

# DIFFUSING LUNG CAPACITY IN SARCOIDOSIS: A CORRELATION WITH SPIROMETRY DATA, TOTAL LUNG CAPACITY, RESIDUAL VOLUME AND CT SYMPTOMS

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*Abstract*

In comparison with static and forced lung volumes and capacities, lung diffusing capacity (DLCO) is more sensitive indicator for an assessment of lung function in sarcoidosis.

*Aim* — to study a correlation between DLCO spirometry parameters, total lung capacity, residual volume and CT symptoms in patients with pulmonary sarcoidosis.

*Materials and methods.* We examined 32 patients with pulmonary sarcoidosis (12 women and 20 men, age 22–66 years): newly diagnosed stage 2 sarcoidosis — 16, relapsing stage 2 sarcoidosis in active phase — 16. All patients underwent chest CT-scan using Aquilion TSX-101A scanner (Toshiba). CT images were processed and interpreted using K-Pasc software using diagnostic criteria by M. Veltkamp, J. C. Grutters (2014).

Lung function was assessed using spirometry, diffusing lung capacity and total lung capacity tests, performed on Diffustic™ (Geraterm Respiratory GmbH) diagnostic equipment. The following spirometry parameters were analyzed (% predicted): vital capacity (VC), forced vital capacity (FVC), forced expiratory volume in 1 sec ( $FEV_1$ ),  $FEV_1/FVC$  ratio (%), inspiratory capacity (IC). Total lung capacity (TLC) and residual volume (RV) were also analyzed. Diffusing lung capacity index was measured using single breath method. To reveal correlation between studied indices a Spearman's rank correlation coefficient was calculated (Rho). The results with  $p < 0,05$  were considered significant.

*Results.* A correlation study between DLCO and spirometry parameters, TLC, RV demonstrated a high (on the Chaddock scale) positive correlation between DLCO and TLC, IC (markers of restrictive disturbances) and an evident positive correlation between DLCO and  $FEV_1$ , VC, FVC. Evident positive correlation between DLCO and RV and  $FEV_1/FVC$  was also revealed. A correlation between DLCO and forced expiration parameters (FVC mainly), in our opinion, may possibly be determined by decreased static volumes and capacities due to restrictive ventilation disorders, as evidenced by a lowest Spearman's rank coefficient for the main indicator of bronchial obstruction  $FEV_1/FVC$ . No significant correlation was revealed between DLCO and lung CT symptoms, most likely due to imperfection and the influence of subjective judgement in quantitative assessment of CT symptoms.

*Conclusion.* Correlation between DLCO and static volumes and capacities may not be necessarily due to direct cause-and-effect relationship, but it could be used as the markers of the negative influence on lung gas exchange and as additional criteria for the effectiveness and the duration of the therapy.

**Key words:** pulmonary sarcoidosis, diffusing lung capacity, spirometry, total lung capacity, residual volume, CT symptoms, Spearman's correlation.

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