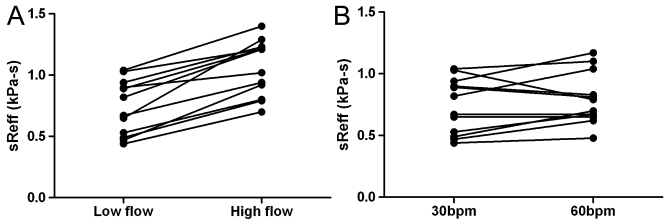


Abstract P126 Figure 1 Within-subject changes in sReff when (A) flows are doubled but breathing frequency remains constant at 30 bpm, and (B) when flows remain relatively constant but breathing frequency is doubled.

Conclusion The true impact of breathing pattern on sRaw relates more to flows attained than to breathing frequency. To facilitate improved repeatability and minimise inter-subject and inter-centre variability, it is essential that subjects are encouraged to breathe quietly and naturally during plethysmographic recordings of sRaw. Software adaptations that allow accurate display of flows during data collection and analysis are required before guidelines pertaining to flow can be generated.

REFERENCES

1. **Dab Alexander.** *Pediatr Res* 1976.
2. **Klug Bisgaard.** *ERJ* 1997.
3. **Kirkby.** *ERJ* 2010.

P127 DOES IT MATTER HOW THEY BREATHE?—PERCEPTIONS IN COPD PATIENTS WHEN ADOPTING DIFFERENT ROUTES OF BREATHING

doi:10.1136/thx.2010.150987.28

[1]A J Williams, [1]A Pitcher, [2]P Thomas, [2]R Baker. *[1]Department of Thoracic Medicine, Royal Bournemouth Hospital, Bournemouth, UK; [2]Dorset Research and Development Support Unit, School of Health and Social Care, Bournemouth University, Bournemouth, UK*

Introduction We have reported that normal subjects prefer nasal breathing (NB) and that the adoption of mouth breathing (MB) is associated with uncomfortable sensations including breathlessness.[1] MB may predispose to the perception of breathlessness by dynamically changing chest wall mechanics (CWM), and thus proprioceptive input. This study has been extended to COPD patients in whom airways resistance and dynamic hyperinflation is likely to alter CWM.

Method 20 COPD patients, mean age 71 years (range 47–89), FEV_1 mean 0.8 l (range 0.4–2.02 l), whilst at rest (tidal breathing), undertook a 2×2 min cross over exercise during which subjects were requested to note their perceptual experiences when randomly allocated to either NB or, after a break, MB. The results have been compared to the individuals preferred route of breathing normally and 20 normal subjects (controls).[1]

Results 10/20 (50%) of COPD patients during NB found the exercise to be uncomfortable compared to only 3/20 (15%) controls (p=0.04). 9/20 (45%) witnessed discomfort with breathing/breathlessness, 0/20 dry mouth and 2/20 (5%) a desire to cough. 13/20 (65%) of COPD patients during MB found the exercise to be uncomfortable compared to 10/20 (50%) controls (p=0.52). 8/20 (40%) COPD patients witnessed discomfort with breathing/breathlessness, and dry mouth 6/20 (30%). 6/20 (30%) COPD patients preferred NB, 7/20 (35%) had no preference and 7/20 (35%) preferred MB during normal breathing in usual life. This compares to 13/20 (65%), 4/20 (20%) and 3/20 (15%) respectively for controls. 9/20 (45%) COPD patients had a positive Nijmegen score (>23) (compared to 0/20 controls) and Hospital Anxiety Depression (HAD) scores were greater in COPD (p<0.001). Depression in COPD patients was strongly associated with a preference for MB normally (r=0.6, p=0.007).

Conclusions This study has shown that COPD patients, in contrast to controls, have adopted a shift in breathing preferences to favour MB. High scores for Nijmegen and HAD in COPD suggest ventilatory dysfunction with depression closely linked to MB. We hypothesise that MB in COPD patients is intricately linked to high levels of ventilatory dysfunction and depression.

REFERENCE

1. *Thorax* 2009;**64**:A153.

P128 THE CHALLENGES OF HYPERTONIC SALINE IN NON-CF BRONCHIECTASIS

doi:10.1136/thx.2010.150987.29

T M Small, H Groves, P McAlinden, J Davison, A DeSoyza. *Freeman Hospital, Newcastle upon Tyne, UK*

Background Non-Cystic Fibrosis (CF) bronchiectasis is an understudied clinical area. Many studies are extrapolated from CF despite prior evidence suggesting this is not wholly appropriate. Recent BTS guidelines have suggested a role for Hypertonic Saline (HS) after findings from Kellet et al (2008). In that study, a nebulised (7%) HS challenge test was done and subjects were to be excluded from ongoing HS therapy if they reported 'chest tightness', 'wheeze' or 'difficulty in breathing', or had a 10% reduction in spirometry following inhalation of HS. Notably none of 23 patients were excluded on these criterion. We hypothesised that a fall in FEV_1 greater than 10% would be more common in a non study population but of limited clinical significance.

Methods We reviewed our 6% hypertonic saline challenge (baseline, post 2.5 mg Salbutamol and post 6% HS) data from consecutive patients commenced on this therapy due to mucus retention despite other interventions (eg, physiotherapy and/or mucolytic) Results: 33 patients were identified (20F, 13M) mean age 61.5±13 years, mean baseline FEV_1 was 1.37L±0.7 (range 0.4–2.65) mean FEV_1% predicted 54%±25% (range 23–111%). One patient's data were excluded due to inability to reproducibly perform spirometry. The mean change in FEV_1 from baseline was +4.3%±10.8 % (range −21 to −36) and fall from post Salbutamol was −0.64±11.6% (range −14 to +14%). Seven patients have stopped HS therapy either due to chest tightness or taste (20%).

Conclusions This cohort is larger than that previously reported and includes a wider range of airflow obstruction severity. No exclusion criterion were applied to trying HS. The overall fall during an acute HS challenge in an unselected bronchiectasis population is small. Despite this many patients discontinue HS within 3 months of initiation.

P129 LUNG CLEARANCE INDEX (LCI) IS A SENSITIVE MARKER OF EARLY AIRWAY CHANGES IN SMOKERS WITH NORMAL SPIROMETRY

doi:10.1136/thx.2010.150987.30

[1]N J Bell, [1]A R Horsley, [1]P A Reid, [2]H S Sheridan, [3]M Monaghan, [3]H Connelly, [1]A P Greening, [1]J A Innes. *[1]Respiratory Unit, Western General Hospital, Edinburgh, UK; [2]Medical Genetics Section, University of Edinburgh, Edinburgh, UK; [3]Stop Smoking Services, NHS Lothian, Edinburgh, UK*

Introduction and objectives Abnormalities in indices of gas mixing derived from multiple breath nitrogen washouts have been demonstrated in smokers without spirometric evidence of airflow obstruction, which improved on smoking cessation. We report initial data from a study investigating the ability of a simpler

measure of gas mixing, Lung Clearance Index (LCI), derived from multiple breath washouts using sulphur hexafluoride as tracer gas and a modified Innocor gas analyser, to detect early airway changes in smokers with normal spirometry.

Methods Current cigarette smokers with a smoking history of over 10 pack years and no known cardiac or respiratory disease were recruited from smoking cessation clinics. Spirometry was performed to ERS standards before and after salbutamol. Participants with post-bronchodilator FEV_1<80% predicted, FEV_1/FVC<0.7, or a significant bronchodilator response were excluded from analysis. St George's Respiratory Questionnaire (SGRQ) was completed. LCI reported is the mean of at least two technically acceptable repeat measurements.

Results 17 participants remained after exclusions, mean age 44 years (range 31–57) and mean smoking history of 25 pack years (range 11–60). Mean (SD) post-bronchodilator FEV_1 and FEF_{25-75} was 101 (12) and 80 (23)% predicted respectively. Only one participant had FEF_{25-75}<60%. There was a moderate negative correlation between smoking history and FEF_{25-75} (r=−0.51, p=0.037) but not between smoking history and FEV_1. Mean (SD) LCI was 7.7 (0.98) with mean (SD) intra-visit coefficient of variation of 3.7 (2.5)%. Eight participants had LCI>7.5 (95% CI for LCI in normal subjects 5.9–7.5), suggesting impaired lung gas mixing. There was a negative correlation between LCI and FEV_1 (r=−0.55, p=0.02) and between LCI and FEF_{25-75} (r=−0.66, p=0.004) but no significant correlation between LCI and smoking history or total SGRQ score. Mean (SD) total SGRQ score was 10.9 (7.5), 12 participants scoring over 7 (95% CI for total SGRQ score in normal subjects 5–7). Total SGRQ did not correlate with smoking history, LCI, FEV_1 or FEF_{25-75}.

Conclusions These data support the hypothesis that LCI is a sensitive marker of early airway changes in smokers with normal FEV_1 and FEF_{25-75}. The effects of smoking cessation on this measure are currently being investigated.

P130 LIMITS OF AGREEMENT FOR PEAK EXPIRATORY FLOW MEASURED BY MINI-WRIGHT'S METER AND A PNEUMOTACHOGRAPH

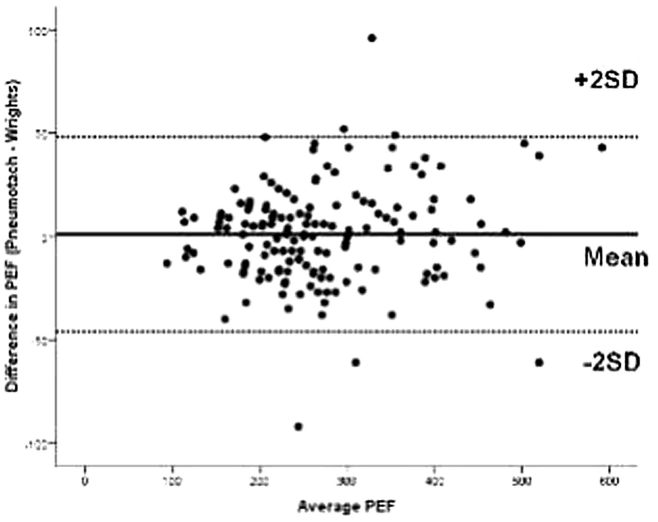
doi:10.1136/thx.2010.150987.31

S J Oliver, E Ingram, D Fynn, D S Urquhart. *Royal Hospital for Sick Children, Edinburgh, UK*

Background Differences in peak expiratory flow (PEF) in children have been shown using a short exhalation PEF compared with a forced vital capacity (FVC) manoeuvre, when measured by turbine spirometry. Furthermore, PEF measures using a traditional Wright's scale PEF metre have been compared with those measured by FVC using a pneumotachograph in adults. The traditional Wright's scale may give rise to misleading results in children, and as such universal adoption of the EU scale has been advocated in the UK. To our knowledge, no study has compared PEF measured using a mini-Wright's EU scale PEF metre and PEF measured by FVC manoeuvres using a pneumotachograph in children.

Methods A retrospective review of children attending asthma clinic at a tertiary paediatric asthma clinic were carried out. Children underwent spirometry (Jaeger Masterscreen PFT Pro) using a pneumotachograph in accordance with ATS/ERS guidelines. In addition, peak expiratory flow (PEF) using a mini-Wright's PEF metre (Clement-Clarke International) was performed by each subject. Bland and Altman statistics were used to assess the limits of agreement for PEF measured by the two different techniques.

Results 161 children (90 male) aged 4–17 years with mean (sd) age of 10.1 (3.2) years were analysed. PEF measures varied from 87 to 613 l/min on spirometry, and from 100 to 570 l/min with the PEF metre. The mean (sd) difference between PEF measures by spirometry and PEF metre was 1.1 (23.5) l/min. A Bland-Altman plot showing mean (+/−2SD) difference is shown (Abstract P130 Figure 1).



Abstract P130 Figure 1

Discussion Whilst close agreement for a childhood asthma population was demonstrated for two measures of PEF, individual differences could be quite marked with 100 l/min differences in PEF measurement being seen in either direction. One should be aware of potential differences in PEF measures when choosing testing equipment. Consideration should be given to dual measures of PEF in the setting of paediatric asthma (and not simply relying on a mini-Wright's PEF alone).

P131 FITNESS TO FLY ASSESSMENT IN PATIENTS WITH NEUROMUSCULAR DISEASE

doi:10.1136/thx.2010.150987.32

J Humphreys, S Agarwal, I Cliff, S Mathew, N Mustfa. *University Hospital of North Staffordshire NHS Trust, Stoke On Trent, UK*

Introduction Patients with neuromuscular disorders (NMD) can develop ventilatory impairment due to respiratory muscle weakness but despite disability, many travel by air. The British Thoracic Society (BTS) recommends hypoxic challenge test (HCT) in those who have baseline oxygen saturation (SpO2) at sea level between 92–95%.[1] However, this recommendation is based on very limited evidence.

Objectives To determine if baseline pulse oximetry at sea level provides a safe guide to predict hypoxia during flying and preclude a HCT in NMD patients.

Methods HCT performed on 12 NMD patients (11 Motor Neuron Disease and 1 Duchene's Muscular Dystrophy) attending ventilation clinic were retrospectively reviewed. HCT was performed to assess their fitness to fly irrespective of their baseline SpO_2. A fall in PaO_2<6.6 kPa was considered positive, PaO_2 between 6.6 and 7.4 kPa was considered borderline and >7.4 kPa was considered negative.[1] Spirometry and sniff nasal inspiratory pressure (SNIP) were also recorded.

Results There were nine male and three female patients, age range 27–72 years (median 63 years). Four patients were positive for HCT and two had borderline results. Only two patients among this group met the criteria for HCT as per BTS recommendation. Six patients were negative for HCT and only one met the criteria for HCT. There was no difference in median FEV_1 (1.85 vs 2.04 L/s) and median FVC