Abstract M139 Table 1 Comparison between frail and non-frail patients with COPD

	Frail (n = 446)	Non-Frail (n = 54)	p value
Age (years)	66 (7)	65 (7)	0.380
FEV ₁ % predicted	58 (20)	66 (21)	0.011
BMI (kg/m ²)	28.2 (5.6)	26.4 (3.2)	0.049
Waist circumference (cm)	100 (15)	94 (10)	0.025
Fat Mass (kg)	27.1 (11)	23.1 (7.2)	0.027
HGS (kg)	26.6 (9.7)	32.5 (10.1)	0.001
Aortic PWV (m/s)	10.0 (2.4)	9.0 (1.9)	0.012
Stroke Volume (ml)	85 (20)	92 (23)	0.042
Central systolic blood pressure	146 (19)	143 (16)	0.377
Central diastolic blood pressure	84 (11)	82 (9)	0.643
Central mean blood pressure	104 (12)	103 (11)	0.605
6MWD (m)	313 (121)	450 (72)	0.001
TUG (s)	11.3 (3.8)	8.7 (1.4)	0.001
Smoking (packs/year)	41 (25)	36 (23)	0.229
No. Exacerbations/ year	2.3 (1)	1.0 (1)	0.001
CRP (mg/L)#	3.6 (2.9)	2.80 (2.2)	0.174
SGRQ	53.1 (19.1)	21.6 (13.6)	0.001

mean (95% CI), 0.15 (0.14–0.16) than in comparators, 0.05 (0.03–0.05), independent of age, p

Conclusion Patients with COPD were frail compared with the comparator group of current or ex-smokers, independent of age. Frailty status in the patients was associated with a greater severity of the extra-pulmonary involvement including cardiovascular risk based on greater aortic PWV. Increased aortic PWV in frail patients was independent of blood pressure. These findings are consistent with premature cardiovascular ageing in COPD.

REFERENCE

- Newman et al. *J Gerontol A Biol Sci Med Sci*, 2001;56:M158-66

M140 EFFECT OF BETA-BLOCKADE ON LUNG FUNCTION IN A POPULATION WITH ARTERIAL VASCULAR DISEASE WITH AND WITHOUT COPD

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Introduction Patients are frequently prescribed β -blockers for heart failure, ischaemic heart disease and peri-operatively, especially for vascular surgery. However, β -blockers remain under prescribed in patients with COPD despite epidemiological evidence indicating little negative impact. This reluctance to use β -blockers is due to concerns about increased airway hyper-responsiveness and bronchoconstriction. As part of a study of peri-operative β -blockade in patients with abdominal aortic aneurysm (AAA) we examined the effect of β -blockers on lung function.

Methods We prospectively recruited 55 AAA patients with no selection bias for COPD or β -blocker use. Thirty eight patients successfully completed detailed lung function testing (PFT) measured by body plethysmography both on and off β -blockers. Subjects already taking β -blockers continued usual treatment while others were prescribed weight adjusted bisoprolol for 48 h.

Results Mean age was 70 (5) years and 33 (77%) subjects were male. 16/38 (42%) were already taking beta-blockers and 5 people (15%) were diagnosed with COPD although 15 (39%) had COPD based on spirometry. Ten (26%) were current smokers and 19 (50%) ex-smokers. The lung function results are shown

Abstract M140 Table 1 Change in lung function variables with and without beta-blockade in 38 subjects with and without COPD. # p < 0.05 on vs. off beta-blockers

	COPD (n = 15)		No COPD (n = 23)	
β -blockers	On	Off	On	Off
FEV ₁ (L)	2.00 (0.48)	2.12 (0.55)	2.83 (0.59)	2.89 (0.61)
FEV ₁ %	73.7 (14.6)	77.9 (17.2)	104.4 (17.5)	106.3 (17.9)
FVC (L)	3.59 (0.65)	3.67 (0.72)	3.75 (0.83)	3.69 (0.8)
FVC (%)	101.7 (15.8)	103.9 (16.4)	109.9 (17.92)	109.6 (20.2)
FEV ₁ /FVC	55.4 (7.6)	57.4 (9.0)	75.18 (6.4)	76.3 (4.6)
IC (L)	2.84 (0.55)	2.90 (0.36)	2.92 (1.57)	2.84 (0.6)
RV (L)	4.08 (0.6)	3.82 (1.07)	2.83 (1.26)	2.75 (1.3)
TLC (L)	7.51 (1.28)	7.51 (1.49)	6.66 (1.46)	6.58 (1.7)
DLco	5.92 (2.24)	6.04 (2.28)	6.41 (1.45)	6.44 (1.5)
DLco (%)	73.1 (24.4)	74.8 (25.0)	78.9 (15.9)	80.4 (16.5)
Kco	1.06 (0.34)	1.06 (0.33)	1.25 (0.2)	1.24 (0.22)
Raw	2.48 (0.47)	2.61 (1.02)	1.95 (0.7)	2.11 (0.74)
sRaw	12.89 # (3.25)	11.71 (2.76)	8.35 # (3.3)	7.61 (3.2)
sGaw	0.09 (0.02)	0.09 (0.03)	0.14 (0.06)	0.14 (0.05)

in the table. Beta-blockade had no significant impact on most lung function measures in both COPD and non-COPD subjects. Specific airways resistance (sRaw) was significantly higher when subjects were taking β -blockers but this effect did not differ between COPD and non-COPD subjects (Δ sRaw: whole group p = 0.004, COPD p = 0.025, non-COPD p = 0.031).

Discussion β -blockers had little effect on static lung function including FEV₁ and specific conductance. The small change in resistance was seen in subjects with and without COPD. In this population there appears to be no reason for not using a cardio-selective β -blocker both in this peri-operative setting and for cardiac indications.

M141 IMPACT OF BETA-BLOCKADE ON EXERCISE CAPACITY AND DYNAMIC HYPERINFLATION IN PEOPLE WITH AND WITHOUT COPD AWAITING VASCULAR SURGERY

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Beta-blockers have a key role in the management of heart failure but have been under-utilised in people with COPD due to fear of bronchoconstriction and its impact on symptoms and function. Beta-blockers are also used peri-operatively in people undergoing vascular surgery due to improved cardiac function though this practice is contentious due to a risk of post-operative complications, particularly stroke. As part of a study looking at

Moderated posters

Abstract M141 Table 1 Change in peak CPET variables and inspiratory capacity at isotime with and without beta-blockade in 46 subjects with and without COPD

	COPD (n = 25)		No COPD (n = 21)	
	ON	OFF	ON	OFF
β -blocker	17.4	17.8	19	18.9
	(3.5)	(3.5)	(6.1)	(6.3)
Peak VO ₂	1.43	1.46	1.58	1.56
	(0.31)	(0.32)	(0.51)	(0.47)
Peak VO ₂ /kg	102#	106	113	110
	(27)	(27)	(30)	(31)
Peak Work	37.2 #	38.7	39.2	39.3
	(4.9)	(5.7)	(5.3)	(5.1)
Peak VE/VO ₂	33.9	34.6	34.6	35.3
	(3.3)	(3.9)	(3.9)	(3.8)
Peak VE/VC0 ₂	12.6 ##	10.9	14 ##	11.9
	(2.6)	(2.4)	(3.7)	(3.1)
Peak O ₂ Pulse	114 ##	134	114 ##	132
	(15)	(17)	(25)	(19)
Δ IC isotime (ml)	-142 ~	-188 ~	-15	-16

~ p < 0.05 COPD vs. no COPD, # p < 0.05 on vs. off beta-blockers and ## p < 0.01 on vs. off beta-blockers

the impact of beta-blockade in people under abdominal aortic aneurysm surveillance we examined the impact of beta-blockade on CPET variables and dynamic hyperinflation at peak exercise

55 subjects were recruited though only 46 completed incremental CPET off and on beta-blockers. Mean age was 70 (6) years and 42 (91%) were male. IHD or heart failure was diagnosed in 13 people and COPD diagnosed in 7. However, 24/46 (52%) had post-bronchodilator airflow obstruction consistent with COPD (10 mild, 10 moderate and 4 severe). 18 were routinely prescribed beta-blockers (mainly bisoprolol). Those taking beta-blockers stopped treatment for the second CPET and other subjects commenced weight-adjusted bisoprolol before the second CPET.

The 25 COPD subjects had a mean FEV₁ of 2.14 (0.62) L, FEV₁ predicted 76 (20)% and FEV₁/FVC 0.54 (0.11). The main results are shown in the table. Compared with the subjects without COPD at peak exercise the COPD subjects had slightly lower VO₂, work and ventilatory equivalents but these did not differ significantly. When beta-blocked both COPD and non-COPD subjects had a lower heart rate (p < 0.001) and consequently oxygen pulse (p < 0.001) but there was a minimal effect on other variables. The COPD patients showed a greater fall in IC (p = 0.02) but the addition of a beta-blocker did not have any additional effect. The 7 subjects already diagnosed with COPD did not differ from the whole COPD group.

In an unselected clinic population with arterial vascular disease a majority of people had, mostly undiagnosed, COPD albeit predominantly mild to moderate. Continuation or commencement of beta-blockers had little effect on level of peak exercise or degree of dynamic hyperinflation. This supports the use of beta-blockers in this COPD population, both in a peri-operative setting and for a cardiac indication.

M142 THE ASSOCIATION BETWEEN EXACERBATION FREQUENCY AND STROKE RISK, IN PATIENTS WITH COPD: A MATCHED CASE-CONTROL STUDY

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Introduction and objectives COPD patients have been shown to have a higher incidence of MI and stroke, than the general.¹ There is also evidence that the risk of MI and stroke, in COPD patients, increases following an exacerbation.² However, the association appears stronger between COPD exacerbations and MI, than it does between COPD exacerbations and stroke.^{1,2} We hypothesise that COPD patients, who are frequent exacerbators, have a higher stroke risk, than those who are infrequent exacerbators, even when stable.

Methods COPD patients, with a first stroke between 2004 and 2013, were identified in the UK CPRD database, as cases. Controls, were COPD patients, registered in the CPRD database, matched 3:1, to cases on age, sex and GP practice. We defined “frequent exacerbators” as COPD patients, with ≥ 2 exacerbations, resulting in treatment, per year and “infrequent exacerbators” as ≤ 1 exacerbation, per year. We also grouped exposure into four levels; 0, 1, 2 or ≥ 3 exacerbations, per year, to allow an analysis for trend between exacerbation number and stroke. A subgroup analysis of the association between exacerbation frequency and stroke type (ischaemic/ haemorrhagic or TIA) was also carried out. Conditional logistic regression was used for the analyses.

Results There were 6,441 cases and 19,323 controls. No difference was found in odds of stroke, comparing frequent and infrequent exacerbators (adjusted[‡] OR 0.95, 95% CI 0.89–1.01, p = 0.09), or in the odds for stroke of any type. However, there was a reduction in odds of stroke associated with increased number of exacerbations, per year, with evidence for a linear trend (p = 0.002) (see Table 1.)

Conclusion These findings do not support the hypothesis that exacerbations in COPD are associated with increased stroke risk and warrant further investigation.

[‡]Adjusted for age, sex, general practice, smoking status, family history, hypertension, heart failure, CABG, angina, B-blocker and Calcium channel blocker.

REFERENCES

- 1 Feary, JR, *et al.* Prevalence of major comorbidities in subjects with COPD and incidence of myocardial infarction and stroke: a comprehensive analysis using data from primary care. *Thorax*, 2010;65(11):p. 956-62
- 2 Donaldson, GC, *et al.* Increased risk of myocardial infarction and stroke following exacerbation of COPD. *Chest*, 2010;137(5): p. 1091-7

M143 PROGRESSION OF CENTRAL ARTERIAL STIFFNESS IN COPD AFTER 2 YEARS OF OBSERVATION

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Background COPD is a systemic disease with associated comorbidities including cardiovascular disease which have significant impact on morbidity and mortality. The heterogeneity of COPD has led to the concept of phenotypes; one of which may describe patients at greater cardiovascular risk. Aortic pulse wave velocity (aPWV) is a validated measure of arterial stiffness and an independent predictor of cardiovascular outcomes, and has been shown to be elevated in patients with COPD.¹ We hypothesised that a subgroup of patients (progressors) would demonstrate increased aPWV over 2 years.

Methods The ARCADE study is a longitudinal study of cardiovascular risk and other comorbidities. Assessments include spirometry, BMI, aPWV and blood pressure, (BP), mean arterial