PERSPECTIVE

Diffusion lung capacity measurement in silicosis patients

Shawn Kruger

Kruger S. Diffusion lung capacity measurement in silicosis patients. J Chest Lung Res 2022; 3(4):25-6.

ABSTRACT

The transfer of gas from the air in the lung to the red blood cells in lung blood vessels is measured by the diffusing capacity of the lung which is also known as the transfer factor.

In this study, patients with simple and complex silicosis had their lung's ability to Diffuse Carbon Monoxide (DLCO) assessed. If any abnormal findings were found, they were correlated with the patient's computed tomography anomalies.

Keywords: *Fibrotic lung disease*

PERSPECTIVE

One of the most significant occupational diseases in the world, silicosis is a potentially fatal, irreversible, fibrotic lung disease that may develop after the inhalation of significant amounts of silica dust over time. The primary way of diagnosing silicosis, by the most recent International Labor Organization (ILO) recommendations, is by the evaluation of chest X-rays and a history of occupational exposure to silica dust. The three main types of silicosis are chronic, accelerated, and acute, based on various exposure intensities, latency times, and natural histories. Typically, 10 years or more of exposure to silica-containing dust precedes the development of the chronic or classic form.

Although rarely utilized as diagnostic tools, pulmonary function tests are frequently used in longitudinal studies of people with silicosis to evaluate functional decline in these patients. After spirometry and lung volumes, the single-breath Diffusion Capacity of Lungs for Carbon Monoxide (DLCO) is the pulmonary function test that is clinically the most valuable. Following occupational exposure to crystalline silica, several investigations have shown that patients with various radiographic lesions exhibit impaired pulmonary function. In patients with simple or complex silicosis, a high prevalence of dyspnea, restrictive restriction of lung function, and reduced diffusion capacity have been documented. Patients with silicosis also have impaired lung function, which is associated with aberrant radiological results on a Computed Tomography (CT) scan. It is crucial to establish the link between these two diagnostic methods because imaging and function tests are the most often utilized diagnostic tools in the follow-up assessment of people with silicosis. The purpose of this study was to evaluate the various degrees of radiological abnormalities on High-Resolution Computed Tomography (HRCT) scans of the thorax in patients with silicosis and, if any functional derangements existed, to assess them by measuring DLCO. The purpose of the study was to determine whether there was any relationship, if any, between DLCO and the severity of radiological abnormalities on the chest HRCT scan in silicosis patients.

The patients in this cross-sectional descriptive analysis had a history of occupational exposure to silica dust and had silicosis that had been radiologically established. Using the proper statistical formulae, the sample size was computed at a 95% confidence level. The sampling strategy was practical. Smokers who currently smoke and patients with silico-tuberculosis were excluded from this investigation. The total number of participants in the study was 56. The study's purpose was explained to participants, and their written informed consent was obtained. The institutional ethical research committee gave its approval to the study protocol.

Studies on silicosis patients have been conducted to examine the relationship between radiological abnormalities and lung function. With a low profusion category in uncomplicated silicosis and a higher prevalence of restrictive changes with increased profusion, both obstructive and restrictive patterns are reported regardless of smoking status. A statistically significant higher incidence of obstructive and mixed alterations was observed with PMF after adjusting for age, smoking, and length of exposure to silica. Even in the absence of smoking, the development of PMF is thought to be secondary to the occurrence of emphysema in silicosis. The author found that the level of pulmonary functions is determined more by the degree of emphysema than by the degree of silicosis. The ability to identify problems and provide extra information for early detection of minor opacities and emphysematous alterations is a key benefit of HRCT. There isn't much information about silicosis' CT appearance in radiological literature. The advantage of employing narrow CT slices in the transaxial plane, which reduces the superimposition of parenchymal structures, and allows for clear visualization of the distribution and severity of parenchymal alterations. When evaluating silicosis, a CT scan is superior to a chest radiograph because it can identify parenchymal damage. Prior research has not in-depth reported the existence of a significant relationship between the profusion of the parenchymal opacities assessed by HRCT and the DLCO.

Editorial office, Journal of Chest and Lung Research, United Kingdom.

Correspondence: Shawn Kruger, Editorial office, Journal of Chest and Lung Research, United Kingdom, e-mail: lungresearch@pulsusjournal.com

Received: 04 August 2022, Manuscript No. PULCLR-22-5285; Editor assigned: 05 August 2022, PreQC No. PULCLR-22-5285 (PQ); Reviewed: 26 August 2022, QC No. PULCLR-22-5285 (Q); Revised: 27 August 2022, Manuscript No. PULCLR-22-5285 (R); Published: 29 August 2022, DOI: 10.37532/pulclr.2022.3(4).25-6

The pulmonary alveolar macrophage and silica particles interact in the pathogenesis of silicosis. Other polymorph nuclear cells and extra macrophages are attracted as a result of the release of chemotactic and inflammatory mediators. This cascade causes fibrosis and chronic lung irritation as a result. In contrast to category 0 and 1 HRCT chest grading, we found impaired DLCO showing greater pulmonary vascular architecture distortion in categories 3 and 4. In conclusion, this study classified silicosis patients into distinct degrees of abnormalities based on nodules and emphysematous alterations on the HRCT chest. We also estimated DLCO in each patient for individualized grading of HRCT abnormalities and found a strong association between the two measurements. Reduced lung diffusion capacity in silicosis patients indicates reduced lung function, which is highly correlated with the number of nodules seen on radiological evaluation. We conclude that the HRCT chest is the most sensitive method to detect deterioration in DLCO at the early stage because it is superior to conventional chest radiographs and because we saw a strong link between changes in DLCO value and changes in HRCT grade.