

## Detection of alveolar epithelial injury by Tc-99m DTPA radioaerosol inhalation lung scan in rheumatoid arthritis patients

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Rheumatoid arthritis (RA) is a systemic autoimmune disorder primarily involving the joints. Lung alterations in RA may be primary or secondary to pharmacological treatments and may involve the alveoli, interstitium, airways and/or pleura. Technetium-99m diethylenetriaminepentaacetic acid (Tc-99m DTPA) aerosol inhalation scintigraphy is a sensitive and noninvasive test commonly employed to assess pulmonary epithelial membrane permeability. The purpose of this study was a) to investigate the changes of pulmonary alveolar epithelial permeability in patients with RA, b) to determine the relationship between the clearance rate of Tc-99m DTPA and pulmonary function test (PFT) results, and c) to determine the relationship between the clearance rate of Tc-99m DTPA and clinical parameters of disease. Twenty-five patients with RA but without lung alterations were included in the study. The patients were 22 females, and 3 males; mean age  $53.6 \pm 8.7$  years. Technetium-99m DTPA aerosol inhalation scintigraphy was performed on the study and healthy control groups. Clearance half times ( $T_{1/2}$ ) were calculated by placing a mono-exponential fit on the curves. Penetration index (PI) was calculated on the first-minute image. There were no significant differences in the mean  $T_{1/2}$  or mean PI values between the RA patients and control subjects. No correlation was found between the mean  $T_{1/2}$  values of Tc-99m DTPA clearance and activity of RA, clinical values, or the spirometric measurements except FEV<sub>1</sub>/FVC and functional status in RA patients ( $p = 0.02$ ,  $p = 0.01$ , respectively). However, a weak correlation was found between duration of disease and  $T_{1/2}$  values of Tc-99m DTPA clearance ( $p = 0.006$ ). PI values tended to correlate with FEF<sub>25–75</sub>, although, this was not statistically significant ( $p = 0.057$ ). This study shows that no changes occur in alveolar-capillary permeability in RA patients without lung alterations.

**Key words:** Tc-99m DTPA aerosol inhalation scintigraphy, clearance, rheumatoid arthritis, alveolar epithelial injury, pulmonary permeability