermore, from the economic point of view, inhaled iloprost may be attractive because iNO became very expensive after FDA approval.

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036**Incentive spirometry for preoperative preparation of cardiac patients**

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Introduction: Arterial hypoxaemia is not a rare complication of CABG. Incentive spirometry (IS) is a simple and low cost training method, which encourages an increase of lung volumes and inspiratory capacity. The purpose of the study was to investigate the efficiency of preoperative IS in CABG patients [1].

Method: The study included 65 randomly selected CABG patients 41 to 73 years of age. Patients were divided into 2 groups: patients of group S (37) used IS before surgery, group C (28 patients) were controls. IS was administered to group S patients for 2 days before surgery. Spirometry training was performed for 10 min each hour. Further, we started IS training at the second postoperative day. Anaesthesia and ventilation parameters were the same in both groups. Operative index, PaO₂/FIO₂ difference and O₂/O₂ were