

QUANTITATIVE PERFUSION LUNG SPECT: CORRELATION WITH ALVEOLAR VOLUME

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Introduction: Chronic obstructive pulmonary disease (COPD) may result in poorly perfused areas on perfusion single-photon emission computed tomography (SPECT). These areas are not included on SPECT measurements of perfused lung volume. On the other hand poorly ventilated areas are not included in volumes being measured by gas diffusion techniques. Purpose Our objective was to evaluate if the perfused lung volume correlates to alveolar volume measured by a single breath maneuver in smokers. Methods: A group of fourteen smokers was evaluated (8 male and 6 female; mean age 58 years, ranging from 31 to 80). Alveolar volume measured by single-breath maneuver during carbon monoxide diffusion test and lung volume derived from perfusion SPECT was recorded. Results: Nine patients had obstructive lung disease and 5 patients had restrictive lung conditions. Perfused lung volume derived from QPLS had a strong correlation with alveolar volume ($r = 0.871$, $p < 0.001$). Perfused lung volume was significantly smaller than alveolar volume (0.548 ± 0.608 ml, $p = 0.005$). Patients with restrictive lung conditions had smaller alveolar volume compared to the obstructive lung disease patients (1.733 ± 0.328 ml, $p < 0.001$). Perfused lung volume was also smaller in restrictive patients compared to obstructive lung disease patients (1.372 ± 0.158 ml, $p < 0.001$). Conclusion: Perfused lung volume strongly correlates with alveolar volume. A significant difference in lung volume between restrictive and obstructive lung disease groups was also detected.