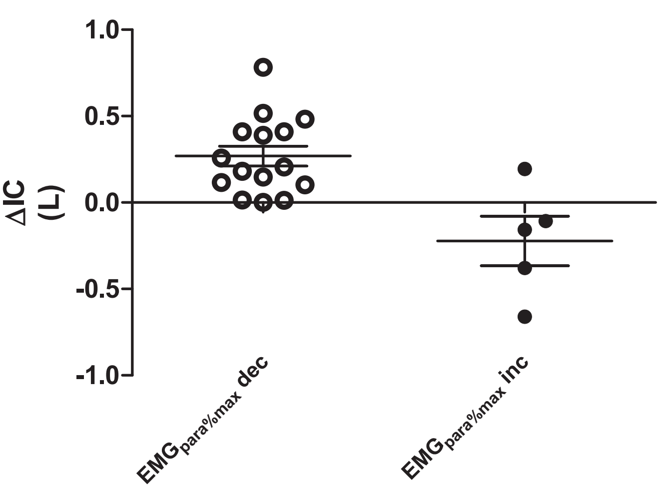
scale and numerical rating scale) were recorded. NRD was expressed as $EMG_{para\%max}$: inspiratory EMG_{para} signal normalised to a maximum signal measured during a sniff manoeuvre. The changes in $EMG_{para\%max}$ (?$EMG_{para\%max}$) and IC (ΔIC) between admission and discharge were analysed.

Results 31 patients were recruited; only 20 (65%) were able to perform spirometry and IC manoeuvres. The baseline characteristics were 69±11 years; male 55%; body mass index 26.1±7.3 kg/m^2; % predicted FEV_1 36.3±9.3; and 41±24 smoking pack years. The overall mean $\Delta EMG_{para\%max}$ of the 20 patients fell by 4%, with 16 (80%) patients experiencing a fall in $EMG_{para\%max}$ during their admission. We observed an indirect relationship between $\Delta EMG_{para\%max}$ and ΔIC (r=−0.52, p=0.02), and between $\Delta EMG_{para\%max}$ and ΔFVC (r=−0.585, p=0.036). We found a correlation between ΔIC and ΔFEV_1 (r=0.658, p=0.015). There were differences in ΔIC between patients whose $EMG_{para\%max}$ decreased during their admission and those whose $EMG_{para\%max}$ increased (mean difference 0.50 l; p=0.003) (Abstract S116 figure 1). There were no significant correlations between dyspnoea scores and ΔIC or $\Delta EMG_{para\%max}$.



Abstract S116 Figure 1

Conclusion DH is a significant contributor to NRD in AECOPD. $\Delta EMG_{para\%max}$ reflects changes in DH during hospital admission, but patient-reported dyspnoea does not indicate the degree of DH, highlighting the limitations of dyspnoea scores. Changes in DH are correlated with changes in airflow obstruction. These data provide a physiological rationale for the utility of parasternal EMG as a non-invasive and non-volitional technique to track clinical change in AECOPD patients.

S117 RESPIRATORY MUSCLE FATIGUE FOLLOWING EXERCISE IN PATIENTS WITH INTERSTITIAL LUNG DISEASE

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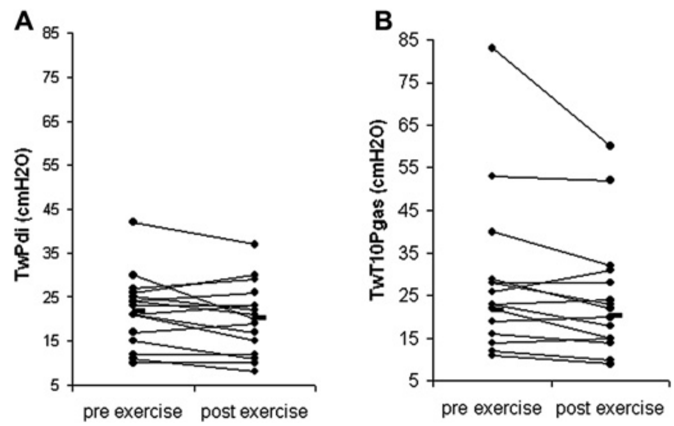
Background Patients with interstitial lung disease (ILD) experience progressive breathlessness and exercise limitation. Although respiratory muscle fatigue has been investigated in healthy subjects and patients with COPD, it is unknown whether it occurs during exercise in ILD patients and, if so to what extent it is related to changes in dynamic lung volumes.

Methods Patients with ILD performed incremental, symptom-limited cycle ergometry with inspiratory capacity manoeuvres used to measure changes in end-expiratory lung volume (EELV). Twitch transdiaphragmatic pressure (TwPdi), in response to bilateral anterolateral magnetic phrenic nerve stimulation and twitch gastric pressure ($TwT_{10}Pga$) in response to magnetic stimulation over the 10th thoracic vertebra were used to assess the development of fatigue.

Results Sixteen ILD patients (11 women) were studied. TwPdi did not differ significantly pre and post exercise (21.8±8 vs 20.2±8 cmH_2O; p=0.10), while $TwT_{10}Pga$ fell from 28.6±18 to 25.2±14 cmH_2O (p=0.02) (Abstract S117 figure 1). EELV fell from 2.18±0.65 l to 1.91±0.59 l following exercise (p=0.04). The fall in TwT10Pgas correlated with peak VO_2 (r=−0.52, p=0.041) increase in heart rate (r=0.53 p=0.032) and with the decrease of EELV during exercise (r=0.57, p=0.021). Abdominal muscle fatiguers (n=9, 56%), defined as a ≥10% fall in TwT10Pga, had a fall in EELV of 22±22% compared to 0.7±8% in non-fatiguers (p=0.016).



Abstract S117 Figure 1 Twitch transdiapragmatic (A) and twitch gastric pressure (B) pressure before and after exercise.

Conclusion Abdominal muscle fatigue develops during exercise in ILD patients in association with increased expiratory muscle activity manifest by reduced EELV.

S118 DIRECT VISUALISATION OF COLLATERAL VENTILATION IN COPD WITH HYPERPOLARISED GAS MRI

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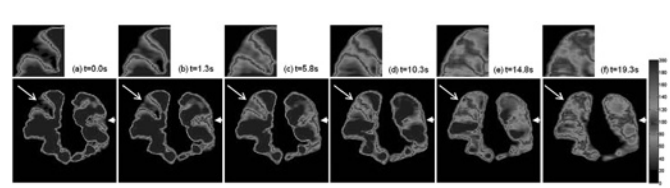
Introduction and Objectives Collateral ventilation is important in pathophysiology of Chronic Obstructive Pulmonary Disease (COPD), complicated pneumothorax, and bronchoscopic lung volume reduction surgery but limited observations of it in vivo have been attained. Current techniques capable of imaging collateral ventilation require monitoring over multiple breathing cycles and



Abstract S118 Figure 1 Images tracking collateral ventilation in a COPD patient (A—F), all displayed with the same colour-scale.