



POSTER PRESENTATION

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Association of parental FEF_{25-75%} during a methacholine challenge and children's PC₂₀ and diagnosis of asthma

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Background

There is evidence that paternal and maternal lung function influence children's pulmonary function. To date, the most widely used pulmonary function test (PFT) to assess airway responsiveness is the PC₂₀ (concentration of methacholine required to decrease FEV₁ by 20%). However, other measures of parental lung function may be better predictors of airway responsiveness or asthma development in their children.

Methods

The study population included children born in 1995 in Manitoba, who were enrolled in a nested case-control birth cohort study (Study of Asthma Genes and the Environment (SAGE)). Both index children and their parents underwent PFTs and methacholine challenges to determine their PC₂₀. Parents often had a normal PC₂₀ but a change in flow at mid-lung volumes (forced expiratory flow at 25-75% vital capacity) was noted. Therefore, we measured parental PC₃₀ (concentration of methacholine required to decrease FEF 25-75% by 30%) and its association with their child's PC₂₀ and physician diagnosed asthma. A positive PC₃₀ was measured at a concentration of ≤ 8 mg/ml. Children were assessed at age 12-13 by a pediatric allergist for a diagnosis of asthma. Odds ratios (OR) were calculated to examine the relationship between parental PC₃₀ and a child's PC₂₀ and asthma. This relationship was further explored by gender.

Results

Overall 114 children and their parents were included in this analysis. Of the 114 children, 47 were females (21

asthma) and 67 were boys (23 asthma). No significant relationship was seen between children diagnosed with asthma and having a parent with a PC₃₀ ≤ 8 (OR 1.07; 95% CI 0.49-2.37) or both parents PC₃₀ >8 .

112 children [45 females (23 with PC₂₀ ≤ 8) and 67 males (46 with PC₂₀ ≤ 8)] fit the criteria for having a PC₂₀ and participating parents. In children with a PC₂₀ ≤ 8 there was no relationship between having one parent with PC₃₀ ≤ 8 (OR 1.18; 95% CI .54-2.63) or both parents having a PC₃₀ >8 .

When we examined gender specific relationships, there was no association between fathers PC₃₀ and having a son diagnosed with asthma (OR 1.32; 95% CI 0.5-3.5) or daughters with a diagnosis of asthma (OR 1.07; 95% CI 0.33-3.48). Similarly, there was no significant association between the father's PC₃₀ and their child's PC₂₀ being ≤ 8 mg/ml.

In moms with a PC₃₀ ≤ 8 mg/ml there was no association with sons that had a PC₂₀ ≤ 8 mg/ml (OR 1.0; 95% CI 0.51-2.0); However moms with a PC₃₀ ≤ 8 were significantly more likely to have a daughter with a PC₂₀ ≤ 8 (OR 3.56; 95% CI 1.55-8.21). In addition, there was a significant relationship between mom's PC₃₀ being ≤ 8 and a daughter having physician diagnosed asthma (OR 2.34; 95% CI 1.04-5.44). The relationship was in the same direction between maternal PC₃₀ and a son's diagnosis of asthma, however this was not significant (OR 2.0; 95% CI 0.99-4.05).

Conclusion

There was no relationship between children's asthma and PC₂₀ and parental airway responsiveness measured as PC₃₀. There was a statistically significant relationship between daughter's airway responsiveness and asthma and mothers' airway responsiveness as a PC₃₀ FEF 25-75%.

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Maternal mid-flow responsiveness may be helpful in identifying risk for the development of pediatric asthma. Mid lung flow changes in mothers may represent a maternal genetic influence on the development of asthma in children.

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