adherence and other aspects of basic management, as far as possible. We retrospectively evaluated 166 patients (median age at referral 11.7 years [4;17], 61% males). SAFS (n=76) was defined as specific IgE (spIgE) or skin prick test (SPT) positivity to any of Aspergillus fumi-
gatus, Alternaria alternata or Cladosporium herbarum. Non-sensitised patients (n=90) had negative spIgE and SPT to all fungal allergens tested. Age of onset, atopy, symptoms (asthma control test), medi-
cation usage, lung function and airway inflammation were assessed.

**Results** More boys had SAFS (57/76 (75%) vs 43/90 (48%), p<0.001). Children with SAFS had earlier onset of asthma (median 0.5 years [0;12.5] vs 1.5 [0;12.5], p=0.006), higher total serum IgE (657 IU/ml [12;6757] vs 177 [1;10 881], p=0.002) and higher sum of inhalant SPT and spIgE [Allergy 2007;62:1579;86] (16 mm [0;38] vs 9 mm [0;56], p<0.001, and 78 IU/ml [0;400] vs 19 IU/ml [0;245], p=0.02, respectively). Children with SAFS had a lower FEV1 (1.4 L [0.5;5.8] vs 1.9 [0.7;4.3], p=0.005) and lower FVC (2.3 L [0.6;4] vs 2.6 [0.8;5.5], p=0.045). Bronchodilator reversibility was more frequent in SAFS (n=59/75 (81%) vs 42/81 (52%), p<0.001). Maintenance oral steroids were more frequently prescribed in SAFS (n=59/75 (81%) vs 42/81 (52%), p<0.001).

**Conclusions**

The putative small airway markers under investigation are robust and repeatable. Principal components analysis has revealed that the information obtained from multiple tests of airway function may be condensed down to four primary concepts, and that there is significant redundancy among the measurements.

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**S83 REPEATABILITY AND INTER-RELATIONSHIPS OF SMALL AIRWAY BIOMARKERS**

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**Introduction and objectives** There is evidence that the small airways may have an important role in asthma, and a number of physio-
tical techniques have been developed to assess small airway dysfunction. We aimed to determine the within-visit and between-
visit repeatability of putative small airway biomarkers, and explore the inter-relationships between them.

**Methods** We recruited 17 patients with moderate asthma (GINA 3/ 4), twelve patients with severe asthma (GINA 5) and fifteen healthy control subjects. Participants attended baseline, 2-week and 3-month visits. At each visit, participants undertook standard pulmonary function tests, multiple breath washout (MBW), impulse oscillometry (IOS) and measurement of exhaled nitric oxide at multiple flow rates. Five healthy subjects and 10 patients with asthma also undertook hyperpolarised helium-3 MRI at the baseline and 3-month visits. This was used to calculate the apparent diffusion coefficient (ADC), a measure of alveolar airspace size.

**Results** Sair a MBW marker of acinar airspace disease, showed excellent repeatability in patients with asthma, with intraclass correlation coefficients (ICC) of 0.914, 0.897 and 0.879 for within-
visit, 2-week and 3-month repeatability respectively. The IOS small airway markers R5-R20 and AX displayed similarly good repeat-
ability (0.966 [within-visit], 0.905 [2-week] and 0.844 [3-month] for R5-R20, and 0.977 [within-visit], 0.875 [2-week] and 0.855 [3-month] for AX). The 3-month repeatability for ADC was 0.682. Principal components analysis was used to explore the inter-relationships between the small airway biomarkers. Four components were extracted, as shown in Abstract S83 table 1. The highest loading variables on each component were FeNO200, NOalv and MEF on component 1, R5-R20 and AX on component 2, FVC and RV/TLC on component 3, and Kco (% predicted) and ADC on component 4. Thus, components 1–4 corresponded broadly to the concepts of “airway inflamma-
tion”, “frequency dependence of small airway resistance and elastance”, “air trapping” and “alveolar disease” respectively.

**Conclusions**

The putative small airway markers under investigation are robust and repeatable. Principal components analysis has revealed that the information obtained from multiple tests of airway function may be condensed down to four primary concepts, and that there is significant redundancy among the measurements.

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**S84 CAN CLINICIANS ACCURATELY PREDICT NON-ADHERENCE TO MEDICATION IN PATIENTS WITH DIFFICULT ASTHMA? A COMPARISON BETWEEN CLINICAL JUDGEMENT AND PRESCRIPTION ISSUE DATA**

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**Background** It is increasingly recognised that sub-optimal adherence to prescribed medication regimes is common in patients with difficult asthma and may be associated with adverse clinical outcomes. Simple reliable methods of measuring non-adherence have not been developed and clinicians’ judgement is often relied upon as the only assessment of adherence. We have previously shown that checking prescription data are a useful method of investigating non-adherence in this patient population. We aimed to determine how well a clinician’s judgement of adherence correlated to adherence as measured by prescription issue data.

**Methods** Adult asthma patients attending a difficult asthma clinic during July/August 2010 were included. GP retrospective prescription issue data and hospital dispensing data for asthma medications, patient demographics and clinical outcome data were collated. The medication adherence score was calculated as the number of doses issued/number of doses prescribed × 100 for a mean duration of 12 months. Clinicians with an expertise in the management of difficult asthma were asked to stratify each patient according to their perceived adherence, classified as adherent (=80% adherence score; partially adherent 50%–79%; non-adherent <50%). Agreement between clinician judgement and adherence score was analysed using a weighted k coefficient. Logistic regression was performed to determine whether any clinical features could predict better agreement.

**Results** Data from 65 consecutive patients was included in the analysis (41 female, median (range) age 51.2 (61.5)). Clinicians suspected non-adherence in 11/65 (17.4%) of patients, partial
S83 Repeatability and inter-relationships of small airway biomarkers

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