Phosphodiesterase Type 5 Inhibitors Improve Right Ventricular Function and Pulmonary Compliance in Patients with Pulmonary Hypertension

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Background: Right ventricular function determines long-term prognosis in patients with pulmonary hypertension (PH). The effect of phosphodiesterase type-5 (PDE5A)-inhibitor therapy on right ventricular function in patients with pulmonary hypertension is unclear. We hypothesized that PDE-5-Inhibitor therapy increases right ventricular stroke work index (RVSWI) and pulmonary artery compliance (PC).

Methods: We retrospectively reviewed hemodynamic data on all consecutive PH patients treated with PDE5A-inhibitors as first line monotherapy who had a follow up repeat right heart catheterization (n=54). We evaluated the change in right RVSWI and PC before and after initiation of PDE5A-inhibitor monotherapy.

Results: Of the 56 patients, 29 patients had pulmonary arterial hypertension, 9 patients had PH secondary to left heart disease, 11 patients had PH due to lung disease, and 7 patients had chronic thromboembolic PH. The RVSWI (13.9 ± 6.2 vs. 13.3 ± 5.1 gm.m/m2/beat, P=0.61) of the total cohort did not change significantly after PDE5-Inhibitor therapy. However, RVSWI increased significantly after therapy in patients with poorest baseline right ventricular function (lowest tertile of baseline RVSWI) while patients with RVSWI in the 2nd or 3rd tertile had no change or a trend towards reduction in RVSWI after therapy. The improvement in RVSWI was mainly driven by an increase in stroke volume reflecting improved right ventricular function. The PC increased significantly (1.5 ± 0.7 vs. 1.7 ± 1 ml/mm Hg P=0.01) after PDE5-Inhibitor therapy. The increase in PC was associated with a decrease in pulmonary vascular resistance but not with a shift of the pulmonary vascular resistance-compliance curve.

Conclusions: PDE5A-inhibitor therapy increased right ventricular function in patients with PH and non-compensated right ventricular function. PDE5-inhibitor therapy improved PC.

Type: Clinical Category