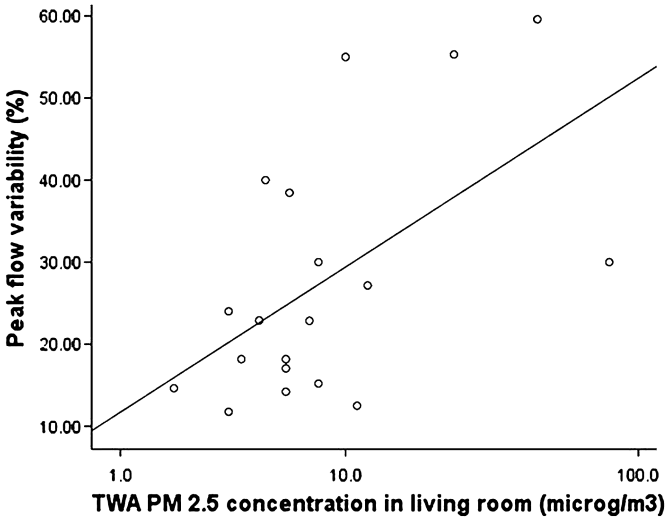
Methods Children with asthma were recruited. Disease severity was determined by questionnaire and spirometry. Asthma control was assessed by 5-day peak flow variability and children's asthma control test (CACT) on the first and fifth day of peak flow testing. Concentrations of $PM_{2.5}$ were measured over a 24-h period in the living room and the child's bedroom.

Results 22 children were recruited, mean age 11.0 years. Across the 22 homes the median time weighted average (TWA) $PM_{2.5}$ concentration (range) in the living room was 7.4 mg/m3 (2.0–150.0) and for the bedroom was 5.6 (3.1, 11.1) mg/m^3 (p=0.04 for comparison with living room). As expected, there was a significantly higher mean TWA $PM_{2.5}$ in the living rooms and bedrooms of the seven homes where smoking was reported; 22.0 mg/m^3 for living rooms in smoking homes and 4.7 mg/m^3 for non-smoking homes, p=0.001. There was a positive association between TWA $PM_{2.5}$ in the living room and peak flow variability (r=0.51, p=0.027, see Abstract P77 Figure 1) and a negative association between TWA $PM_{2.5}$ in the living room and CACT on day 5 (r=−0.48, p=0.037). TWA $PM_{2.5}$ exposure was not related to indices of asthma severity including FEV_1 and treatment. Peak $PM_{2.5}$ concentration was not associated with any outcome.



Abstract P77 Figure 1

Conclusions This small study suggests that even at relatively low concentrations, there is an exposure-response relationship between increasing indoor air $PM_{2.5}$ concentrations, increased airway variability and poorer asthma control in children.

P78 IMPACT OF SEVERE ALLERGIC ASTHMA IN CHILDREN: HIGHLIGHTING A ROLE FOR UNDERSTANDING THE FAMILY PERSPECTIVE

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Introduction and objectives Current understanding of paediatric severe allergic asthma tends to focus on the impact of the disease on the child in isolation from the impact on the wider family. We aimed to characterise a paediatric severe asthma population and assess the practical, financial and emotional burden on the family.

Methods Case-note review of children (6–18 years) with severe, allergic asthma (BTS treatment step 4–5) was performed; identifying treatments, disease characteristics and practical limitations (e.g. missed schooldays, impingement on activities). Interviews with the primary care-giver of a child with severe allergic asthma were conducted and aimed to explore the impact of severe asthma on the overall family (e.g. missed workdays, time dedicated to care). Family profiles and cost-modelling will be performed to assess the emotional and economic impact on families of having a child with severe allergic asthma.

Results 35 children from a severe asthma clinic between 2007 and 2010 were identified. Despite being on maximum or near-maximum treatment, nearly 50% of children reported symptoms that impacted on daily activities, or were troublesome at night. Furthermore, 40% reported poor school attendance due to asthma symptoms. When performed, the Asthma UK Asthma Control Test identified a mean score of 15 (range 10–25); with 5/6 patients reporting a score below 20 (very poor control). Data also suggests that the unpredictable nature of severe asthma has an impact on the child and family unit. For example, it was documented how a child felt 'constantly… frightened of these episodes of shortness of breath'. Parents used the words 'catastrophic' and described how they were simply 'fed-up with poor asthma control', highlighting the perceived impact and frustration at caring for a child with severe asthma. Further work on family profiles and cost-modelling is being undertaken to assess the emotional and economic impact on a family of having a child with severe asthma.

Conclusion These preliminary findings suggest that caring for a child with severe asthma has a considerable impact on the functioning of the family unit. A better understanding of the family perspective on the impact of severe allergic asthma in children may help improve outcomes by enabling the development of specific strategies.

P79 IMPULSE OSCILLOMETRY FOR THE ASSESSMENT OF LUNG FUNCTION DEFICITS ASSOCIATED WITH PRESCHOOL WHEEZING

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Introduction Preschool wheezing affects over 1/3 of children, and is associated with lung function deficits. There is a need for a clinical tool to evaluate lung function in preschool children, which is able to detect pathology associated with wheezing. Spirometry is the most common measurement of lung function in school aged children and adults, however spirometry measurements are a challenge in preschool children when conducted outside of specialised labs due to the complexity of the manoeuvres needed. Impulse oscillometry (IOS) is able to measure the resistance and resonant frequency of the lungs from normal breathing, and may be a suitable tool for assessing lung function in preschool children. This study aimed to measure the success rate of IOS for acquiring high quality lung function data in preschool children, and to evaluate the ability of the technique to detect differences between children with and without a history of wheezing.

Methods We recruited 66 children aged 3–4 years from a hospital paediatric outpatients department. Parents were interviewed about their child's health using a structured questionnaire. Children underwent allergy skin prick testing and lung function assessment using IOS pre- and post-bronchodilator. Variables recorded were resistance across 5–25 Hz, resonant frequency (Fres), reactance at 5 Hz and the percentage change in resistances across all frequencies post-bronchodilator.

Results 42 (64%) of 66 children successfully completed lung function assessment using IOS. Younger children were less likely to successfully complete IOS readings (3–3.5 years children 41% success; 3.5–4 years children 71% success; p=0.03). We found a significant increase in Fres in children with a history of wheezing (mean 23.4 Hz wheeze, 19.4 Hz no wheeze; p=0.01). Furthermore,