

The bronchoalveolar epithelial permeability in house painters as determined by Tc-99m DTPA aerosol scintigraphy

Meryem KAYA,* Ahmet SALAN,* Erhan TABAKOĞLU,** Nurettin AYDOĞDU*** and Şakir BERKARDA*

*Department of Nuclear Medicine, Trakya University School of Medicine

**Department of Chest Disease, Trakya University School of Medicine

***Department of Physiology, Trakya University School of Medicine

Purpose: Isocyanates are highly reactive chemicals used in a number of industries including paints. Therefore, house painters are known to be at risk for occupational exposure to isocyanates. Our objectives in this study were: (1) to investigate the possible effects of isocyanate exposition on the bronchoalveolar epithelial permeability in house painters by using Tc-99m DTPA radioaerosol lung scintigraphy; (2) to assess whether or not some differences exist between asthmatic and non-asthmatic house painters, and (3) to determine the relationship between Tc-99m DTPA radioaerosol lung scintigraphy and the spirometric measurements, and the work duration of house painters. **Materials and Methods:** Ten non-smoking house painters (28.8 ± 8.8 yrs) and ten healthy volunteers underwent Tc-99m DTPA radioaerosol lung scintigraphy. Following inhalation of radiotracer through a nebulizer for 5 minutes, dynamic scintigrams (1 frame/min, up to 10 min) were taken from both lungs. ROI's were drawn over the both lung area, and time-activity curves were obtained, from which the half-time ($T_{1/2}$) of Tc-99m DTPA clearance was calculated. Spirometric lung function test was measured in all house painters. **Results:** Mean $T_{1/2}$ values (min \pm SD) were 93.74 ± 32.79 for house painters, and 90.96 ± 40.02 for control subjects. There was no significant difference in $T_{1/2}$ values of Tc-99m DTPA clearance between house painters and controls, and between asthmatic and non-asthmatic house painters as well. No correlation was observed between $T_{1/2}$ values of Tc-99m DTPA clearance and spirometric measurements. In house painters, there was a positive correlation between $T_{1/2}$ values of Tc-99m DTPA clearance and work duration ($r = 0.73$, $p = 0.016$). **Conclusions:** Our findings indicate that in house painters, occupational exposure to isocyanates has no effect on bronchoalveolar epithelial permeability, and the rate of Tc-99m DTPA clearance shows no difference between asthmatic and non-asthmatic house painters. The positive correlation between the rate of Tc-99m DTPA clearance and work duration needs to be confirmed in larger cohorts.

Key words: house painters, Tc-99m DTPA aerosol scintigraphy, bronchoalveolar permeability