who presented with brain metastases within 6 months of treatment, who had not previously undergone brain imaging. Patients who died within 6 months of treatment were excluded.

Results Data from 579 patients was analysed. Overall the prevalence of brain metastases was 5.5% (10/182) in stage II disease (Pre-treatment cohort 2% (1/51), post-treatment cohort 6.9% (9/131)) versus NICE model prevalence 9.5% (14/161). The prevalence was 6.3% (25/397) in stage III disease (Pre-treatment cohort 4.8% (11/227), post-treatment cohort 8.2% (14/170)) versus NICE model prevalence 9.3% (11/123). Table 1 compares outcomes for the pre-imaged cohort to the data from NG122.

Discussion Our large data set from 11 Trusts across the UK demonstrates the prevalence of brain metastases in stage II and III lung cancer is lower than that used in the economic modelling from NICE. We show that 30% of stage III patients who have brain metastases on pre-treatment imaging continue to undergo radical lung cancer treatment (NICE assumption 0%). A much higher percentage of stage III patients undergo brain specific treatments than was assumed in NICE economic model, even when treatment intent is changed to palliative. This data strengthens the argument to consider re-examining the economic analysis with real-world data.

S74 'SETTING THE STAGE' – CAN WE IMPROVE PATIENT SELECTION FOR PRE-OPERATIVE MEDIASTINAL STAGING WITH EBUS TBNA IN SUSPECTED NSCLC WITHIN THE ERA OF COVID-19?

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Introduction Mediastinal staging for patients with resectable non-small cell lung cancer (NSCLC) is essential prior to surgery. However, given the COVID-19 pandemic, Endobronchial Ultrasound Guided Transbronchial Needle Aspiration (EBUS-TBNA) staging should only be performed for those with significant risk of radiologically occult metastases. The European Society of Thoracic Surgeons (ESTS) recommend pre-operative EBUS-TBNA staging if the tumour is centrally located, larger than 3 cm or associated with N1 disease on imaging.[1] No gold standard definition for a central tumour exists and most centres rely on expert opinion from a Radiologist.[2]

We aim to establish the prevalence of occult N2/3 disease amongst NSCLC patients in a London Hospital, who meet ESTS criteria for EBUS-TBNA,[1] and whether this is influenced by the method used for defining tumour location.

Methods Data was retrospectively collected from patients who underwent staging EBUS-TBNA (based on ESTS guidelines) between 2015–2019.[1] Patients referred for a central tumour and patients who were found to have occult N2/3 disease, had their CT-imaging reassessed by another Radiologist using two protocols adapted from previously published definitions.[2] Protocol 1 (P1) defined a central location as the inner third of the hemithorax. Protocol 2 (P2) used the inner two-thirds.

Results 86 patients underwent pre-operative EBUS-TBNA. Overall, 10 (11%) had occult N2/3 disease, with 4 (4.7%) found by EBUS-TBNA. No MDT-defined central tumours were amongst these. 7/10 cases were retrospectively associated with a P1- or P2-defined central tumour combined with another criteria (Table 1).

Abstract S74 Table 1

Tumour characteristics		Occult N2/3 identified by EBUS TBNA n (%)	Occult N2/3 at Surgery n (%)	Total n
Central location only	MDT	0	0	0
P1	0	0	0	
P2	0	0	0	
> 3 cm only		0	0	0
N1 disease only		1	3*	4
> 3 cm & Central (P2 only)		1	0	1
N1 & Central (P2 only)		0	1	1
N1 & > 3 cm & Central (P1 only)		0	0	0
N1 & > 3 cm & Central (P2 only)		1	2	3
N1 & > 3 cm & Central (P1 & P2)		1	0	1
Total, n		4	6	10

Tumour characteristics associated with cases of radiologically occult N2/3 disease - identified either by EBUS TBNA or by Surgery. MDT = Tumour considered to be in a central location according to the cancer Multidisciplinary Team, P1 = Central tumour identified using Protocol 1, P2 = Central tumour identified using Protocol 2. Asterix(*) denotes one case from this group which had no imaging available for review so P1 and P2 could not be used. The tumour was not considered central by the MDT

14 patients had tumours identified by the multidisciplinary team (MDT) as central. P1 identified 11 patients as having a central tumour and P2 identified 13.

Conclusions When excluding other factors (N1 disease or size), there were no cases of N2/3 disease associated with a central tumour, regardless of the definition used. Thus EBUS-TBNA may not be warranted these patients.

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Basic science in ILD: what drives progression?

S75 HYPERPOLARISED 129-XENON MRI IN DIFFERENTIATING BETWEEN FIBROTIC AND INFLAMMATORY INTERSTITIAL LUNG DISEASE AND ASSESSING LONGITUDINAL CHANGE

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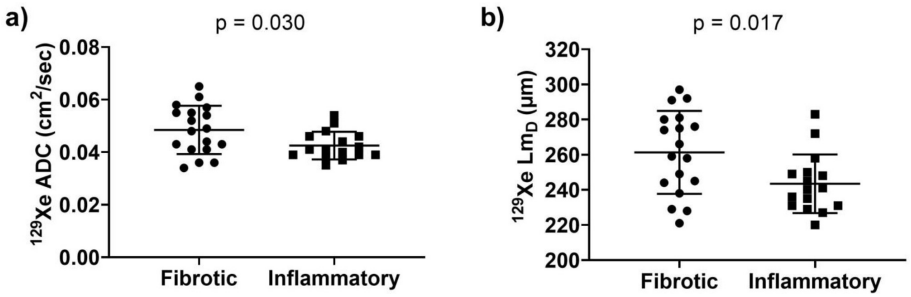

Abstract S75 Figure 1 Difference between the fibrotic and inflammatory groups in mean ^{129}Xe ADC (a) and Lm_D (b) at baseline study visit

Introduction and Objectives Apparent diffusion coefficient (ADC) and mean diffusive length scale (Lm_D) are diffusion-weighted (DW) MRI measurements of alveolar gas diffusion, providing novel lung microstructure information. Hyperpolarised 129-xenon (^{129}Xe) MR spectroscopy is a quantitative marker of gas exchange, using the ratio of uptake of ^{129}Xe in red blood cells to tissue/plasma (RBC:TP).

The objective was to evaluate hyperpolarised ^{129}Xe MRI in differentiating between fibrotic and inflammatory ILD and assessing longitudinal change.

Methods A prospective, multicentre study of ILD patients including connective tissue disease ILD (CTD-ILD), drug induced ILD (DI-ILD), hypersensitivity pneumonitis (HP), idiopathic non-specific interstitial pneumonia (iNSIP) and idiopathic pulmonary fibrosis (IPF). Hyperpolarised ^{129}Xe MRI was performed on a 1.5T scanner. Baseline HRCT scan was performed within a year prior to the MRI scan. Semi-quantitative visual CT analysis was performed by two consultant chest radiologists. In the non-IPF subtypes, a ground glass opacity score <2 and ≥ 2 was used to define fibrotic and inflammatory ILD respectively. All IPF subjects were classified as fibrotic.

Results To date, 34 patients (5 CTD-ILD, 9 DI-ILD, 7 HP, 2 iNSIP, 11 IPF) have complete MRI scan data for two separate visits (6 weeks apart for DI-ILD/HP/iNSIP and 6 months apart for CTD-ILD/IPF). There were 18 patients in the fibrotic group and 16 in the inflammatory group. At baseline visit there was no significant difference in mean RBC:TP between the fibrotic and inflammatory groups (0.17 vs 0.14; p=0.083), but a significant difference between the fibrotic and inflammatory groups in mean ADC (0.048 vs 0.043; p=0.030) (figure 1a) and mean Lm_D(261.3 vs 243.4; p=0.017) (figure 1b). In longitudinal change, there was a significant difference in mean RBC:TP between the fibrotic and inflammatory groups (-0.026 vs 0.0016; p=0.023), but no significant difference between the fibrotic and inflammatory groups in mean ADC (0.00089 vs -0.00025; p=0.25) and mean Lm_D (2.1 vs -0.19; p=0.39).

Conclusions ^{129}Xe DW-MRI could have a role in differentiating changes in the airway microstructure between fibrotic and inflammatory ILD. ^{129}Xe RBC:TP has sensitivity to longitudinal change with a decline in gas exchange observed in the fibrotic group but not in the inflammatory group.

S76 MENDELIAN RANDOMIZATION STUDY OF CIGARETTE SMOKING IN IDIOPATHIC PULMONARY FIBROSIS

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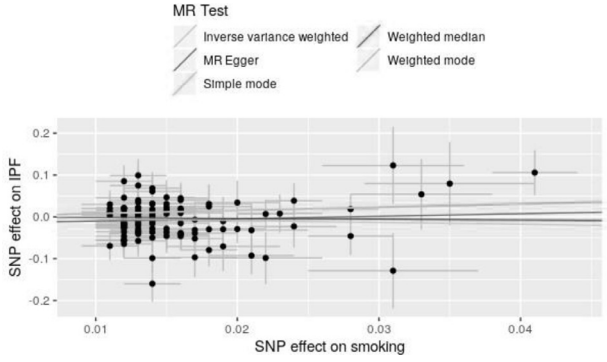
Introduction and Objectives A cigarette smoking – idiopathic pulmonary fibrosis (IPF) association has been observed in several case-control studies. However, it is not known whether smoking causes IPF or if the observed association arises as a result of confounding (for example many studies have used population controls and may be vulnerable to selection bias).

Mendelian randomization can offer an opportunity to investigate causality between cigarette smoking and IPF.

Methods Genetic instruments for lifetime smoking score[1] (taking into account smoking duration and heaviness) were obtained from a genome-wide association study (GWAS) performed in UK Biobank (462,690 individuals, European ancestry). We used variants that were significantly associated with smoking at $p<5 \times 10^{-8}$, which together explained 0.36% percent of variation in lifetime smoking. GWAS summary data for IPF were obtained from The Collaborative Group of genetic studies of IPF[2] (2,668 IPF cases and 8,591 controls, European ancestry). Analysis was performed using the TwoSampleMR package of R.

Results 118 variants were used as instruments. In the main analysis, the odds ratio per standard deviation increase in lifetime smoking score was 0.6 (95%CI 0.4–1, p=0.07). Similar results were obtained in statistical sensitivity analyses.



Abstract S76 Figure 1

Conclusions This Mendelian randomization analysis does not provide evidence to support the notion that smoking causes IPF. It may be that confounding is responsible for the association in observational studies. Clearly, there is a strong case for stopping smoking for other reasons.

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