INHALED AEROSOLIZED ILOPROST MITIGATES RESIDUAL PULMONARY HYPERTENSION AFTER PULMONARY THROMBENDARTERECTOMY

Eberle B1, Kramm T2, Guth S2, Mayer E2
Departments of Anesthesiology1 and Cardiothoracic & Vascular Surgery2, Johannes Gutenberg University Med School, Mainz, Germany

Chronic thromboembolic Hypertension (CTEPH) is treated surgically by pulmonary thrombendarterectomy (PTE). PTE is potentially curative but carries significant perioperative risk due to residual pulmonary hypertension and acute lung injury. Inhalation of aerosolized iloprost (i-ILO), a stable prostacyclin analogue, has been shown to improve hemodynamics and clinical status in primary and non-primary pulmonary hypertension (1,2), but failed to reduce pulmonary vascular resistance (PVRI) in a controlled study of preoperative CTEPH patients (3). This randomized controlled study assesses the effects of i-ILO upon hemodynamics and oxygenation in the early postoperative period following PTE.

Patients and Methods: With ethics committee approval/informed written consent, 22 CTEPH patients (56 ± 15 y; preoperative mean pulmonary arterial pressure 45 ± 14 mm Hg; pressure-constant ventilation, pro-pofol/sufentanil) received either aerosolized i-ILO 25 µg (group I, n=11) or normal saline (group P, n=11) following PTE and admission to ICU. Parameters of gas exchange, systemic and pulmonary hemodynamics prior to, during, and 90 min after inhalation were compared between groups.

Statistical analysis: Comparison of groups P vs. I for differences from pre-inhalation baseline; Mann-Whitney U test, significance at * p < 0.05, ** p < 0.01.

Results: There was a significant reduction of PVRI with i-ILO when compared to placebo for at least 90 min following inhalation. This resulted both from a sustained decrease of mean pulmonary arterial pressure (mPAP), or transpulmonary gradient, respectively, as well as from a more transient enhancement of cardiac index (CI) at 30 min after start of inhalation. Vasodilatory response to this dose of i-ILO (25 µg) was quite restricted to the pulmonary circulation. Oxygenation (PaO2/FIO2) remained unaffected.

Conclusion: In CTEPH patients, i-ILO elicits a marked vasodilatory response in the pulmonary vasculature immediately postoperatively after PTE, an effect not observed during preoperative steady-state anesthesia (3). This controlled study confirms the efficacy of i-ILO in the treatment of residual pulmonary hypertension in these postoperative patients at risk of PA rupture, right ventricular failure and reperfusion edema of the lung. Aerosolized iloprost is an additional tool to facilitate management of the early postoperative period after PTE.

References: