# Biomarkers Of Gerd And Barrett's Esophagus In World Trade Center-Exposed Fire Department Of New York City Rescue Workers: The Aerodigestive Continuum

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**Introduction:** Our group has published extensively on firefighters who were exposed to World Trade Center dust on 9/11/2001. Approximately 9000 firefighters have had serum drawn immediately post 9/11 as part of the World Trade Center (WTC) Medical Monitoring and Treatment Program(MMTP), and followed longitudinally. Many of these individuals developed cough, and pulmonary disease, and were treated with bronchodilators. The cohort continued to develop exposure-related diseases, including GERD and Barrett's, a pre-neoplastic manifestation. Since the use of beta-agonists can confound the developement of GERD in those with lung disease it was also quantified. This study focuses on predictive serum biomarkers of GERD and Barrett's. We also investigate the relationship between GERD/Barrett's and lung disease.

**Methods:** Electronic medical records were used to identify those with incident GERD, Barrett's and of short-acting and long-acting beta-agonists (SABA and LABA) use in a population of never smokers with pulmonary complaints. Serum was analyzed on a subpopulation (N=327) representative of the cohort stratified on BMI and lung function using Luminex for 131 analytes. Pearson Chi-square test was used to determine associations between SABA/LABA use and aerodigestive disease. Multinomial regression was used to identify analytes that could predict GERD and/or Barrett's compared to controls without GERD/Barrett's, taking age, BMI, and exposure intensity into account.

**Results:** Lung function ($FEV_1$) at the time of presentation to subspecialty pulmonary evaluation was no different in those with GERD or Barrett's compared to controls. SABAs was significantly associated with GERD, but not Barrett's (Pearson's Chi-square). In a multinomial regression adjusted for age, BMI, and exposure, SABA use was not a significant predictor. C-peptide and Insulin predicted GERD as continuous variables. CRP, Fractalkine, G-CSF, Insulin, IP-10, and Triglyceride significantly predicted Barrett's. Cutpoints were optimized in this population to determine clinically useful levels. ORs are shown in Figure 1 with 95% Confidence intervals.

**Conclusion:** Similar to other studies, our population shows that there is an association between SABA use and GERD. However, there is no increased incidence of Barrett's associated with SABA use. We demonstrated that the metabolically active mediators, insulin and triglycerides, have a strong association with GERD and Barrett's. This pilot study frames future studies to further our understanding of aerodigestive pathology due to particulate exposure.