Abstract P95 Figure 1

valve implantation or were excluded from any invasive option at the discretion of the responsible physician. Full pulmonary function testing (PFT) was performed.

Results A total of 425 symptomatic AS patients were included. Of these, 313 (74%) underwent PFT. COPD was clinically recognised in 25% (n=110) of the total group and in 20% (n=64) of the AS patients with PFT. On PFT Results analysis, the actual prevalence of COPD was even higher (33%). COPD severity in AS based on FEV₁ was classified as follows: mild in 46%, moderate in 41%, severe in 12%, and very severe in 1%. There were no differences in terms of aortic disease severity, body habitus, functional class nor cardiac function in patients with or without COPD. AS patients with COPD were more likely to be males (56% vs 43%, p<0.001) and with a non-significant tendency to older age (80±7 vs 78±8, p=0.07). Of the AS COPD patients, only 9% were on inhaled treatment. During a mean follow-up of 16±10 months, patients with COPD showed higher rates of all-cause mortality compared to patients without COPD (39% vs. 20%, p<0.001). COPD was an independent predictor of all-cause death (HR: 2.1, 95% CI: 1.4 to 3.2, p<0.001).

Conclusion COPD in symptomatic AS is common, under-treated and associated with an increased risk of death. Spirometry and COPD case-finding should be performed when managing patients with symptomatic AS.

P96 DEATH RELATED TO CARDIOVASCULAR DISEASE IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Chronic obstructive pulmonary disease (COPD) kills over 5.6% (3.2 million) of the world population every year and is projected to increase to 7.8% by 2030. According to the literature about a third of patients with COPD die of cardiovascular disease (CVD). However, these findings do not match clinical data from the Evaluating the Role of Inflammation in Chronic Airways disease (ERICA) cohort – a multi-centre observational cohort study of 729 patients with COPD – nor published data from the late 60s indicating only about a tenth of patients dying of CVD. The aim of our study was to categorise causes of death, and compare self-reported CVD incidence with electronic health records. Clinical data were linked to mortality data from the Office for National

Statistics. Causes of death were categorised by cardiovascular and respiratory physicians. Self-reported cardiovascular events were compared with hospital episode statistics. Results indicate that after 5 years of follow-up, a majority of deaths (n=119) are due to pulmonary causes (53%), followed by cancer (24%) with fewer cases than expected having a cardiac cause of death (14%). Eight per cent died of other causes. In addition, there were only few severe cardiovascular events such as stroke and heart attack. It might be that globally the cause of death within COPD has changed over several decades with increased numbers of cardiac causes of deaths but our findings do not indicate as many cardiac deaths and this trend might at least exclude the UK and warrants further exploration.

P97 A CROSS-SECTIONAL ANALYSIS OF DOMAIN SPECIFIC COGNITIVE IMPAIRMENT IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Introduction and Objectives The typical profile of patients with Chronic Obstructive Pulmonary Disease (COPD) includes a wide range of co-morbidity, with increasing evidence demonstrating an association between COPD and cognitive impairment. This cross-sectional study aims to demonstrate domain specific cognitive function and deficit in patients with mild-moderate COPD using the comprehensive Addenbrookes Cognitive Examination-III assessment (ACE-III). It also aims to compare the nature of cognitive impairment in patients with COPD to patients with Alzheimer's type dementia (AD).

Methods We enrolled 44 patients with mild or moderate COPD, 17 patients with mild or moderate AD and 28 control patients with a similar age profile and gender distribution. We analysed the difference in ACE-III total scores and domain specific scores between the groups and additionally performed logistic regression analyses to account for cardiovascular co-morbidity and smoking exposure.

Results Patients with COPD had significantly lower total ACE-III scores (p<0.001) compared to the control group with 47.5 percent of patients demonstrating scores below the recognised cut-off score for cognitive impairment of 88 out of 100. This association remained even when accounting for cardiovascular co-morbidity and smoking exposure. There was no significant difference in the visuospatial cognitive domain (p=0.062),

however, compared to the control group patients with COPD demonstrated significantly lower scores in memory ($p<0.01$), attention ($p=0.013$) fluency ($p=0.002$) and language ($p=0.004$) domains. Interestingly the pattern of cognitive impairment in patients with COPD was similar but less severe compared to patients with AD who demonstrated significantly lower total ACE-III scores ($p<0.001$).

Conclusions This study demonstrates a high burden of cognitive impairment in patients with COPD. Interestingly the cognitive domains of memory, attention, fluency and language seem to be predominantly affected in this population. These findings further our understanding of cognitive impairment in patients with COPD, with patients exhibiting a similar but less severe pattern of cognitive impairment to that seen in the AD group.

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GREY MATTER ATROPHY, RETINAL VESSEL DILATATION & REDUCTION IN AORTIC DISTENSIBILITY IN COPD: THE RELATIONSHIP BETWEEN MULTI-ORGAN VASCULAR MEASURES

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Background COPD is linked to risk of MI, stroke and white matter brain lesions, but there is no recognised method of identifying those who go on to have acute vascular events. It also remains unclear if vascular risk in COPD is truly independent of smoking. The Novel Vascular Manifestations of COPD (NoVasC) study was designed to address this limitation through direct comparison of COPD patients and smoking controls using multimodal brain MRI, retinal photography, cardiac MRI (CMR) and aortic stiffness in addition to cognitive and disease severity measures.

Methods MR brain volumes, diffusion, blood flow and white matter lesions were acquired for 27 COPD patients (age 67 ± 8 , 41% male, pack years 39 ± 21 , FEV₁ $58\% \pm 18\%$ predicted) and 23 controls (age 63 ± 9 , 48% male, pack years 30 ± 14 , FEV₁ $101\% \pm 19\%$ predicted). CMR of LV and RV function, volumes and aortic distensibility were captured using a 3-Tesla MR scanner. Pulse wave velocity and augmentation index were acquired using Vicorder. Retinal fundus photographs were analysed using validated automated software (SIVA). Analyses adjusted for differences in age, gender, blood pressure and pack years smoked.

Results Significant differences in grey matter volume ($p=0.004$), retinal vessels ($p=0.005$) and CMR ($p=0.01$) were identified in COPD (Table 1). There was significant correlation between grey matter volume and BMI ($r=-0.42$ $p=0.005$) only. White matter lesion volume was associated with FEV₁/FVC and creatinine ($r=0.29$ $p=0.048$ and $r=-0.33$ $p=0.027$). Cerebral blood flow was associated with

arterial pH in COPD ($r=-0.49$ $p=0.019$). There were no significant associations identified between other MR brain, cognition, disease severity or retinal measures. Significant correlations were identified between CMR and white matter damage (DTI $r=0.50$ $p=0.001$) and FEV₁/FVC ($r=0.447$ $p=0.003$) and retinal measures with FEV₁% pred ($r=-0.43$ $p=0.006$).

Conclusions Grey matter atrophy, retinal vessel dilatation, and aortic distensibility are present in COPD. White matter lesions volume is associated with lung function but there was no relationship between other MRI brain measures, cognition or disease severity. Non-invasive vascular measures of retinal vessels and cardiac MR appear to relate to lung function and white matter damage and warrant further investigation in larger longitudinal studies of vascular events in COPD.

Abstract P98 Table 1 COPD group vs. smoker controls ANOVA corrected for age, gender, mean arterial blood pressure and pack years smoked

		Sum of Squares	df	Mean Square	F	Sig.
Normalised White Matter Volume	Between Groups	0.625	1	0.625	0.115	0.736
	Within Groups	260.862	48	5.435		
	Total	261.487	49			
Normalised Grey Matter Volume. VBM	Between Groups	19.169	1	19.169	9.181	0.004†
	Within Groups	100.216	48	2.088		
	Total	119.385	49			
Retina Factor	Between Groups	7.589	1	7.589	8.925	0.005†
	Within Groups	37.411	44	0.850		
	Total	45.000	45			
Cardiac MR Factor	Between Groups	6.204	1	6.204	7.015	0.011†
	Within Groups	39.796	45	0.884		
	Total	46.000	46			
Cerebral Diffusion Tensor	Between Groups	2.283	1	2.283	2.345	0.132
	Within Groups	46.717	48	0.973		
	Total	49.000	49			
Cerebral Blood Flow	Between Groups	0.454	1	0.454	0.449	0.506
	Within Groups	48.546	48	1.011		
	Total	49.000	49			
White Matter Lesions	Between Groups	0.412	1	0.412	0.407	0.526
	Within Groups	48.588	48	1.012		
	Total	49.000	49			

†p value<0.01