Occupational and Environmental Lung Diseases

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SESSION TYPE: Original Investigations
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SHORT-ACTING BETA-AGONISTS AND STEROIDS ARE ASSOCIATED WITH THE DEVELOPMENT OF AERODIGESTIVE DISEASE IN PARTICULATE MATTER-EXPOSED FIREFIGHTERS

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PURPOSE: World Trade Center (WTC)-PM exposure in firefighters contributed to the development of gastroesophageal reflux disease (GERD) and Barrett's Esophagus (BE). Often, these patients also have lung disease and are treated with inhaled medication such as short-acting beta-agonist (SABA), which could increase the risk of reflux. We previously showed in a pilot study that SABA use was significantly associated with GERD. Therefore, the purpose of this study is to validate the risk of medication use in patients with airway hyperreactivity (AHR) on development of GERD/BE in a cohort of WTC-PM exposed firefighters.

METHODS: Firefighters (N=4,151) consented for longitudinal monitoring in the WTC-health program. We included subjects that were **1.** recently consented **2.** had normal lung function before 9/11/2001 **3.** exposed to the WTC site within two weeks of 9/11/2001 **4.** had first post-9/11 serum drawn before site closure on 7/24/2002 and **5.** had all serum variables measured. Electronic Medical Record (EMR) was reviewed for pulmonary function testing, medical diagnoses, and medication history. GERD (N=2,515) was defined on EMR diagnosis and/or proton pump inhibitor, H_2 blockers, antacid, or surface agent use; BE (N=425) was defined on EMR diagnosis alone. AHR (N=1,420) was identified based on positive methacholine or bronchodilator testing and/or EMR diagnosis. Steroid use was identified by any use of either prednisone or dexamethasone. All analysis and database management occurred using SPSS 28. Logistic regression was used to evaluate associations of respiratory medications and GERD/BE.

RESULTS: Demographics. Male firefighters, of which N=3,908 were Caucasian, had a mean age of 39 years at 9/11/01. Cigarette use in the overall population was N=1309, of which N=783 had GERD, N=150 had BE. N=443 GERD were exposed to WTC site in the morning on 9/11, N=1,393 arrived at the site in the afternoon, and N=679 after 9/12.

Medication Use. N=1,109 GERD and N=150 BE were on SABA while N=609 GERD and N=124 BE were on steroids. SABA and steroid use was associated with increased odds ratio (OR; [95%CI]) of developing **1.** GERD by 4.10[3.52-4.78] and 4.69[3.77-5.83]; **2.** BE by 1.99(1.63-2.44) and 2.30(1.83-2.89), respectively, after adjusting for age and smoking ($p<0.001$). Subjects with WTC site arrival time in the morning of 9/11 had 34.8% higher risk of developing GERD, compared to 28.8% higher risk in those who arrived in the afternoon of 9/11. Subjects had a 41.0% higher risk of developing BE if they arrived on the morning of 9/11 compared to 31.7% risk if they arrived in the afternoon.

CONCLUSIONS: In a population with high PM exposure, treatment of respiratory disease with SABA and steroids can increase risk of GERD. A defined sub cohort are currently being enrolled in our observational study investigating noninvasive biomarkers of GERD/BE and airway hyperreactivity (clinicaltrials.gov #NCT05216133).

CLINICAL IMPLICATIONS: Further investigation into overlap of GERD/BE and AHR can help distinguish phenotypes of disease. Future studies will include further assessment of other inhaler use and aerodigestive disease and analysis of serum biomarkers predictive of GERD and BE.

DISCLOSURES:

No relevant relationships by George Crowley

No relevant relationships by Urooj Javed

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