

Methacholine Challenge Testing in a Population with World Trade Center Dust and Fume Exposure and Persistent Respiratory Symptoms.

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Background: The destruction of the WTC on September 11, 2001 and the subsequent fires and cleanup resulted in massive exposures to dust, fumes, and gases for thousands of people including local workers and residents, clean–up workers, as well as rescue and recovery workers. The WTC Environmental Health Center is a treatment program designed to serve these diverse populations. Most individuals in the program continue to complain of persistent lower respiratory symptoms more than 5 years after exposure, however the mechanism of these symptoms is often elusive. We hypothesized that WTC–exposed individuals with normal spirometry but prolonged respiratory symptoms have persistent airway hyperreactivity (AHR).

Methods: Between October 2007 and June 2008 individuals with normal spirometry and any lower respiratory symptom (cough, shortness of breath, wheeze) were consecutively referred for methacholine challenge studies. A positive test was defined as PC₂₀ ≤ 4 mg/ml (ATS guidelines).

Results: Seventy–one subjects were referred for methacholine challenge; four did not complete the test and were excluded from analysis. A majority (52%) of those tested were positive. Subjects who tested positive were more likely to be female (p=0.001), and less likely to have complained of wheeze (p=0.005). Although spirometry values were normal, the presence AHR was associated with a reduced FEV₁ and trend towards higher reactance area measured during impulse oscillometry (IOS) (p=0.052).

Conclusion: Methacholine challenge suggests that WTC–exposed populations have persistent AHR years after exposure. Specific lower respiratory symptoms do not predict AHR but AHR may be associated with reduced spirometry values and elevated IOS.

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