039: Decreased levels of serum club cell 16 among non-seroatopic children with exercise-induced wheeze.

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BACKGROUND

- Among urban children in 3 independent study cohorts, we have observed associations between exercise-induced wheeze (EIW) and urgent medical visits for asthma, independent of allergic sensitization and asthma severity.[1,2]
- Inhalation of environmental pollutants increases oxidative stress in airways and enhances exercise-induced bronchoconstriction responses.[3]
- Club cell 16 (CC16), abundant in lung lining fluid and measurable in serum, has anti-oxidant and anti-inflammatory roles, and oxidant rich-pollutants decrease CC16.[4]

METHODS

- For the NYC Neighborhood Asthma and Allergy Study, asthmatic (case) and non-asthmatic (control) 7-8 year-old children living among NYC neighborhoods with higher and lower asthma prevalence were recruited (n=347, Figure 1)
- Serum CC16 was measured (R&D Systems, Minneapolis, MN) in 277 children.
- Seroatopy was defined as IgE to common inhalant allergens.

Figure 1. NYC Neighborhood Asthma and Allergy Study. Dots represent study subjects. Neighborhood asthma prevalence among 5 year olds (NYC DOHMH).[5] Reproduced from.[6]

REFERENCES

1. Mainardi et al. Pediatrics 2013;131:e127-35.
2. Savary KW et al. Ann Allergy Asthma Immunol 2018; 120:278-84 e2.
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4. Laucho-Contreras et al. Expert Poin Ther Targets 2016;20:869-883.

HYPOTHESIS

Serum CC16 would be inversely associated with reported EIW.

RESULTS

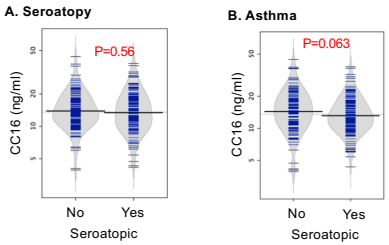

Figure 1. Serum CC16 stratified by A) seroatopy and B) asthma.

- CC16 serum concentrations were not statistically significantly different between children with and without asthma symptoms or seroatopy (Figure 1).
- Overall, there was a positive association between CC16 and FEV1/FVC; however, this association was observed among seroatopic but not in non-seroatopic children (Figure 2).
- Among the children with asthma symptoms, in models adjusting for sex, race, Hispanic ethnicity, maternal asthma and environmental tobacco smoke, CC16 was inversely associated with exercise-induced wheeze among non-seroatopic, but not among seroatopic children (Figure 3).
- CC16 was not different (P>0.6) among children with more vs. fewer asthma symptoms (i.e., increased severity).

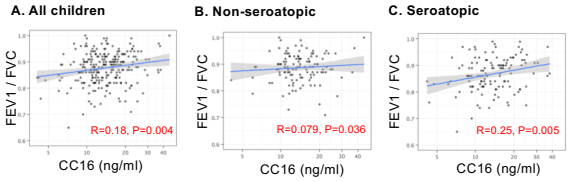

Figure 2. Correlation between serum CC16 and FEV1/FVC among A) all children, B) children without seroatopy and, C) children with seroatopy.

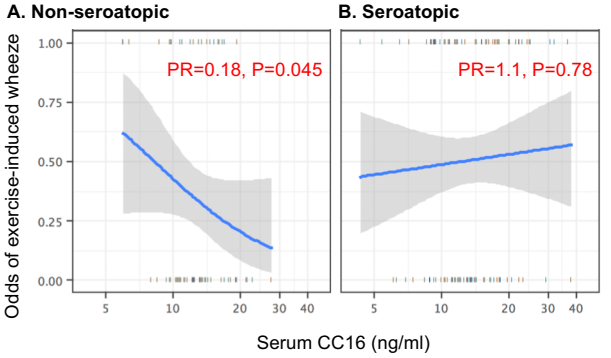

Figure 3. Odds of exercise-induced wheeze with serum CC16, stratified by seroatopy status among asthmatic children. Blue lines represent odds and gray area represent 95% confidence intervals for bivariate models. Prevalence Ratio (PR) adjusted for sex, race, Hispanic ethnicity, maternal asthma and environmental tobacco smoke.

CONCLUSIONS

Among non-seroatopic children with asthma symptoms living in an urban environment, CC16 levels were lower among children with EIW, but were not associated with asthma severity, potentially suggesting a role for a decreased oxidative stress response in non-allergic pathways to EIW.

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