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D55. RESPIRATORY HEALTH OUTCOMES OF WORLD TRADE CENTER EXPOSURES 18 YEARS LATER

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D55 RESPIRATORY HEALTH OUTCOMES OF WORLD TRADE CENTER EXPOSURES 18 YEARS LATER / Thematic Poster Session

Association of Endogenous Secretory RAGE and World Trade Center Particulate Matter-Induced AHR and Lung Injury

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RATIONALE. World Trade Center (WTC)-particulate matter (PM) exposed firefighters have developed airway hyperreactivity (WTC-AHR) and lung injury (WTC-LI). Risk factors of WTC-AHR/LI include metabolic syndrome (MetSyn) and serum soluble receptor of advanced glycation endproducts (RAGE). RAGE not only has many ligands but also has many biologically active isoforms which are mediators of MetSyn related disease. One isoform of interest is endogenously secreted RAGE (esRAGE), which has been inversely associated with body mass index (BMI) and MetSyn. Therefore, our objective was to quantify esRAGE in cases of WTC associated LI and AHR. **METHODS.** For our pilot study, we assayed serum samples of WTC-exposed male firefighters with either AHR, WTC-LI or normal pulmonary function from a randomly selected representative 10% cohort control (N=449/4,487), Figure 1A. Cases of AHR (N=21) had positive methacholine and/or bronchodilator response, and FEV₁>LLN at WTC-HP entry, whereas N=85 cases of WTC-LI had FEV₁≤LLN at WTC-HP entry. Age and BMI-matched cohort controls (N=41) and WTC-LI (N=24) were selected in a 1:1:2 ratio (AHR: WTC-LI: control). Available serum aliquots drawn at WTC-HP entry were assayed for esRAGE (B-Bridge International). AHR were compared to non-AHR/WTC-LI controls enriched with WTC-LI cases, whereas WTC-LI cases were compared to non-AHR/WTC-LI controls enriched with AHR cases. Fold change over mean concentration of control was calculated and compared by student t-test (SPSS 23). **RESULTS.** WTC-LI cases had significantly higher triglycerides compared to cohort controls (mean 197.0mg/dL v 163.4mg/dL respectively), whereas AHR cases were no different. WTC-LI/AHR were not significantly different compared to cohort controls in smoking, exposure intensity, and FEV₁%pred at WTC-HP entry by student t-test. WTC-LI/AHR cases were also not different in blood pressure, cholesterol, LDL, or HDL at WTC-HP entry. WTC-LI and AHR cases also expressed different patterns of esRAGE expression, Figure 1B. WTC-LI cases had a decreased expression of esRAGE (0.7806; p<0.01) whereas AHR had increased relative expression (1.1195; (p<0.01) compared to cohort controls. **CONCLUSIONS** WTC-LI and AHR express different patterns of esRAGE. While esRAGE level is positively associated with AHR in our cohort, it is negatively associated with WTC-LI. This suggests that esRAGE could mediate different pathways of inflammation leading to lung disease. Future work will focus on validating our pilot study results in the cohort control. <!--EndFragment-->