ASSOCIATION BETWEEN STAPHYLOCOCCUS AUREUS IN THE HOME ENVIRONMENT AND DECREASED LUNG FUNCTION IN ASTHMATIC CHILDREN IN BARBADOS

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Background and Aims. Staphylococcus aureus, a gram-positive bacterium, can survive in the environment for weeks to months. While asthma is a known risk factor for nasal colonization with methicillin-resistant Staphylococcus aureus (MRSA), less is understood about potential associations between S. aureus environmental exposure and asthma symptoms. We adapted culture methods for MRSA and methicillin-susceptible S. aureus (MSSA) to the household setting and estimated associations between measures of lung function in asthmatic children and household S. aureus environmental positivity.

Methods. We sampled surface dust from a subgroup of 19 children enrolled in a pilot childhood asthma study in Barbados during July 2010. Children and their families recorded twice-daily FEV1 measures using a personal PIKO instrument for five days. Concurrently, we sampled a common room surface and the child’s pillow in each home using sterilized dry electrostatic cloths, which we cultured using single-enrichment (MSSA) and double-enrichment (MRSA) protocols. We confirmed suspect S. aureus colonies by real-time PCR methods for femA (MSSA), and mecA (MRSA) gene presence.

Results. Eight of 19 households (42%) were positive for MSSA (4) or MRSA (4). Pillows were the location most often positive (7 of 8 households). Average child age was 11 years (range: 6-17). Mean FEV1 was 1.60 [95%CI: 1.15-2.06], accounting for within-child correlation. S. aureus household positivity was associated with a 0.43 unit decrease in log FEV1 measures in asthmatic children, controlling for within-child correlation of measurements over time (p=0.02). Age was a significant confounder and attenuated the estimate to a 0.20 unit decrease (p=0.07).

Conclusions. Among children with asthma in Barbados, S. aureus in the home environment was associated with lower lung function. While this study did not assess S aureus nasal colonization in asthmatic children, future research using a larger cohort to investigate the link between S. aureus exposure and asthma outcomes is warranted.