For How Long is WTC Exposure Associated with Incident Airway Obstruction?

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INTRODUCTION: Adverse respiratory effects of work at the World Trade Center (WTC) disaster site have been widely documented and have shown consistent dose-response relationships. This study compares the number and timing of new cases of chronic obstructive airway disease (OAD) in highly-WTC-exposed versus lesser-WTC-exposed firefighters.

METHODS: New onset, chronic OAD was diagnosed by Fire Department of the City of New York physicians at treatment visits; individuals with a pre-9 November 2001 OAD diagnosis were excluded from analyses. Exposure was categorized by time of arrival for work at the WTC site as follows: (high) morning 9 November 2001 (n = 1,451); (moderate) afternoon 9 November 2001 or 9 December 2001 (n = 6,506); (low) 9/13–24/2001 (n = 1,083). We modeled relative rates of incidence with respect to exposure intensity over the first five years post-9 November 2001. We estimated the time(s) of changes in the relative rates from change point models using maximum likelihood. Models were adjusted for age on 9 November 2001, smoking history, retirement status, and season.

RESULTS: A change point in the relative rates was observed at 15 months post-9 November 2001. The relative incidence rate for the high versus low exposure group was 3.90 (95% CI 2.49–6.10) prior to 15 months and 1.79 (95% CI 1.28–2.48) thereafter. The trend from low to high exposure for the change in relative rates over time was significant (P < 0.001). Similar results were found in sensitivity analyses modeling OAD by subtypes (asthma and chronic bronchitis/COPD).

CONCLUSIONS: New post-9 November 2001 onset of chronic OAD is associated with WTC exposure for at least five years. There were higher rates of new-onset OAD among the most highly-exposed firefighters compared with the lowest-exposed group during the first 15-months and this association remained throughout the study period. This difference in new OAD diagnoses occurred despite full and equal access to healthcare throughout this time period. Our results suggest the persistence of WTC-associated risk of even late-diagnosed OAD.