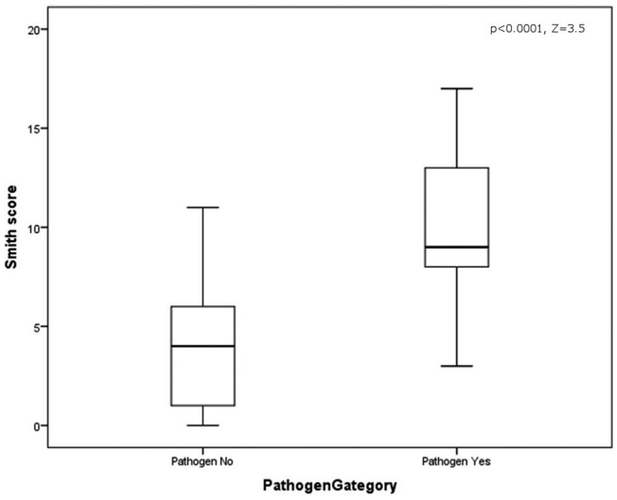

Abstract P67 Figure 1 Smith score in patients with pathogens in sputum cultures and in patients with normal flora

No correlation was found between the extent of bronchiectasis and the lung function parameters. The severity of bronchiectasis (Smith score) was correlated to the number of antibiotic cycles/year ($p = 0.002$, $r = 0.48$). In addition, a lower ACT score was related with a higher asthma exacerbation rate ($r = -0.52$, $p = 0.001$).

Conclusion The evidence of bronchiectasis on HRCT is common in patients with severe uncontrolled asthma. Sputum production and pathogen isolation in sputum culture may indicate the presence of this comorbidity and the need of antibiotics as an additional treatment.

P68 PHENOTYPING INFECTION ASSOCIATED ASTHMA: A CASE-CONTROL STUDY

S Natarajan, R Free, A Wardlaw, S Siddiqui. *Respiratory Biomedical Research Unit, Department of Infection, Immunity and Inflammation, University of Leicester, Leicester, UK*

10.1136/thoraxjnl-2015-207770.205

Introduction and objectives Asthmatics experiencing recurrent infective exacerbations, resembling a bacterial bronchitis, are often started on prophylactic antibiotics but this phenotype of asthma is not well understood. We sought to: a) compare asthmatics with and without recurrent infections using a case-control approach and b) phenotype asthmatics with recurrent infections to evaluate the heterogeneity within this population.

Methods We reviewed Leicester difficult asthma clinic letters within two calendar years (01/01/2013–31/12/2014) and utilised an asthma database to identify matched (age, sex, BMI and GINA treatment step) controls. Case definition: a clinician diagnosis of asthma and $\geq$2 respiratory tract infections/preceding year requiring oral antibiotics or on prophylactic antibiotics. Control definition: a clinician diagnosis of asthma, no evidence of recurrent infections and not prescribed prophylactic antibiotics. A 1:1 case-control ratio was used. 71 cases and 71 controls were identified. The antibiotic use, physiology, CT imaging, immunoglobulins and pneumococcal serotype meta-data were evaluated. Model based cluster analysis was performed to phenotype the cases with no *a priori* assumption made on the number of clusters. Age, sex, age of onset, sputum eosinophil count and Juniper Asthma Control Score were used as the input variables (Am J Respir Crit Care Med.2008 Aug 1;178(3):218–24).

Results The cases were predominately female (69%), obese with recurrent infections (mean:4.25/preceding year) and had an impaired asthma-related quality life compared to controls ($p = 0.0285$). Cluster analysis identified three groups. Cluster 1: male, eosinophilic, on oral corticosteroids with a low IgM, had poor lung function and bronchial wall thickening and bronchiectasis on CT. Cluster 2: female with a blood neutrophilia and preserved lung function. Cluster 3: female, non-atopic with impaired asthma control, a low IgG and air trapping on CT. 63.3% of patients on prophylactic antibiotics ($n = 49$) had a reduction in infective exacerbation frequency. The proportion of patients on antibiotics within each cluster and response was similar.

Conclusion Three subphenotypes of asthma with recurrent infections have been identified. Further immunpathological studies to evaluate the mechanism of infection in each subphenotype, the host microbiome and response to antimicrobials are required.

P69 AN EXPLORATORY STUDY TO INVESTIGATE THE RELATIONSHIP BETWEEN FRACTION OF EXHALED NITRIC OXIDE (FENO) HOME MONITORING AND EOSINOPHILIC AIRWAY INFLAMMATION IN ADULTS WITH SEVERE ASTHMA

CR Nanda, A Singapuri, M Soares, W Monteiro, S Siddiqui, S Gonem. *Institute for Lung Health, Leicester, UK*

10.1136/thoraxjnl-2015-207770.206

Introduction FeNO is a non-invasive surrogate marker of corticosteroid-responsive airway inflammation that may be measured using small portable devices. We aimed to determine (i) the reliability and feasibility of twice-daily FeNO home monitoring in adults with severe asthma, as well as (ii) to explore the relationship between serial FeNO measurements and gold standard markers of eosinophilic airway inflammation.

Methods Ten patients with severe asthma (BTS treatment steps 4/5) were recruited from the Difficult Asthma Clinic at Glenfield Hospital. Patients were provided with portable FeNO monitors (NOBreath, Bedfont Scientific Ltd., Maidstone, UK) for a period of eight weeks, and asked to record twice-daily FeNO (at a flow rate of 50 ml/s) and PEF readings, as well as daily visual analogue scores for cough, breathlessness and wheeze, using paper diaries. They attended fortnightly visits during the study period, at which they underwent sputum induction and full blood count.

Results Nine patients completed the study. The median (range) intraclass correlation coefficient of triplicate FeNO measurements was 0.83 (0.78 – 0.92) for morning measurements and 0.82 (0.71 – 0.97) for evening measurements. There was a median of 7.1% missing data (range 2.7 – 14.3%). FeNO measurements correlated strongly with sputum and blood eosinophil counts, with the strongest correlations observed with a 9-day FeNO moving average, and a lag time of -1 day for sputum eosinophils ($r = 0.571$, $p < 0.001$) and -2 days for blood eosinophil counts ($r = 0.691$, $p < 0.0001$), suggesting that changes in sputum and blood eosinophil counts tended to precede changes in FeNO by 1 and 2 days respectively. In contrast there were no consistent relationships seen between FeNO and either PEF or visual analogue scores.

Conclusion Home monitoring of FeNO is feasible and the measurements are repeatable. Daily FeNO measurements correlate