matched control subjects (n = 25). This study is a further analysis of a previous case-control multi modal cranial MRI study.[1]

Main results COPD patients had significantly greater frontal atrophy than control subjects (p = 0.01), this was independent of smoking history, comorbidities and hospital anxiety and depression scores. Cognitive function was significantly worse in the COPD group for executive function, working memory, verbal memory and processing speed. Group differences in atrophy did not seem to account for differences in cognitive function. We were unable to identify meaningful correlations between regional atrophy and disease severity or cognitive function.

Abstract P15 Table 1 Bilaterally summed composite scores for regional atrophy in the control and COPD group (presented as Mean ± SD)

	Control subjects (n=25)	COPD patients (n=25)	P value	Corrected p value**
Frontal	5.08 ± 2.68	7.32 ± 3.26	0.01*	0.02*
Temporal	5.76 ± 3.27	7.72 ± 4.77	0.10	0.06
Hippocampal	4.60 ± 1.89	5.24 ± 3.06	0.38	0.05
Parahippocampal	1.68 ± 1.97	3.72 ± 2.75	0.13	0.005

***Generalised linear model multivariate analysis controlling for group differences in Charlson, pack years and HAD scores.*
**Statistically significant result*

Conclusions There is significant frontal brain atrophy in stable non-hypoxaemic COPD patients. This regional atrophy does not appear to be related to disease severity or cognitive function. Further work is needed to identify causative mechanisms behind this structural change.

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P16 PROSPECTIVE RISK OF OSTEOPOROTIC FRACTURE IN PATIENTS WITH ADVANCED COPD

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Introduction COPD is associated with an increased prevalence of osteoporosis with shared risk factors including smoking, low BMI and reduced mobility. However, the risk of future fractures is not routinely considered in the management of COPD. We aimed to quantify future fracture likelihood and identify factors associated with an increased probability of osteoporotic fractures in patients with advanced COPD.

Methods Patients with advanced COPD were prospectively recruited and underwent a 'comprehensive respiratory assessment' as previously described.[1] The 10 year probability of developing either a major osteoporotic fracture or hip fracture was calculated using the fracture risk assessment tool (FRAX®)[2] using routinely collected data including age, gender, weight, height, smoking history, alcohol use, presence of inflammatory arthritis, corticosteroid use, but with the omission of family history and prior history of fractures. High risk was considered to be a ≥20% probability of a major osteoporotic fracture and ≥5% probability of a hip fracture.

Results 181 patients were included: mean (SD) age of 65 (9) years, MRC score 4 (IQR 0), BMI 25.4 (6.9) kg/m^2, 42% female and 25% current smokers. The mean (SD) 10-year probability for a major osteoporotic fracture was 9.1 (5.1)% and for a hip fracture was 3.5 (3.6)%. 43 (24)% of patients were considered to be high probability of a future fracture.

25 (14%) patients were prescribed a bisphosphonate and 17 (9%) maintenance daily oral prednisolone. Only 4 (24%) patients on oral steroids had a high probability for a future osteoporotic fracture.

The cohort was divided into quartiles based on FRAX® score for future major osteoporotic fractures. There were significant differences between groups in exercise capacity, quadriceps strength, exacerbations, body composition and a trend to home oxygen use (Table 1).

Conclusion A quarter of patients with advanced COPD had a high probability of a future major osteoporotic fracture despite our calculations being an underestimate. An increased likelihood of fracture was associated with a number of potentially modifiable measures including exacerbation frequency, reduced physical performance and reduced skeletal muscle bulk.

REFERENCES

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Abstract P16 Table 1 Characteristics of patients with advanced COPD divided into quartiles based on FRAX® 10 year major osteoporotic fracture risk

	Total (n = 181)	Quartile 1 (n = 45)	Quartile 2 (n = 44)	Quartile 3 (n = 44)	Quartile 4 (n = 48)	P value
FRAX major osteoporotic fracture (%)	9.1 (5.1)	4.3 (0.9)	6.6 (0.6)	8.9 (0.73)	16.0 (4.6)	
FRAX hip fracture (%)	3.5 (3.6)	0.7 (0.4)	1.7 (0.9)	3.3 (1.5)	7.8 (4.1)	<0.001
FEV_1 (L)	0.81 (0.44)	1.05 (0.68)	0.88 (0.32)	0.71 (0.25)	0.66 (0.41)	<0.001
Home oxygen (% yes)	39%	24%	39%	41%	52%	0.057
Exacerbations in previous year	4.7 (4.3)	2.8 (2.8)	5.5 (4.9)	4.8 (3.6)	5.5 (5.1)	0.007
Hospitalisations in previous year	1.3 (2.1)	1.1 (1.7)	1.4 (2.9)	1.3 (1.8)	1.4 (2.1)	0.753
CAT score	25.8 (6.9)	25.8 (7.7)	24.8 (6.8)	26.8 (6.4)	25.8 (6.7)	0.656
Incremental Shuttle Walk Test (m)	150 (110)	220 (160)	160 (80)	110 (60)	90 (40)	<0.001
Quadriceps Strength (Kg)	18.5 (7.3)	23.5 (8.6)	20.0 (6.5)	16.9 (4.6)	13.7 (5.0)	<0.001
Fat Free Mass Index (kg/m^2)	16.4 (2.6)	18.0 (2.8)	17.0 (1.9)	15.9 (2.6)	14.8 (2.0)	<0.001
Skeletal Muscle Index (kg/m^2)	6.1 (1.3)	6.7 (1.2)	6.6 (1.2)	5.8 (1.1)	5.4 (1.1)	<0.001
Total Bone Calcium (Kg)*	2.47 (0.62)	2.75 (0.53)	2.65 (0.48)	2.40 (0.52)	2.10 (0.73)	<0.001
Vitamin D (nmol/l)	29 (26)	30 (28)	29 (24)	34 (28)	22 (25)	0.220

Quartile 1 is the lowest risk and quartile 4 is the highest risk. Data are mean (SD). *calculated from DEXA.