Abstract S43 Table 1 Mean within subject% change, coefficient of variation and biological variability in pulmonary function between timepoints

	Mean% change (95% CI)	Mean CV (95% CI)	Biological Variability (97.5% CI)
FEV ₁	4% (-2 - 10.1)	10.1% (6.7 - 13.5)	0.15 L
FEF ₂₅₋₇₅	6.9% (-5.2 - 19)	20.3% (14.1 - 26.5)	0.21 L/s
FVC	3.3% (-0.8 - 7.1)	6.9% (4.6 - 9.2)	0.15 L
R5	-1.8% (-12.7 - 10.9)	16.1% (11.6 - 20.6)	0.07 kPa/L/s
R20	4.8% (-2.4 - 11.9)	12.5% (9.2 - 15.8)	0.03 kPa/L/s
AX	-12.2% (-39.6 - 15.8)	39.2% (28.9 - 49.6)	0.39 kPa/L
F _{res}	-0.6% (-9.1 - 7.9)	14% (9.4 - 18.5)	1.5 Hz

AX = area under the reactance curve; F_{res} = resonance frequency; R5 = resistance at 5Hz; R20 = resistance at 20Hz; Within subject biological variability was calculated as a one-sided 97.5%CI. Other 95%CI were two-sided.

meaningful response in severe asthma patients. Hence for AX a change ≥ 0.39 kPa/L is required to represent a clinically meaningful response.

Conclusion In conclusion, we report on medium term repeatability for IOS and spirometry and propose values for within subject biological variability in patients with poorly controlled severe asthma.

S44 BRONCHODILATOR RESPONSE FOR AIRWAY OSCILLOMETRY IN SEVERE EOSINOPHILIC ASTHMA

R Chan, CRW Kuo, BJ Lipworth. *Scottish Centre for Respiratory Research, Dundee, UK*

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Introduction Bronchodilator response (BDR) is conventionally defined as a 200ml or 12% improvement in FEV₁. In mild to moderate asthma, forced oscillation technique (FOT) BDR is closely related to asthma control.¹ FOT BDR in patients with severe eosinophilic asthma (SEA) is however unknown.

Aim To determine relative BDR for spirometry and airway oscillometry (AOS, Thorasy Tremoflo) in SEA.

Methods Preliminary baseline data from a prospective study (EudraCT No. 2019-003763-22) are presented on SEA patients in response to 400µg salbutamol.

Results Mean values were age 52, FEV₁ 74%, FEF₂₅₋₇₅ 41%, R5 184%, ACQ 2.9, Eosinophils 576 cells/µl, FeNO 54ppb and BDP equivalent ICS dose 1809µg.

Mean absolute changes were: FEV₁ 0.202 L ($p < 0.001$); FEF₂₅₋₇₅ 0.308 L/s ($p < 0.001$); resistance at 5Hz R5 0.12 kPa/

Abstract S44 Figure 1

L/s ($p = 0.001$); peripheral airway resistance between 5 and 20Hz R5-R20 0.08 kPa/L/s ($p = 0.005$); reactance at 5Hz X5 0.19 kPa/L/s ($p = 0.011$); reactance area AX 2.07 kPa/L ($p = 0.016$) and resonant frequency F_{res} 3.17 Hz ($p = 0.034$). The relative% BDR improvements were greatest for R5-R20, X5 and AX reflecting small airways (figure 1). The standardised response mean (SRM) expresses the signal to noise ratio as mean change divided by SD which were: FEV₁ 2.02; FEF₂₅₋₇₅ 1.6; R5 1.36; R5-R20 1.06; AX 0.87 and F_{res} 0.93 (SRM ≥ 0.80 are considered highly sensitive).

Conclusion The relative% BDR was greater for AOS than spirometry, although conversely the SRMs were better for spirometry than AOS.

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S45 A PUFF OF SUGAR AND A PINCH OF (SPEECH & LANGUAGE THERAPY) SALT: IS THE MANNITOL CHALLENGE TEST A USEFUL INGREDIENT IN THE ASSESSMENT OF INDUCIBLE LARYNGEAL OBSTRUCTION?

¹C Slinger, ¹A Vyas, ¹H Lever, ²R Slinger, ³J Silva, ¹C Prior. ¹Lancashire Teaching Hospitals, Preston, UK; ²Lancaster University, Lancaster, UK; ³University Hospitals of Morecambe Bay, Lancaster, UK

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Introduction In our Tertiary Airways service, we assess for contributors of complex breathlessness, such as asthma and inducible laryngeal obstruction (ILO). Tey et al (2017) studied inhaled mannitol for investigation of laryngeal and bronchial hyper-responsiveness, and concluded inhaled mannitol can be used to induce ILO. Previous studies found abnormalities of the inspiratory flow volume loop (FVL) can indicate need for further investigation of ILO.

Objectives To assess if mannitol challenge testing (MCT) is a useful adjunct in the assessment of ILO, and to measure inter-rater reliability between professionals.

Methods We reviewed 41 consecutive patient records undergoing both MCT and laryngoscopy (undertaken separately) over 15 months. An “upshift” of inspiratory FVL between baseline and maximal dose of inhaled mannitol was taken as indicative of provoking ILO. Ratings of the inspiratory FVL were conducted independently by two speech and language therapists (SLT 1 and 2), a consultant physician and a Respiratory physiologist.

Results Of 41 patients, 25 (61%) had confirmed diagnosis of ILO. Agreement between laryngoscopic diagnosis of ILO and rating of the inspiratory FVL following MCT varied between raters. FVL ratings by SLT 1 agreed with laryngoscopy results 31 times (80%), compared to 27 (68%) agreements by SLT 2, 22 (59%) by the physician and 20 (54%) by the physiologist.

Kappa statistics showed moderate agreement between laryngoscopy and FVL for SLT 1 ($k = .55$), but weak agreement for SLT 2 ($k = .34$) and no agreement for the physician or physiologist.

A binary logistic regression assessed the relationship between laryngoscopy outcome and FVL ratings by SLT 1. The model was significant ($\chi^2 = 12.44$ (1, N=41) $p = .002$) indicating that FVL predicted laryngoscopy outcome, and explained between 24% and 33% of the variance.

Conclusions In assessment for causation of breathlessness, observations of the inspiratory arm of the FVL during MCT may provide clues to the experienced clinician. MCT has potential to be a useful adjunct in the assessment for ILO. However, due to poor inter-rater reliability, further studies are needed to improve our understanding.

Further prospective studies are needed, ideally with MCT and concurrent laryngoscopy to further investigate the utility in assessment for ILO.

S46 LUNG FUNCTION AND PULMONARY SYMPTOMS IN CLASSICAL AND LATE-ONSET FABRY DISEASE

¹AJ Shah, ²N Shafi, ¹A Saigal, ^{1,2}S Mandal, ^{1,2}M Lipman, ^{3,4}DA Hughes. ¹Thoracic Department, Royal Free London Foundation NHS Trust, London, UK; ²UCL Respiratory, London, UK; ³Haematology Department, Royal Free London NHS Foundation Trust, London, UK; ⁴UCL, London, UK

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Background Fabry Disease (FD) is an X-linked condition resulting from an absolute or relative deficiency of the enzyme alpha-galactosidase A (GLA) leading to a multi-system disorder. FD can be divided into: 1) severe, classical phenotype, most often seen in men; 2) milder late-onset phenotype. While the natural course of classical and late-onset FD has been investigated with regards to cardiac, renal and cerebral manifestations, data concerning pulmonary involvement are limited. This study investigated lung function and symptomatic differences between classical and late-onset FD.

Methods Unselected patients attending Royal Free Hospital, a UK specialist unit for FD, were recruited to a prospective observational study. Baseline demographics and symptom burden were recorded, and all patients underwent lung function testing. Patients were divided into classical and late-onset FD based on the Mount Sinai international FD database. Where this was not possible the lead clinician assessed the phenotype.

Results Forty-five FD patients (20 males, 25 females) were recruited with no baseline differences in age, ethnicity, BMI and smoking history. 73% (33/45) were classical (39% male, 61% female) with 27% late-onset (58% male, 42% female) phenotype. 44% of FD patients had evidence of airway

obstruction based on FEV1/FVC <0.7. As classical FD women resemble late-onset males in their disease pattern we compared classical men and the combined group of late-onset men and all women (table 1). Although the latter group were significantly older, there were no significant differences in age-adjusted lung function. The combined group reported increased breathlessness on exertion (SOBOE) (59% vs. 23%, $p=0.03$). However, in subjects with FEV1/FVC <0.7 no significant difference in SOBOE were identified (64% vs. 22%, $p=0.09$).

Conclusion This study confirms a high prevalence of airway obstruction in FD, with no difference between classical men and our combined group. This appears to be generally mild disease, and does not fully explain the greater frequency of patient-reported breathlessness identified in the combined group. Whilst older age appears relevant, it may also reflect other factors such as concomitant cardiac disease.

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S47 HARD TO SWALLOW; INCIDENCE OF OROPHARYNGEAL DYSPHAGIA IN INDUCIBLE LARYNGEAL OBSTRUCTION (ILO)

H Lever, K Prior, A Vyas, C Slinger. Lancashire Teaching Hospitals NHS Foundation Trust, Preston, UK

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Introduction Patients diagnosed with ILO may report clinical respiratory symptoms including dyspnoea, inspiratory wheeze and cough (RCSLT 2021). Symptoms indicative of dysphagia (swallowing difficulties) and dysphonia (voice difficulties) have also been reported within this population (Hull et al 2016).

In clinical practice, altered laryngeal sensitivity has been seen in association with patient-reported dysphagia symptoms, in the absence of a mechanical swallowing difficulty.

Aims and Objectives To explore the incidence of reported dysphagia symptoms in patients with a confirmed diagnosis of ILO, and to investigate how many patients were diagnosed with a mechanical oropharyngeal dysphagia. Associated patient co-morbidities were also reviewed.

Methods A retrospective review across a 2 year period (April 2019–2021) was conducted for patients who had been referred through to a Tertiary Airways service, seen for assessment by an SLT and had a confirmed ILO diagnosis via provocation laryngoscopy (N=160).

Results Of the 160 patients, 52% (N =82) reported symptoms in keeping with oropharyngeal dysphagia. 27% (N= 22) of these patients had a clinical bedside swallow assessment by a dysphagia trained SLT. Of these patients, 50% (N=11) went on to have an instrumental assessment in the form of Video-fluoroscopy (VFS) or Fibreoptic Endoscopic Evaluation of Swallowing (FEES).

Mechanical oropharyngeal dysphagia, resulting in diet and/or fluid modification, was identified in only 2 patients. Of those not formally assessed following case history, typical symptoms reported were in keeping with altered laryngeal sensitivity with no indications of aspiration.

At initial consultation, 8 patients were self-modifying their diet. Other relevant co-morbidities included reflux (71%) and dysphonia (77%).

Conclusions A high proportion of patients (52%) with diagnosed ILO reported symptoms suggesting oropharyngeal

Abstract S46 Table 1 Phenotypic characterisation with regards to lung function and symptoms

	Classic Men	Late-onset men and all females (Combined Data)	P Value
N	13	32	-
Age	39 ± 11	49 ± 15	0.03
Lung function (% predicted)			
FEV1	85 ± 10	92 ± 12	0.08
FVC	100 ± 9	106 ± 13	0.11
FEV1/FVC	70 ± 7	73 ± 8	0.26
MEF50	53 ± 14	60 ± 19	0.25
TLCO	90 ± 15	88 ± 21	0.66
KCO	102 ± 17	94 ± 12	0.08
Symptoms			
SOBOE (%)	23%	59%	0.03
Cough (%)	46%	41%	0.73
Wheeze (%)	31%	34%	0.82

All data parametric, mean ± SD presented
SOBOE = Shortness of breath on exertion