limited to high-risk patients receiving ventilation. Furthermore, mortality day 0–30 post discharge also fell.

Abstract P190 Table 1

		Pre-NSECH	Post-NSECH	P value
Inpatient Mortality	All patients	223/3943	90/2348	0.0012
	(%)	(5.66)	(3.83)	
	Ventilated (%)	71/540	32/346	0.086
		(13.15)	(9.25)	
	Not ventilated	152/3403	58/2002	0.0035
	(%)	(4.47)	(2.90)	
Inpatient+30 day combined	All patients	309/3943	123/2348	<0.0001
mortality	(%)	(7.84)	(5.24)	
	Ventilated (%)	98/540	36/346	0.0015
		(18.15)	(10.40)	
	Not ventilated	211/3403	87/2002	0.0037
	(%)	(6.20)	(4.35)	

P191 GENDER DIFFERENCES IN COPD EXACERBATIONS: ANALYSIS FROM THE CPRD DATABASE

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Introduction and Objective In recent years accumulating evidence supports gender differences in COPD, suggesting a steady increase in COPD prevalence and mortality rates in women. In this analysis we evaluated gender differences in COPD exacerbations in a cohort of COPD patients from the Clinical Practice Research Datalink (CPRD), a general practice electronic primary medical care records database in the UK.

Methods This is a retrospective cohort study comparing women and men with an incident diagnosis of COPD, using secondary data from the linkage between the CPRD and the Hospital Episode Statistics (HES) databases. The study period was between 01 January 2005 and 28 February 2016; patients with an incident diagnosis of COPD between 01 January 2010 and 28 February 2015 were included in this study.

Results A cohort of 22,429 COPD patients (48% women) with an incident diagnosis of COPD was identified. At diagnosis, women were younger, more often current or non-smokers and had lower BMI, better lung function (as expressed by FEV_1% predicted), worse mMRC dyspnea scale scores and lower blood eosinophils. Women also had a higher prevalence of asthma, anxiety, depression and osteoporosis, whereas men had more often cardiovascular comorbidities (myocardial infarction, heart failure and atrial fibrillation). The risk of first moderate or severe exacerbation was 17% greater in women than in men (adjusted HR, 1.17; 95% CI, 1.12 to 1.23), with a median time to first exacerbation of 504 days for women and 637 days for men. These gender differences were more prominent in patients aged 40–64 years and in those with moderate-to-severe airflow obstruction (30% ≤ FEV_1<80% predicted). Women also had a greater rate of moderate or severe exacerbations at year 1 (adjusted RR, 1.15; 95% CI, 1.07 to 1.23), year 2 (adjusted RR, 1.14; 95% CI, 1.08 to 1.21) and year 3 (adjusted RR, 1.14; 95% CI, 1.08 to 1.20) of follow-up.

Conclusions Despite evidence for milder disease at the time of COPD diagnosis, women were at greater risk of COPD exacerbations than men, especially at younger ages. These Results highlight the unmet need for appropriate identification and management of women with COPD in clinical practice.

P192 FUNCTIONAL RESPIRATORY IMAGING (FRI) AND LUNG FUNCTION ASSESSMENT OF GLYCOPYRRONIUM/FORMOTEROL FUMARATE DIHYDRATE FIXED-DOSE COMBINATION DELIVERED USING INNOVATIVE CO-SUSPENSION DELIVERY TECHNOLOGY (GFF MDI) IN COPD

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Introduction and Objectives FRI has been used to provide a detailed view of overall and local changes in airway resistance and lung volume, in addition to spirometry and body plethysmography. The aim of this study was to assess changes in specific image-based airway volume (siVaw) and resistance (siRaw) in patients with moderate-to-severe COPD after administration of GFF vs placebo.

Methods In this double-blind, 2 week dosing, Phase III crossover study (NCT02643082), 20 patients (40–80 years) received twice daily GFF MDI 14.4/10 µg (equivalent to glycopyrrolate/formoterol fumarate 18/9.6 µg) and placebo MDI. Primary endpoints were siVaw and siRaw at Day 15. Additional outcomes included spirometry, plethysmography and safety.

Results On Day 15, GFF MDI led to an estimated 75% increase in siVaw and 71% decrease in siRaw relative to placebo MDI (both p<0.0001; Table), accompanied by post–dose differences of 443 mL in FEV_1 and 454 mL in IC in change from baseline for GFF MDI vs placebo MDI (both p<0.001). The safety profile was consistent with the drug class with no unexpected safety findings.

Conclusions The dual bronchodilator GFF MDI demonstrated significant benefits on FRI–based airway volume and resistance in the lungs of COPD patients. Benefits were associated with important improvements in FEV_1, IC and hyperinflation.

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Abstract P192 Table 1 Functional respiratory imaging, body plethysmography and spirometry endpoints on Day 15 (end of treatment period)

Co-primary functional respiratory imaging endpoints				
	GFF MDI 14.4/ 10 µg	Placebo MDI	LSM ratio GFF vs placebo	p value
siVaw at TLC, mL/L	19/92	19/92	1.75 (1.65–1.86)	<0.0001
n patients/n lobes	1.79 (1.48–2.16)	1.02 (0.85–1.24)		
Geometric LSM (95% CI)				
siRaw at TLC, kPa·s	19/92	19/92	0.29 (0.25–0.33)	<0.0001
n patients/n lobes	0.09 (0.07–0.11)	0.30 (0.23–0.40)		
Geometric LSM (95% CI)				
Spirometry endpoints				
	GFF MDI 14.4/ 10 µg	Placebo MDI	LSM difference GFF vs placebo	p value
FEV_1, mL	19	19	443 (318–569)	<0.0001
n patients	334 (245–422)	−110 (−198,–22)		
LSM change from baseline (95% CI)				
IC, mL	19	19	454 (209–699)	0.0006
n patients	318 (144–491)	−136 (−310, 37)		
LSM change from baseline (95% CI)				
Body plethysmography endpoints				
	GFF MDI 14.4/ 10 µg	Placebo MDI	LSM ratio GFF vs placebo	p value
FRC, mL	19	19	0.87 (0.82–0.92)	<0.0001
n patients	0.90 (0.86–0.93)	1.03 (0.99–1.07)		
LSM ratio to baseline (95% CI)				
RV, mL	19	19	0.78 (0.72–0.84)	<0.0001
n patients	0.83 (0.79–0.88)	1.07 (1.01–1.13)		
LSM ratio to baseline (95% CI)				

CI, confidence interval; FEV_1, forced expiratory volume in 1 s; FRC, functional residual capacity; GFF, glycopyrronium/formoterol fumarate dihydrate; IC, inspiratory capacity; LSM, least squares mean; MDI, metered dose inhaler; RV, residual volume; siRaw, specific image-based airway resistance; siVaw, specific image-based airway volume; TLC, total lung capacity.

P193 THE DEGREE OF LUNG DESTRUCTION WITH EMPHYSEMA ON QUANTITATIVE LUNG CT SCANS VERSUS SUBJECTIVE AND OBJECTIVE IMPAIRMENT IN PATIENTS WITH ADVANCED EMPHYSEMA REFERRED FOR VOLUME REDUCTION THERAPIES

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Background Quantitative CT (QCT) scans of the lungs have been recently introduced for directing clinicians to the most appropriate lobes needing treatment with lung volume reduction (LVR) therapies. Changes in QCT have been considered as a key marker of procedure success. However, despite procedures aiming to improve quality of life and exercise tolerance, there has been no understanding if the degree of emphysema on QCTs correlates with the subjective and objective parameters used in patient selection for LVR.

Methods The pre-treatment QCT used was able to segment the lungs by tracing inter-lobar fissures thus providing data on the volume of each lobe. It was also able to digitally assess the proportion of emphysematous tissue area (defined by Hounsfield units of – 910 or less) in each lobe. Utilising these two properties we calculated the volume of the lungs affected by emphysema by the summation of the emphysema volumes in all lobes. Values and percentage predicted of FEV1, residual volumes (RV) and gas transfer for carbon monoxide (TLco) were obtained from standard measurements; along with a 6 min walk distance (6'WD) and COPD assessment test (CAT) score. Spearman non-parametric correlation test was used to correlate emphysema volume with these parameters.

Results A total of 47 patients (19 female), mean age (SD) of 66.2 (8.9) years were included. Their mean (SD) FEV1 was 0.81 L (0.28). There was no correlation between the total emphysema volume and CAT score (r=-0.21, p=0.2) or with 6'WD (r=-0.34, p=0.054). Total emphysema volume and the value of RV were strongly correlated; r=0.68, p<0.0001. There was no correlation with FEV1 or TLco values. However, percentage of predicted values of lung function tests weakly correlated with total emphysema volume; for FEV1 (r=-0.36, p=0.01), for RV (r=0.34, p=0.02) and for TLco (r=-0. 32, p=0.04).

Conclusion The lack of strong correlation between anatomical changes and lung function is probably due to changes in airway diameter (as well as tissue destruction) which is not captured by QCT. To add to that, the lack of correlation with 6'WD or CAT score is probably due to non-pulmonary factors affecting the values of these two measurements.

P194 LOBAR PERFUSION UPTAKE SIGNIFICANTLY DIFFERS FROM LOBAR LUNG DESTRUCTION IN PATIENTS WITH ADVANCED EMPHYSEMA REFERRED FOR VOLUME REDUCTION THERAPIES

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Background Lung perfusion scan is widely undertaken as part of the assessment to select most affected lobes by emphysema prior to lung volume reduction (LVR) therapies by endo-bronchial valves, endo-bronchial coils and LVR surgery. More recently quantitative CT scans (QCT) have been introduced. QCTs quantify the degree of lung destruction by emphysema. To date there are no studies to evaluate whether lobar uptake of isotope by perfusion scan and areas of destruction on QCT's are closely correlated.

Methods Patients referred for LVR therapies at our hospital underwent perfusion scans using single-photon emission computerised tomography (SPECT) scans. The degree of uptake of isotope in each lobe is visually scored from 0–10, 0 representing low lobar isotope uptake and 10 high uptake. The degree of lobar low attenuation area (emphysema) has been assessed by a QCT scan. This scan provided data on the proportion of each lobe with attenuation of −910 Hounsfield Units (HU) and −950 HU. Uptake on SPECT has been correlated with emphysema score on QCTs.

Results A total 47 patients are included (20 female). Their mean age 66.2 years, and mean FEV1 30% of predicted

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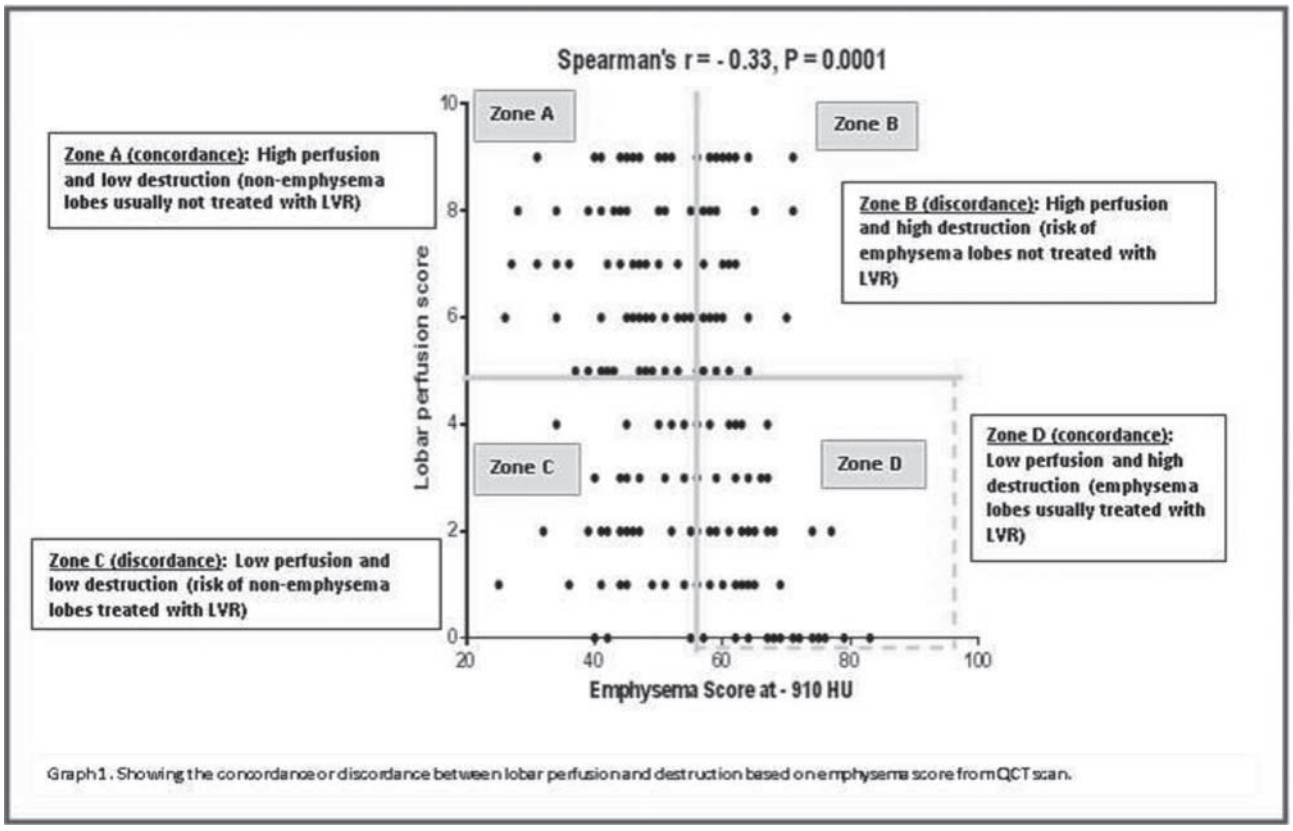

Abstract P194 Figure 1

values. Analysis by QCT and SPECT is available on 235 lung lobes. For all lung lobes, mean low attenuation at −910 HU was 53.7% and at −950 HU of 36.9%. Median Score on SPECT was 5.3 points. A weak correlation between uptake score on SPECT and QCT scores; Spearman r=-0.33, p<0.0001 for emphysema area at −910 HU and r=-0.33, p<0.001 for emphysema area at −950 HU. Significant discordance is present between the two methods (graph.1) which could lead to either treating lobes with low perfusion but preserved lung tissue or not treating lobes with high perfusion but with significant emphysema.

Conclusion Despite the wide usage of perfusion scan to guide identification of lung lobes targeted for LVR, this study shows that this method needs to be interpreted with caution. QCT's should be relied upon to choose lobes needing treatment. Longitudinal analysis is needed to evaluate the outcome of treatment when the treated lobe was selected according to low perfusion.

External influences on asthma

P195 "SYNDROME Z" IN THE ASTHMA POPULATION

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Introduction Current literature demonstrates associations between asthma, obstructive sleep apnoea (OSA) and obesity. Syndrome Z is the occurrence of OSA with the metabolic syndrome, and the relevance of this condition in asthma populations remains unclear.

Methods 192 patients were recruited from a regional severe asthma service and associated respiratory clinics during January 2016-June 2017. 37 had a pre-existing diagnosis of OSA, 116 patients were screened regardless of symptoms, 39 patients with symptoms of OSA were included. Patients underwent an overnight limited channel sleep study and bioelectrical impedance measurements. The groups were split into OSA and no-OSA to compare metabolic profile, associated co-morbidities and body fat composition. Data were analysed using MedCalc version 15.

Results 192 patients with asthma (137 females, 55 males), 173 (90%) had severe asthma, 19 (10%) had non-severe asthma. 37 (19.3%) had pre-existing OSA, 26 of which required Continuous Positive Airway Pressure(CPAP). A total of 97 (51%) had OSA, 58 (30%) had OSA excluded. The OSA group had significantly higher mean Body Mass Index (BMI) (34.8 ±8.2 versus no-OSA group 28.1±6.0, p<0.001), body fat% (38.2%±11% versus no-OSA group 32.2%±12%, p=0.002), visceral fat rating (12.8±5.1 versus no-OSA group 7.4±4.1, p<0.001) and mean metabolic age (59.5±12.8 years versus no-OSA 44.4±16.7 years, p<0.001). The OSA group also had significantly higher rates of diabetes (OSA 0.25±0.47, no-OSA 0.06±0.23, p=0.005), hypercholesterolaemia (OSA 51/132 (38.6%), no-OSA 9/53 (28.6%), p=0.0046) and hypertension (OSA 50/132 (37.9%), no-OSA 6/53 (10.7%), p=0.0004).

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