

Blood and BAL eosinophils had the strongest correlation ($r = 0.57$, $p < 0.001$, $n = 84$). Weaker correlations were found between the other measures. The most promising predictor of BAL eosinophilia was a blood eosinophil count of $0.15 \times 10^9/L$ (PPV 84.1, NPV 71.4) (Table 1).

Conclusions These results suggest that blood eosinophils at a lower cut-point may be a useful measure of lower airway inflammation. However, this is still a relatively invasive test in children and there is little data available about longitudinal stability of blood eosinophils.

REFERENCES

- 1 Ullmann N, et al. *Allergy* 2013;68:402
- 2 Pavord ID, et al. *Lancet* 2012;380:651

P99 COLONISATION WITH FILAMENTOUS FUNGI AND ACUTE EXACERBATIONS IN CHILDREN WITH ASTHMA

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Background Children with asthma are frequently sensitised to fungi and recent observations suggest that fungal sensitisation may be associated with more severe asthma in children.^{1,2} *Aspergillus fumigatus* airway colonisation in adults with asthma is associated with reduced lung function.³ There is a paucity of data on fungal colonisation in children with asthma. The role of fungi in exacerbation prone asthma has not been previously investigated. Our study aim was to evaluate the association between fungal airway colonisation and exacerbation prone asthma in children.

Methods Children aged 5–16 years with stable asthma who attended for a routine hospital outpatient appointment and children with an acute exacerbation of asthma who attended for urgent care to an acute admissions unit were recruited to the study. We obtained a sputum sample either via nebulisation with hypertonic saline in children with stable asthma or nebulisation with 0.9% saline in children with acute asthma. Sputum culture was focused to detect filamentous fungi, in particular *Aspergillus* and *Penicillium* species.^{3,4} Culture and sensitisation results were compared with clinical assessment data.

Abstract P99 Table 1 Demographics and fungi isolated in acute and stable asthma

	Acute asthma n = 26	Stable asthma n = 29	P value*
Median age in years (range)	8 (5–15)	10.5 (5–16)	0.122
Male (%)	17 (65.4)	20 (68.9)	0.778
Filamentous fungi culture positive n (%)	11 (42.3)	5 (17.3)	0.041
<i>A. fumigatus</i>	9	4	
<i>A. niger</i>	0	1	
<i>Penicillium</i>	2	1	

*Mann Whitney or Chi squared test.

Results Fifty five children were recruited to the study; 26 with acute asthma and 29 with stable asthma (17 BTS step 4–5). There was no difference in demographics between the two groups (Table 1). Sixteen children (29%) were culture positive for filamentous fungi, either *Aspergillus fumigatus* (81.3%) or *Penicillium* (18.7%). One child with stable asthma harboured

two different filamentous fungi, *A. niger* and *A. fumigatus*. Children with acute asthma were more likely to be culture positive for filamentous fungi than children with stable asthma (42.3%, $n = 11$ v 17.2%, $n = 5$ respectively, $p = 0.041$). Of the five children with stable asthma who were culture positive for filamentous fungi, three were BTS step 4–5.

Conclusions Significantly more children with acute asthma had filamentous fungi isolated from their sputum compared to children with stable asthma. *Aspergillus fumigatus* was the most common fungus isolated. The potential role of fungal airway colonisation in triggering asthma attacks in children merits further investigation.

REFERENCES

- 1 Castanhinha S, Sherburn R, Walker S, et al. Pediatric severe asthma with fungal sensitization is mediated by steroid-resistant IL-33. *J Allergy Clin Immunol* 2015;136:312–322
- 2 Vicencio AG, Santiago MT, Tsirilakis K, et al. Fungal sensitization in childhood persistent asthma is associated with disease severity. *Pediatr Pulmonol* 2014;49:8–14
- 3 Fairs A, Agbetile J, Hargadon B, et al. IgE sensitization to *Aspergillus fumigatus* is associated with reduced lung function in asthma. *Am J Respir Crit Care Med* 2010;182:1362–8
- 4 Agbetile J, Fairs A, Desai D, et al. Isolation of filamentous fungi from sputum in asthma is associated with reduced post-bronchodilator FEV1. *Clin Exp Allergy* 2012;42:782–91

P100 IMPROVING PAEDIATRICS' PRESSURISED METERED DOSE INHALER TECHNIQUE AND ASTHMA CONTROL: INHALER VERBAL COUNSELLING VS. TRAINHALER

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Introduction Verbal counselling (VC) is commonly used to train patients on correct inhaler technique. Patients forget the good inhaler use with time. Trainhaler (TH), Clement Clarke, UK, is a novel pressurised metered dose inhaler (MDI) training tool designed with feedback mechanisms to train patients coordinate releasing the aerosol with using a slow and deep inhalation flow (IF) through their MDI. Our aim was to compare VC with TH in children with asthma.

Methods Ethical approval was obtained and all children and their parents gave signed consent. At visit 1, asthmatic children, age 7–17 years, with an MDI hand-lung coordination problem including an IF >60 l/min were randomised into either the VC group that received verbal MDI training with emphasis on using a slow and deep IF; or into the TH group that were trained on and given TH to practice at home. Children with correct MDI technique and IF ≤60 l/min formed the control group (CT). An 11-step MDI technique, peak IF through the inhaler and Asthma Control Questionnaire (ACQ) were evaluated. All subjects returned after 6 to 8 weeks (visit 2) for re-evaluation.

Results Thirty children took part. Table 1 presents the study outcomes. All VC and TH had correct MDI steps and slow IF post-training at visit 1. Unlike CT, Wilcoxon test showed a significant decrease ($p < 0.01$) in the incorrect MDI steps between visits 1 and 2, within VC and TH. Mann-Whitney test showed a significant difference ($p < 0.01$) in the incorrect MDI steps between the CT and both intervention groups at visit 1, but no significant difference ($p > 0.05$) was found at visit 2. Paired t-test showed