controls. P = 0.92). Areas of normal lung in IPF patients exhibited increased 18[F]-FDG uptake compared to controls measured by maximum SUV (0.98 ± 0.32 in IPF and 0.70 ± 0.20 in controls, P <0.01) and mean SUV (0.80 ± 0.29 in IPF and 0.57 ± 0.18 in controls, P < 0.01).

Conclusions We confirm that in IPF, areas of normal appearing lung exhibit increased 18[F]-FDG uptake compared with corresponding areas in controls. A longitudinal study is required to establish the relationship between 18[F]-FDG uptake, disease progression and treatment response.

REFERENCE

1 Win T, Thomas BA, Lambrou T, *et al*. Areas of normal pulmonary parenchyma on HRCT exhibit increased FDG PET signal in IPF patients. *Eur J Nucl Med Mol Imaging* 2013;**41**(2):337–42.

P43 HYPERPOLARISED XENON-129 MRI OF LUNGS IN HEALTHY VOLUNTEERS: A SAFETY & FEASIBILITY STUDY

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Introduction Conventional proton MRI, although non-invasive and non-ionising, is of little value in imaging the lungs due to poor signal intensity. Hyperpolarised xenon-129 MRI (129Xe-MRI) is a novel technique developed to enhance the applicability of MRI in lung imaging. It has the potential to provide not only anatomical data but also regional lung function data, particularly as xenon is highly lipophilic, and can be use as a gas exchange probe.

Aim We aimed to assess the feasibility and tolerability of 129Xe-MRI in healthy adult volunteers.

Method This was a single centre prospective observational study. Ethical approval had been obtained. The volunteers had provided written informed consent. A GE 2000 polariser was used for production of hyperpolarised 129Xe, with a 1.5T GE MRI scanner for imaging.

The volunteers underwent a conventional MRI thorax, followed by 129Xe-MRI of lungs. The inhaled volume of hyperpolarised 129Xe ranged 0.6–1.0L. There was 30 minutes of observation with recording of vital signs, i.e., oxygen saturations (O2 sats), heart rate (HR), and blood pressure (BP) at 5, 10, 15, and 30 minutes post-inhalation of xenon, after each scan. Each visit comprised of a maximum of four scans.

Results Nine volunteers (male: female 8:1, aged 20–34) underwent 28 scan visits, comprising of 102 scans. 129Xe-MRI was well-tolerated, with no serious adverse events. The polarisation achieved ranged 4.10–10.57%.

To assess the impact of inhaling xenon on vital signs as a safety measure, the recorded vital signs were analysed using student's t-test. There was no significant change in O2 sats or BP. The most notable change was noted in HR, which was persistently reduced following inhaling xenon ($p < 0.001$). These changes were not deemed clinically significant.

We achieved good image quality (Figure 1). Spectroscopy distinguished lung tissue-dissolved xenon from blood-dissolved. Dissolved phase imaging (DPI) was obtained. The technique was reproducible.

Discussion The data demonstrates satisfactory feasibility and tolerability of 129Xe-MRI. DPI can image regional gas exchange. 129Xe-MRI may be used to develop biomarkers of disease progression, and assess drug efficacy, to personalise medicine, reduce healthcare costs, and lower cost and duration of drug development.

P44 COMPARISON OF STRUCTURAL BRAIN ABNORMALITIES AND COGNITIVE FUNCTION IN COPD PATIENTS AFTER HOSPITALISATION, STABLE COPD PATIENTS AND HEALTHY AGE-MATCHED CONTROLS

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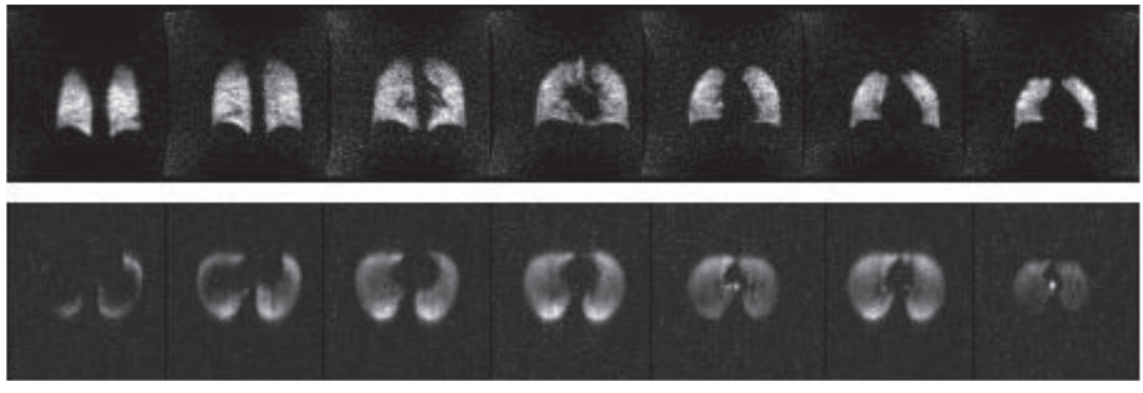
Introduction and objectives Cognitive impairment is a common co-morbidity in chronic obstructive pulmonary disease (COPD) and is associated with poor disease management, greater disability and mortality [Chang *et al*., J Am Geriatr Soc, 2012;60:1839–46]. We have previously shown that cognitive impairment is worse in COPD patients during and after hospitalisation for exacerbations, than in those with stable disease [Dodd *et al*. Chest, 2013;144:119–27]. Our aim was to use multimodal brain magnetic resonance imaging (MRI) to compare structural brain abnormalities between hospitalised and stable COPD patients and healthy controls.

Methods 23 COPD patients hospitalised for exacerbations within the last year (hospitalised), 17 COPD patients not hospitalised



Abstract P43 Figure 1 25 mm coronla plane (top row) and axial plane 129Xe-MRI of a healthy volunteer