

## Peripheral Eosinophils Are Associated With New Onset And Persistent Wheezing And Dyspnea In World Trade Center Exposed Individuals

**M. Maa**<sup>1</sup>, **A. Kazeros**<sup>2</sup>, **M. L. Turetz**<sup>3</sup>, **S. S. Parsia**<sup>4</sup>, **C. E. Caplan-Shaw**<sup>5</sup>, **D. Walter**<sup>1</sup>, **M. Liu**<sup>6</sup>, **L. Rogers**<sup>7</sup>, **M. Marmor**<sup>1</sup>, **J. Reibman**<sup>8</sup>

<sup>1</sup>New York University Medical Center & Bellevue Hospital, New York, NY, United States of America, <sup>2</sup>New York University Medical Center, New York, NY, United States of America, <sup>3</sup>New York University Langone Medical Center, New York, NY, United States of America, <sup>4</sup>NYU School of Medicine /, New York, NY, United States of America, <sup>5</sup>NYU School Of Medicine/Bellevue Hospital, New York, NY, United States of America, <sup>6</sup>New York University, New York, United States of America, <sup>7</sup>New York University School of Medicine, New York City, NY, United States of America, <sup>8</sup>New York University Medical Center /, New York, NY, United States of America

**Corresponding author's email: Ming-Tyh.Maa@nyumc.org**

**Rationale:** Eosinophilic inflammation is one component of the complex inflammatory response in asthma, and elevations in lung and peripheral eosinophils (eos) are reported in subpopulations with refractory asthma. Some exposed to World Trade Center (WTC) dust and fumes developed complex lung disease with many, but not all, having symptoms (sx) consistent with irritant-induced asthma. We hypothesized that persistent asthma-like sx in WTC-exposed individuals would be associated with systemic inflammation characterized by peripheral eos.

**Methods:** Individuals with physical sx occurring after WTC dust/fume exposure were self-referred to the WTC Environmental Health Center (EHC), a program for residents, local workers, and clean-up workers. All individuals underwent a standardized evaluation including blood work. There were 2461 individuals treated between 9/2005-3/2009. Individuals with respiratory sx or asthma diagnosis prior to 9/11, current tobacco use or a >5 p-y tobacco history were excluded.

**Results:** Analysis was performed on 1508 individuals who met inclusion criteria. Individuals had a mean age of 47 years, were mostly female (51%), and had a diverse race/ethnicity. Many (41%) were caught in the initial WTC dust cloud from the collapsing buildings. Respiratory symptoms that developed after WTC dust/fume exposure (new onset) and were present within the month preceding entry into the WTC EHC (persistent) included cough (55%), chest tightness (45%), wheeze (32%) and dyspnea on exertion (DOE; 26%). Both absolute and percent peripheral eos were elevated in patients with wheezing compared to those without ( $3.03 \pm 0.1$  vs  $2.42 \pm 0.1$  % eos, mean  $\pm$  SEM respectively,  $p < 0.0001$ ) Percent peripheral eos were elevated in patients with new onset and persistent DOE compared to those without DOE ( $2.75 \pm 0.01$  vs  $2.39 \pm 0.1$  % eos respectively ( $p < 0.004$ ). Additionally, FEV<sub>1</sub> was reduced in patients with  $\geq 4\%$  eos ( $n = 203$ ) compared to those with  $< 4\%$  eos ( $n = 1205$ ) ( $89.0$  vs  $93.0\%$  predicted FEV<sub>1</sub> respectively,  $p < 0.04$ ).

**Conclusions:** Peripheral eos were associated with specific respiratory sx of wheeze and DOE as well as reduced lung function in a diverse WTC-exposed population. These data suggest that eosinophils may participate in lung inflammation in this WTC exposed population with sx consistent with irritant-induced asthma.

This abstract is funded by: City of New York, CDC NIOSH 1E11OH009630