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Early-life allergic sensitization and respiratory infection–Two hits on lung function?

Background

Allergic sensitization and respiratory infections are both common in childhood. Interplay between them in asthma development has been referred to as the ‘two-hit’ hypothesis. There has however been no previous investigation of this on adult lung function

Objectives

In a birth cohort at high risk for allergic diseases, we investigated for interactions between these two factors and lung function outcomes into adulthood.

Methodology

Allergic sensitization was assessed at age 24 months by skin prick testing to aero and food allergens. Respiratory infection was defined as cough, rattle or wheeze measured by frequent questionnaires up to age 24 months. Regression models were utilized to identify interactions between these exposures and associations with lung function at ages 12, 18 and 25 years.

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Results

At age 25 years, those sensitized at age 2 years(n = 118) demonstrated reductions in pre-bronchodilator FEV_1 of 0.06 z score units (95% CI: −0.12, 0.00, , p = .055) for each additional month of respiratory infections. Those not sensitized (n = 120) had increases in pre-bronchodilator FEV_1 of 0.07 z-score units (95% CI: 0.02, 0.13, , p = .012) for each additional month of respiratory infection($p_{interaction}$ = .012). Similar findings were observed for FEV_1/FVC ratio($p_{interaction}$ = .011), FEF_{25-75}($p_{interaction}$ = .007) and absolute change in pre and post bronchodilator lung function. At age 18 years, findings were similar; however, there was less evidence for interactions at age 12 years.

Conclusion

Our study findings support the 'two-hit' hypothesis of interactions between early-life allergic sensitization and increasing respiratory infections, and impairment in lung function up to age 25 years. Early childhood respiratory infections however had differential impacts on lung function depending upon the presence or absence of allergic sensitization.

Keywords: allergic sensitization, early-life, interaction, lung function, respiratory infection, two-hit

Biography

Vikas Wadhwa is Medical Director of Ambulatory Services at Peter Mac. He is Clinical Associate Professor at the University of Melbourne.and fellow of the Royal Australasian College of Physicians and the Royal Australasian College of Medical Administrators. He holds a Senior Executive MBA, MPH and MClinMed and is currently completing his PhD in Respiratory Medicine at The University of Melbourne.Vikas Wadhwa is published in various medical journals and has also attended and presented his research at scientific meetings in the field of General, Respiratory and Sleep Medicine.

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