Abstract: **P5022**

**Dual-energy CT was effective to evaluate of microvasculopathy in chronic thromboembolic pulmonary hypertension**

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**Topic(s):**
Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure – Diagnostic Methods

**Citation:**
Background: The existence of microvasculopathy in patients with chronic thromboembolic pulmonary hypertension (CTEPH) had been suggested. However, the impact of microvasculopathy for pathophysiology had been unknown. Recently dual-energy CT (DECT) can produce a sensitive iodine distribution map as blood perfusion in lung fields to quantify lung perfusion, also can suggest the existence of microvasculopathy according to poor subpleural perfusion which was published previously.

Methods: We retrospectively reviewed poor subpleural perfusion (defined as subpleural spaces either not or minimally perfused in all segments) and hemodynamics of 83 treatment-naïve CTEPH patients who underwent DECT from February 2014 to Jan 2019. Patients were divided according to poor subpleural perfusion: a microvasculopathy group (n=44) or a non-microvasculopathy group (n=39).

We assessed cardiopulmonary exercise test, right heart catheterization and DECT parameters as quantitative evaluation of pulmonary blood volume (PBV). PBV was calculated as the average of entire lung iodine density.

Results: PBV value in non-microvasculopathy group showed significant inverse correlation with pulmonary vascular resistance (PVR) (y = 14236 x-1.028 r = -0.530, p < 0.01).

PBV, SvO₂, and %DLCO/VA were significantly lower (22.0 vs. 26.4, p < 0.01, 61.3 vs. 66.0, p<0.01, and 59.2 vs 75.9 p < 0.01 ), and systolic pulmonary arterial pressure, PVR, VE/VCO₂ slope, BNP were higher (69.3 vs 60.6 p= 0.04, 834 vs 586 p < 0.01, 45.5 vs. 37.8, p=0.02, and 440 vs 122 p= 0.04) in microvasculopathy group, while the other parameters were similar between the two groups.

Multivariate analysis revealed that %DLCO/VA was the only predictor of microvasculopathy (OR,0.895 [95% CI, 0.835 - 0.960]; P< 0.01).

Conclusion: Pulmonary blood flow of patients in non-microvasculopathy group showed inverse correlation with PVR. DECT was effective to assess the microvasculopathy in CTEPH. In our experience, less than 60% of non-operable CTEPH patients have microvasculopathy.
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