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| **The AERIAL birth cohort: viral susceptibility and recurrent wheezing within the first year of life** |
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| **Introduction/Aim:** Recurrent wheezing disorders are extremely common and impose significant burdens on children, families, and healthcare systems, with the respiratory epithelium playing a key mechanistic role. We designed the AERIAL birth cohort to characterise the association between epithelial dysfunction at birth and future wheezing morbidity. Here, we aim to identify clinical factors in the first year of life associated with susceptibility to viral illness and recurrent wheezing development.**Methods:** The AERIAL birth cohort is nested within the ORIGINS Project, a large Western Australian prospective study, and will follow 480 infants from birth to 5 years of age. Pregnancy, family, and child health data were obtained from ORIGINS. Symptomatic respiratory illnesses were captured through daily use of the AERIAL smartphone app. Nasal swabs for respiratory virus testing (Western Diagnostics) were collected during symptomatic illnesses and at 3-monthly background visits. Recurrent wheezing was defined as more than 2 episodes of parent-reported wheezing in the first year of life. Risk factors for recurrent wheezing were identified by multiple logistic regression, while risk factors for early viral infection (time to first respiratory virus) were identified using cox regression.**Results:** 393 participants had turned one through September 1st, 2023. 436 symptomatic and 219 asymptomatic virus events were detected. The median number of viruses detected per child was 2 (range 0-8). 77 children (19.6%) developed recurrent wheezing. From the multivariate model, recurrent wheezing was significantly associated with a shorter time to first virus, childhood allergies, and having a mother with asthma (p-values<0.05). From the cox model, recurrent wheezing diagnosis, large family size, and a lack of maternal influenza vaccination during pregnancy were significantly associated with a shorter time to first virus (p-values<0.05).**Conclusion:** These data support our hypothesis that some children are born with an inherent vulnerability to viral infection and recurrent wheezing.**Grant Support:** This work was supported by a grant from the National Health and Medical Research Council of Australia (NHMRC115648). |