Quantity of Rhinovirus in Nasal Lavage Does Not Predict Illness Severity

JD Bufford, KA Roberg, TE Pappas, RF Vrtis, C Tisler, E Anderson, D DaSilva, MD Evans, RE Gangnon, RF Lemanske Jr., JE Gern, University of Wisconsin School of Medicine and Public Health

RATIONALE: Moderate to severe rhinovirus (HRV) illnesses in infancy are associated with increased risk of wheezing at age 3. Determinants of illness severity remain unknown. We hypothesized that severe illnesses would be associated with more HRV in the upper airway than less severe illnesses.

METHODS: Nasal lavage samples and symptom scores were obtained at regular intervals and at sick visits from 285 children in the Childhood Origins of Asthma study (COAST). Samples were tested for HRV by Respiratory Multicode Assay. Quantitative PCR for HRV was performed on HRV(+) samples from 31 subjects who had 5 or more illnesses in the first year of life.

RESULTS: Although median values of HRV were greatest during severe illnesses, there were no significant differences between the asymptomatic (n=18), mild (n=15) or severe illnesses (n=62) (6,664 vs. 21,070 vs. 61,633 copies, p=0.229). There was a trend towards a positive correlation between symptom score and HRV quantity (r=0.177, p=0.086) and a significant inverse correlation between age and HRV quantity (r=-0.284, p=0.005). Boys had higher quantities of HRV than girls (57,756 vs. 12,073 copies, p=0.057). Exclusive breastfeeding vs. formula feeding during the first 2 months of life and daycare attendance and parental smoking at age 1 did not influence HRV quantity.

CONCLUSIONS: Age and sex may be predictors of the quantity of HRV in nasal lavage during infection; however, the association between virus quantity and illness severity is not as predictive. These findings suggest that there are additional factors related to virus pathogenicity or host defense that contribute to illness severity.