infection presented with a higher probability of memory problems, difficulty concentrating, hair loss, and taste/smell problems than non-COVID-19 ARI.

**Conclusions** Both SARS-CoV-2 and non-COVID-19 ARIs are associated with a wide range of long-term symptoms. Research on post-acute sequelae of ARIs should extend from SARS-CoV-2 to include other pathogens.

Please refer to page A282 for declarations of interest related to this abstract.

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**GAS EXCHANGE IMAGING USING DISSOLVED-PHASE 129Xe MRI IN POST COVID COHORTS**

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**Introduction** Hyperpolarised 129Xe MRI allows quantitative and regionally sensitive measurement of gas exchange. The objective of this work is to characterise longitudinal lung function abnormalities using hyperpolarised 129Xe MRI in patients hospitalised due to COVID-19.

**Methods** A comprehensive 1H and 129Xe 1.5T MRI protocol has been implemented in two longitudinal studies of patients hospitalised due to COVID-19, up to 2 years after hospitalisation: i) with normal or near-normal CT[1] ii) with abnormal CT consistent with signs of interstitial lung damage at 12 weeks post-hospitalisation as part of the XMAS study[2].

Matching MRI protocols were performed in both studies including dissolved phase xenon imaging, from which the fraction of xenon dissolved in the pulmonary red blood cells compared to the xenon dissolved in the pulmonary membrane is calculated (RBC:M) as a measure of xenon gas transfer. PFTs were also performed. Longitudinal and group comparisons were assessed using non parametric tests.

**Results** 8 patients with normal CT (6 months, n=7; 1 year, n=8; 2 years: n=5) and 25 patients with abnormal CT were recruited (6 months, n= 16; 1 year, n=16; 2 year, n=6).

Patients with normal CT showed abnormal xenon gas transfer (RBC:M) with no longitudinal change between 6 months and 1 year. TLCO Z-score was normal in 7/7 patients at 6 months, 7/8 patients at 1 year and 3/3 patients with data available at 2 years.

Patients with abnormal CT had significantly greater xenon gas transfer impairment at 1 year (6 months: p=0.056, 1 year: p=0.032) and lower TLCO Z-score predicted than patients, with normal TLCO Z-score in 4/16, 3/16, and 1/6 patients with data available at 6 months, 1 year and 2 years respectively.
Conclusions Xenon gas transfer can detect ongoing abnormalities in patients hospitalised due to COVID-19 up to two years after hospitalisation, including in patients with normal CT and PFTs.

Please refer to page A283 for declarations of interest related to this abstract.

LONG-COVID: A MULTI-FACETED SYNDROME EXPLORED IN THE EXPLAIN STUDY (HYPERPOLARISED XENON MAGNETIC RESONANCE PULMONARY IMAGING IN PATIENTS WITH LONG-COVID)

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Background Never hospitalised Long-COVID(NHLC) patients are significantly affected by debilitating symptoms. EXPLAIN is a prospective, multi-centre, observational cohort study investigating breathlessness in these patients, comparing multi-parametric imaging (including hyperpolarised dissolved 129Xe MRI (HPX-MRI)), Lung Function Tests(LFT), simple exercise tests, dyspnoea scores, blood markers of coagulopathy and endotheliopathy, structured light plethysmography-assisted breathing pattern assessment and questionnaire outcome measures in dyspnoic (DLC,200 participants), non-dyspnoic (NDLC,50) NHLC patients and asymptomatic post-COVID controls (C,50). Here, we explore the relationships of symptom-related questionnaire outcomes with DLCO and HPX-MRI metrics in NHLC patients.

Methods Adult NHLC patients were recruited from post-COVID clinics and COVID-19 recovered asymptomatic controls from the general population. Participants with significant smoking history or cardiopulmonary diseases were excluded. Low-dose CT and LFT were performed alongside the measurement of xenon gas transfer (via the global mean imaging ratio RBC:M) using HPX-MRI.

Results 189 participants have been recruited to date (DLC=113/200, NDLC=33/50, C=43/50). In this study, questionnaires were completed only by the patient cohorts (103 completed to date). In the DLC and NDLC groups, the median time from infection was 466(305–745.8) and 301(219–584) days, Dyspnoea-12 score 13(7.75–19) and 2.5(0–5.25) and visual analogue scale-fatigue(VASF) score 6(4.5–7.125) and 7(5–7.625) respectively. The mean age was 45.8±12.5 and 48±11.3 years, BMI 28±5.8 and 28.4±6.7 kg/m, DLCO predicted 93.9±16% and 93.7±12.1% and mean RBC:M 0.325±0.086 and 0.305±0.089 in the DLC and NDLC groups respectively. In this interim analysis, CT score data was available in 77 patients, of which 76 had normal or near-normal CT findings (i.e. CT score<5) and 1 with a score of 11.

In the DLC and NDLC groups, the median time from infection was 466(305–745.8) and 301(219–584) days, Dyspnoea-12 score 13(7.75–19) and 2.5(0–5.25) and visual analogue scale-fatigue(VASF) score 6(4.5–7.125) and 7(5–7.625) respectively. The mean age was 45.8±12.5 and 48±11.3 years, BMI 28±5.8 and 28.4±6.7 kg/m, DLCO predicted 93.9±16% and 93.7±12.1% and mean RBC:M 0.325±0.086 and 0.305±0.089 in the DLC and NDLC groups respectively. In this interim analysis, CT score data was available in 77 patients, of which 76 had normal or near-normal CT findings (i.e. CT score<5) and 1 with a score of 11.

Conclusions Symptomatology in NHLC persists beyond a year of infection in those with unremarkable CT findings.