CHEST Congress 2019 | Thailand Bangkok | 10-12 April

Disaster Medicine

CLINICAL BIOMARKERS OF WORLD TRADE CENTER AIRWAY HYPERREACTIVITY: A 16-YEAR LONGITUDINAL STUDY

S. KWON*[1] E. CLEMENTI[1] G. CROWLEY[1] T. SCHWARTZ[2] R. ZEIG-OWENS[2] M. LIU[3] D. PREZANT[2] AND A. NOLAN[1] [1]NEW YORK UNIVERSITY SCHOOL OF MEDICINE, MEDICINE, NEW YORK, NEW YORK, USA [2]FIRE DEPARTMENT OF NEW YORK, BUREAU OF HEALTH SCIENCES, BROOKLYN, NEW YORK, USA [3]NEW YORK UNIVERSITY SCHOOL OF MEDICINE, POPULATION HEALTH, NEW YORK, NEW YORK, USA

PURPOSE: Particulate matter exposure and metabolic syndrome (MetSyn) are known risk factors of airway hyperreactivity (AHR) and lung dysfunction. We investigate clinical biomarkers including those defining MetSyn as predictors of World Trade Center(WTC)-AHR in the Fire Department of New York World Trade Center(WTC)-exposed cohort.

METHODS: A cohort of male firefighters with $FEV_1 \geq LLN$ pre-9/11 that had serum drawn before site closure on July 24, 2002(N=7,486) was assessed, **Figure 1**. Cases of WTC-AHR(N=539) were identified if they had either a positive bronchodilator response or had a positive methacholine challenge(N=355). WTC-AHR were compared to N=6947 non-WTC-AHR. We modeled the ability of MetSyn at the first post-9/11 exam to predict WTC-AHR with Cox regression and adjusted for age and smoking status. We additionally examined leukocyte subsets as a comparison of a commonly associated marker of airway hyperreactivity.

RESULTS: WTC-AHR cases were older(40 vs 39), had higher BMI(29 vs 28 kg/m2), high intensity exposure(23% vs 16%), and more likely to have MetSyn compared to controls (20% vs 2%). There was a significant exposure dose response; the most highly exposed present in the morning of 9/11 had 2.24-fold increased risk of developing WTC-AHR. Having MetSyn increased risk of WTC-AHR by 65.4%($p<0.001$). Having at least 5% eosinophilia on first post-9/11 differential independently increased the risk of WTC-AHR by 83.8%($p<0.001$). Smoking history was not a significant risk factor in development of WTC-AHR.

CONCLUSIONS: Dyslipidemia, insulin resistance, and CVD biomarkers suggest that systemic inflammation can contribute to future airway hyperreactivity.

CLINICAL IMPLICATIONS: Further investigations assessing the impact of reversible MetSyn factors in AHR are needed.

DOI: https://doi.org/10.1016/j.chest.2019.02.134