EP4_106

Acute Hemodynamic Response to Inhaled Iloprost (Ventavis™) in Patients with Pulmonary Hypertension Out of Proportion to Left Ventricular Filling Pressure

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Background:

There are well-documented hemodynamic and clinical benefits for pulmonary vasodilators in patients fulfilling accepted diagnostic criteria for pulmonary arterial hypertension (elevated pulmonary artery pressure with normal left ventricular filling pressures (LVFP)). It is less clear whether these medications should be used to treat so-called "out of proportion pulmonary hypertension" in patients with elevated LVFP. In particular, there is concern that pulmonary vasodilators will cause an increase in LVFP, leading to pulmonary edema. Methods: We have been using acute pulmonary vasodilator testing during right heart catheterization to evaluate the safety of these medications in patients with "out of proportion pulmonary hypertension". We report the acute hemodynamic response to inhaled iloprost (2.5 ugr. Ventavis™ delivered by an Omron™ MicroAIR™ U22 electronic nebulizer) of 37 patients with elevated pulmonary artery pressure (mean PAP≥25 mmHg) and elevated pulmonary artery occlusion pressure (mean PAOP≥16 mmHg).

Results:

Median age was 67 yrs. (range 29-89), with 35% males. Baseline hemodynamics, expressed as median (range), were as follow: mean PAP 49mmHg (26-67mmHg), mean PAOP 22mmHg (16-41mmHg), cardiac index 2.1 L/min/m^2(1.2-5.2 L/min/m^2), pulmonary vascular resistance (PVR) 5 L/min/mmHg (1-14L/min/mmHg). After inhaled iloprost, there was a significant decrease in mean PAP (median change vs. baseline -5 mmHg, range -32 to +5 mmHg, $p<0.0001$, paired t-test). There was no significant change in mean PAOP (median change vs. baseline 0 mmHg, range -19 to +12 mmHg, $p=0.39$). Although some patients had potentially significant increases in PAOP, none developed dyspnea in the hours after receiving iloprost. Mean systemic blood pressure (BP) measurements before and after inhaled iloprost were available for 20 patients. The median change in mean BP was -9 mmHg (range -46 to +12 mmHg). In all patients, mean BP after inhaled iloprost was within normal limits (range 75-122 mmHg), and no patients had symptoms or signs of hypotension.

Conclusions:

There is an acute modest decrease in PAP in response to inhaled iloprost in patients with elevated baseline PAP and elevated PAOP, which does not lead to clinically significant adverse hemodynamic effects although some patients experience a further increase of their already high PAOP. Further study will be needed to determine whether the acute response of PAP and PAOP predicts subsequent long term clinical behavior, vis a vis safety and efficacy, respectively.