**Results** 26/39 (67%) patients had at least a partial response, see Table. There was strongest concordance of Results between FeNO and LCI (70%). 11/39 (28%) of patients had a response in at least two domains, 4/39 (10%) at least three, and 1 patient responded in all four domains.
**Conclusions** In this cohort, LCI, FeNO and $FEV_1$ were equally likely to be abnormal at baseline. FeNO and LCI were most likely to respond, (36% and 33% respectively), whereas $FEV_1$ was least responsive to systemic steroids. Using this multi-domain approach 67% improved over 4 weeks following treatment with systemic corticosteroid. The clinical significance of an LCI response remains to be determined. We speculate that this group may reflect a distal airway disease phenotype who may benefit from fine particle inhaled corticosteroids.

**Abstract S70 Table 1** Patients with abnormal results in each of the 4 domains tested pre- and four weeks post-triamcinolone injection

| Measurement | Visit 1 Abnormal | Visit 2 Abnormal |
|---|---|---|
| $FEV_1$ | 23 (59%) | 19 (49%) |
| LCI | 20 (51%) | 7 (18%) |
| ACT | 37 (95%) | 26 (67%) |
| FeNO | 24 (62%) | 10 (26%) |

## S71 ARE ETHNIC DIFFERENCES IN LUNG FUNCTION EXPLAINED BY DIFFERENCES IN RESPIRATORY MUSCLE STRENGTH IN CHILDREN?

NTS Gharbawi, G Duncan , EA Gaillard, M Viskaduraki, CS Beardsmore. *University of Leicester, Leicester, UK*

10.1136/thoraxjnl-2017-210983.77

**Background** South Asian (SA) children have a reduction in forced vital capacity (FVC) of 9%–13% compare to white children. Ethnic differences in Maximal Inspiratory Pressure (MIP) and Maximal Expiratory Pressure (MEP) could potentially explain this. One study in adults measured MIP (but not MEP) in four ethnic groups (not including South Asians) but failed to find any differences (Sachs, Enright et al. 2009).
**Aim** To investigate differences in spirometry and respiratory muscle strength between white and south Asian children.
**Methods** Children were recruited from primary schools. We measured height, weight, and spirometry. $FEV_1$ and FVC were expressed as Z-scores, based on predicted values for white children (Quanjer et al. 2012). For respiratory muscle strength measurements, the child breathed through a pneumotachograph attached to a shutter. To measure MIP, after several quiet breaths, the child exhaled maximally and the shutter was activated. The child made an inspiratory effort and peak pressure was recorded. The test was repeated several times. Measurements of MEP were similar, except that the child inhaled maximally and then made a forceful expiratory effort.
**Results** We studied 263 healthy children aged 5–11 year. We obtained valid spirometry on 229 (64 white, 165 SA); valid MIP on 203 (55 white, 148 SA); and valid MEP on 231 (64 white, 167 SA). $FEV_1$ and FVC were smaller in SA children than their white peers. There were no significant differences between unadjusted MIP and MEP in white and SA children. This finding was unchanged after adjustment for age, height and weight (Table).
**Conclusions** Differences in spirometry were in accordance with previous reports. We did not find any significant differences in respiratory muscle strength between the two ethnic groups. The greater FVC in white children might have been attributable to increased inspiratory muscle strength, leading to a greater volume at the start of the manoeuvre, but this was not the case. An increase in expiratory muscle strength would be less likely to increase FVC, since the end of expiration occurs when there is airway closure. Elastic recoil might be an alternative explanation for ethnic differences in lung function.

**Abstract S71 Table 1**

| | White | South Asian | p |
|---|---|---|---|
| $FEV_1$ Z-score | 0.13 (1.02) | −0.58 (0.96) | <0.000 |
| FVC Z-score | 0.34 (1.00) | −0.69 (0.95) | <0.000 |
| MIP (unadjusted) (kPa) | 7.31 (2.15) | 7.10 (2.03) | 0.54 |
| MIP (adjusted) (kPa) | 7.45 (1.92) | 7.05 (1.91) | 0.19 |
| MEP (unadjusted) (kPa) | 6.27 (1.56) | 6.48 (1.73) | 0.38 |
| MEP (adjusted) kPa) | 6.33 (1.57) | 6.46 (1.56) | 0.59 |

Values are all Mean (SD)

## S72 CLINICAL AND PATHOLOGICAL CHARACTERISTICS OF SEVERELY ASTHMATIC CHILDREN WITH PERSISTENT AIRFLOW LIMITATION

A Nayeem, S Saglani, A Bush, LP Silveira, C Bossley, L Fleming. *Imperial College London, London, UK*

10.1136/thoraxjnl-2017-210983.78

**Introduction** Severe therapy resistant asthma (STRA) in children is heterogeneous: many have normal lung function, however there is a group with persistent airflow limitation (PAL). Little is known about PAL in children and previous studies are limited by the definitions used. We hypothesised that when PAL is classified according to stringent criteria (post bronchodilator $FEV_1$ z score $<-1.96$ after a one-month systemic steroid trial (ERM 2011,Ch 5; 51–59) this group would have distinct clinical, inflammatory and pathological characteristics compared to children without PAL.
**Methods** Retrospective analysis of 103 STRA children. Patients were classified as STRA if they had ongoing poor control despite high dose inhaled corticosteroids plus at least one add on therapy having been assessed as part of a systematic protocol when modifiable factors such as poor adherence were identified and corrected. All children underwent bronchoscopy, bronchoalveolar lavage (BAL) and endobronchial biopsy and received intramuscular triamcinolone. Asthma control test score (ACT); inflammation (exhaled nitric oxide (FENO), induced sputum); spirometry ($FEV_1$. FVC) were measured on the day of bronchoscopy and 4 weeks later. The best $FEV_1$ in the year post triamcinolone was recorded.