

ABSTRACT

Effect of Cement Dust on Pulmonary Function of Humans and Animals

Elaine Monica Davis

Environmental pollutants cause respiratory damage in humans (Thackrah, 1832). Studies show that persons working in dusty trades are at increased risk for lung pathology (Higgins and Cochrane, 1958), and heightened awareness of occupational diseases, encourages scientists to prevent potential dangers.

The fact that cement workers are repeatedly exposed to the pollutant For this thesis, studies were designed to determine impact of cement dust on lung function on workers and experimental animals, taking into account such variables as gender, ethnicity, tenure, smoking status and mask - wearing. Spirometric assessment was performed on 227 cement workers (using the 'only office' workers as controls), and morphohistofunctional studies on Sprague-Dawley rats exposed intranasally to cement dust in a specially designed chamber incorporating a built-in air circulation system.

Human results revealed that the majority of workers had restrictive lung disease (obstructive type expected with dusts) and only twenty two *per cent* of the sample had normal lung function. The control animals showed neither histopathological change nor compromised lung function. On the other hand the dusted rats showed significant lymphocytic infiltration of tracheal and bronchial walls, desquamation of the ciliated epithelium and evidence of depressed lung function.

The author postulates an Obstructive-Restrictive Conversion (ORCon) Concept to explain the prevalence of restrictive patterns seen in the cement workers, and the histofunctional changes observed in the rats.

The fact that cement workers are repeatedly exposed to the pollutant for prolonged periods would account for the conversion of obstructive to restrictive patterns over time, through gradual infiltration and damage to the lung parenchyma. Animal results suggest that the lung function decrement demonstrated in the dusted rats is mediated by histopathological changes resulting in impaired respiratory competence. Both findings are supported by The ORCon Concept.

Keywords: Elaine Monica Davis. Effect of cement dust on pulmonary function of humans and animals. Pulmopathology. The ORCon Concept. Restrictive lung disease. Cement Dust.