

Water-pipe smoking effects on pulmonary permeability using technetium-99m DTPA inhalation scintigraphy

Aysel AYDIN,* Goksel KITER,** Hatice DURAK,* Eyup Sabri UCAN,***
Gamze Capa KAYA* and Emel CEYLAN***

*Department of Nuclear Medicine, Dokuz Eylul University School of Medicine, Izmir, Turkey

**Department of Chest Diseases, Pamukkale University, Medical Faculty, Denizli, Turkey

***Department of Chest Diseases, Dokuz Eylul University School of Medicine, Izmir, Turkey

Objective: Although extensive work has been done on cigarette smoking and its effects on pulmonary function, there are limited number of studies on water-pipe smoking. The effects of water-pipe smoking on health are not widely investigated. The aim of this study was to determine the effects of water-pipe smoking on pulmonary permeability. **Methods:** Technetium-99m DTPA inhalation scintigraphy was performed on 14 water-pipe smoker volunteers (all men, mean age 53.7 ± 9.8) and 11 passive smoker volunteers (1 woman, 10 men, mean age 43.8 ± 12). Clearance half-time ($T_{1/2}$) was calculated by placing a monoexponential fit on the time activity curves. Penetration index (PI) of the radioaerosol was also calculated. **Results:** PI was 0.58 ± 0.14 and 0.50 ± 0.12 for water-pipe smokers (WPS) and passive smokers (PS) respectively. $T_{1/2}$ of peripheral lung was 57.3 ± 12.7 and 64.6 ± 13.2 min, central airways was 55.8 ± 23.5 and 80.1 ± 35.2 min for WPS and PS, respectively ($p \leq 0.05$). FEV₁/FVC% was 82.1 ± 8.5 (%) and 87.7 ± 6.5 (%) for WPS and PS, respectively ($0.025 < p \leq 0.05$). **Conclusions:** We suggest that water-pipe smoking effects pulmonary epithelial permeability more than passive smoking. Increased central mucociliary clearance in water-pipe smoking may be due to preserved humidity of the airway tracts.

Key words: water-pipe smoking, pulmonary function, technetium-99m diethylenetriamine-pentaacetic acid, inhalation scintigraphy