Baseline quantitative computed tomography scores in patients with idiopathic pulmonary fibrosis (IPF) and progressive pulmonary fibrosis (PPF) in the FIBRONEER-IPF and FIBRONEER-ILD trials.

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Objective

We assessed quantitative CT parameters, and correlations between quantitative CT parameters and FVC, at baseline of the FIBRONEER-IPF and FIBRONEER-ILD trials.

Introduction

- There is increasing interest in using quantitative CT parameters as measures of the severity and progression of ILD in clinical trials.[1-3]
- More information is needed on associations between quantitative CT parameters and other measures of ILD severity, such as FVC.

Methods

Patients

- Participants in the FIBRONEER-IPF trial had IPF and could be taking no antifibrotic therapy or be taking nintedanib or pirfenidone.[4]
- Participants in the FIBRONEER-ILD trial had an ILD other than IPF, met criteria for ILD progression within the prior 24 months, and had an extent of fibrotic lung disease >10% on a high-resolution CT taken ≤12 months prior to screening. Background therapy with nintedanib was allowed.[5]

Quantitative CT parameters

- We evaluated quantitative CT parameters (measured in mL and as % of the whole lung) using the UCLA algorithm.[6] This algorithm classifies abnormal lung tissue based on pixel density or texture to give the following scores:
  – Quantitative lung fibrosis (QLF) score: extent of reticular patterns with architectural distortion due to fibrosis
  – Quantitative honeycomb cysts (QHC) score: extent of honeycomb cysts
  – Quantitative ground glass opacities (QGGO) score: extent of ground glass opacities
  → The total of these scores is the quantitative ILD (QILD) score
- Total lung capacity is also measured.

Analyses

- We analyzed correlations (r) between quantitative CT parameters and FVC % predicted at baseline in the FIBRONEER-IPF and FIBRONEER-ILD trials.

Results

Baseline characteristics of patients in the FIBRONEER-IPF trial (N=1177)

Male: 83.0%	Mean age: 70.2 years	Mean 3.5 years since diagnosis of IPF	Mean FVC: 78.2% predicted	Mean DLco: 50.9% predicted	Supplemental oxygen: 21.1%	Nintedanib: 45.5% Pirfenidone: 32.3% Neither: 22.3%

Baseline characteristics of patients in the FIBRONEER-ILD trial (N=1176)

Male: 55.6%	Mean age: 66.4 years	Mean 4.2 years since diagnosis of ILD	Mean FVC: 70.1% predicted	Mean DLco: 49.3% predicted	Supplemental oxygen: 27.6%	Nintedanib: 43.7%* No background therapy: 56.3%

*Two patients took pirfenidone rather than nintedanib.

Quantitative CT parameters at baseline

	FIBRONEER-IPF	FIBRONEER-ILD
Total lung capacity, mL	4073 (989)	3506 (957)
QGGO score, mL	583 (220)	608 (251)
QLF score, mL	568 (298)	528 (290)
QHC score, mL	77 (126)	41 (84)
QILD score, mL	1228 (475)	1177 (468)
QGGO score, %	14.9 (5.8)	18.0 (7.0)
QLF score, %	15.0 (8.9)	16.2 (9.7)
QHC score, %	1.9 (3.1)	1.1 (2.2)
QILD score, %	31.8 (13.7)	35.3 (14.5)

Data are mean (SD). FIBRONEER-IPF: n=1113. FIBRONEER-ILD: n=1098 for values in mL; n=1099 for values in %.

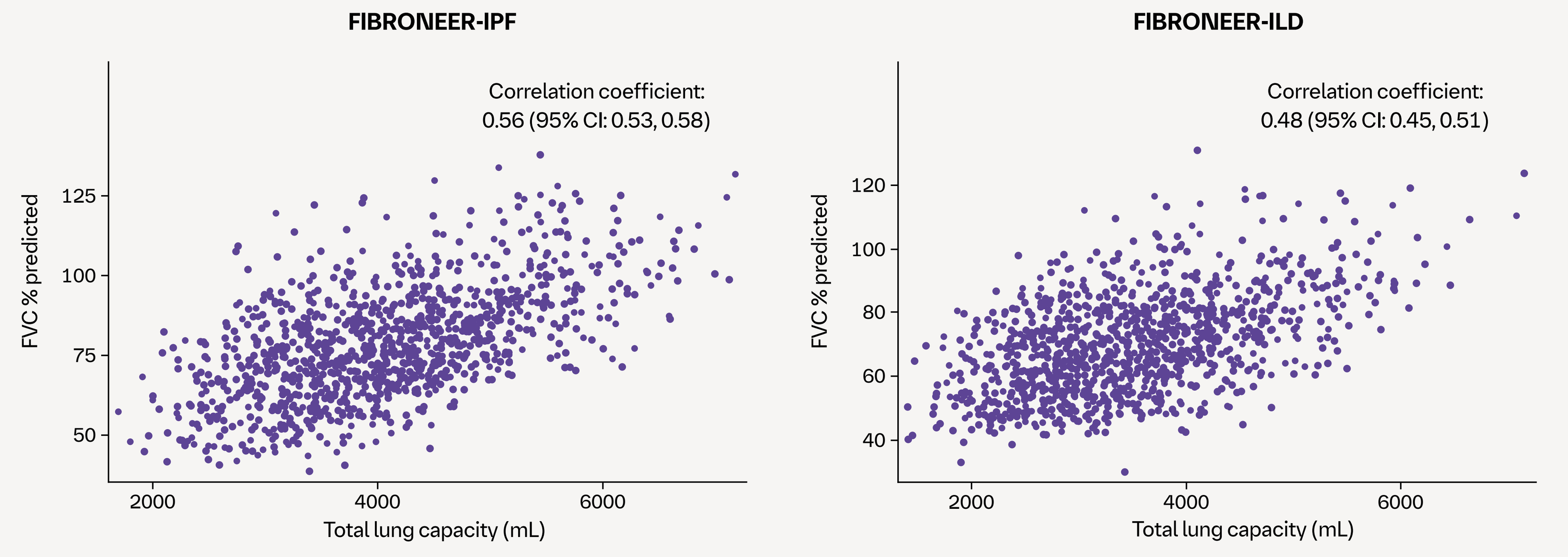
Correlations between quantitative CT parameters and FVC % predicted at baseline

	Correlation coefficient (95% CI)	
	FIBRONEER-IPF	FIBRONEER-ILD
Total lung capacity, mL	0.56 (0.53, 0.58)	0.48 (0.45, 0.51)
QGGO score, mL	−0.06 (−0.10, −0.02)	0.05 (0.01, 0.08)
QLF score, mL	−0.37 (−0.40, −0.33)	−0.27 (−0.31, −0.23)
QHC score, mL	0.14 (0.10, 0.18)	0.18 (0.14, 0.21)
QILD score, mL	−0.23 (−0.26, −0.19)	−0.13 (−0.17, −0.09)
QGGO score, %	−0.39 (−0.42, −0.36)	−0.28 (−0.32, −0.25)
QLF score, %	−0.54 (−0.57, −0.51)	−0.45 (−0.48, −0.42)
QHC score, %	0.07 (0.04, 0.11)	0.12 (0.08, 0.16)
QILD score, %	−0.51 (−0.53, −0.48)	−0.42 (−0.45, −0.38)

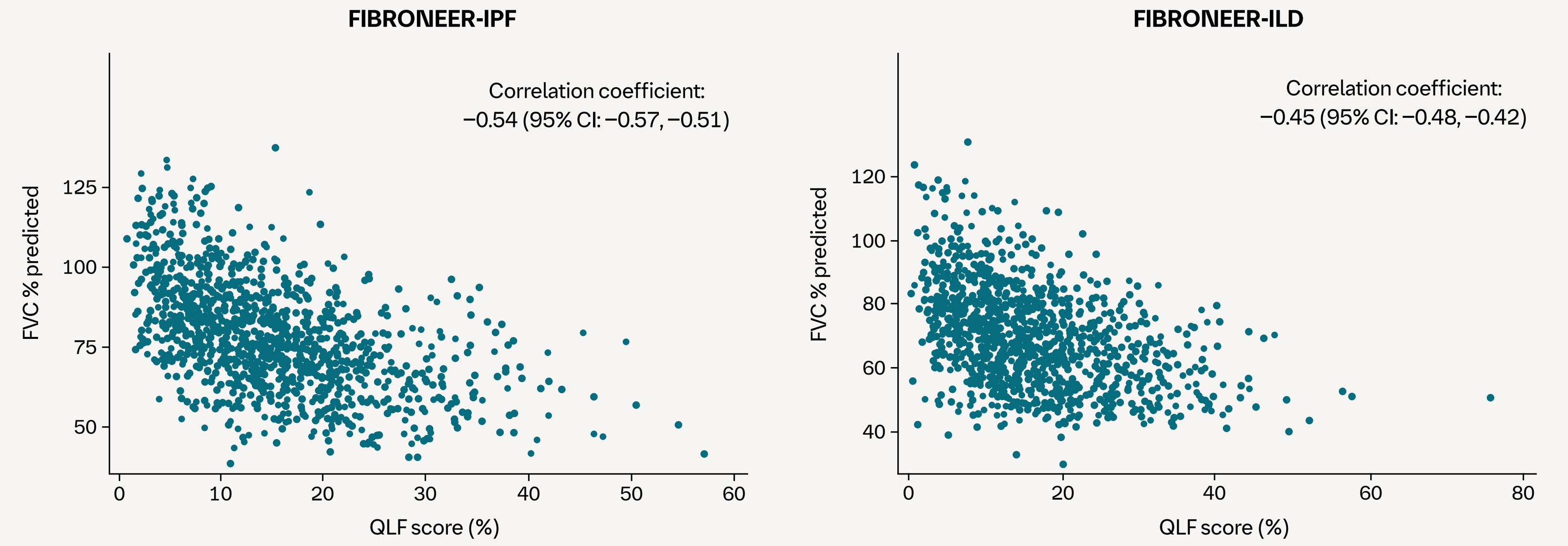
≥0.3 to <0.6 ≥0 to <0.3 ≥−0.3 to <0 ≥−0.6 to <−0.3

FIBRONEER-IPF: n=1113. FIBRONEER-ILD: n=1098 for correlations with CT parameters in mL; n=1099 for correlations with CT parameters in %.

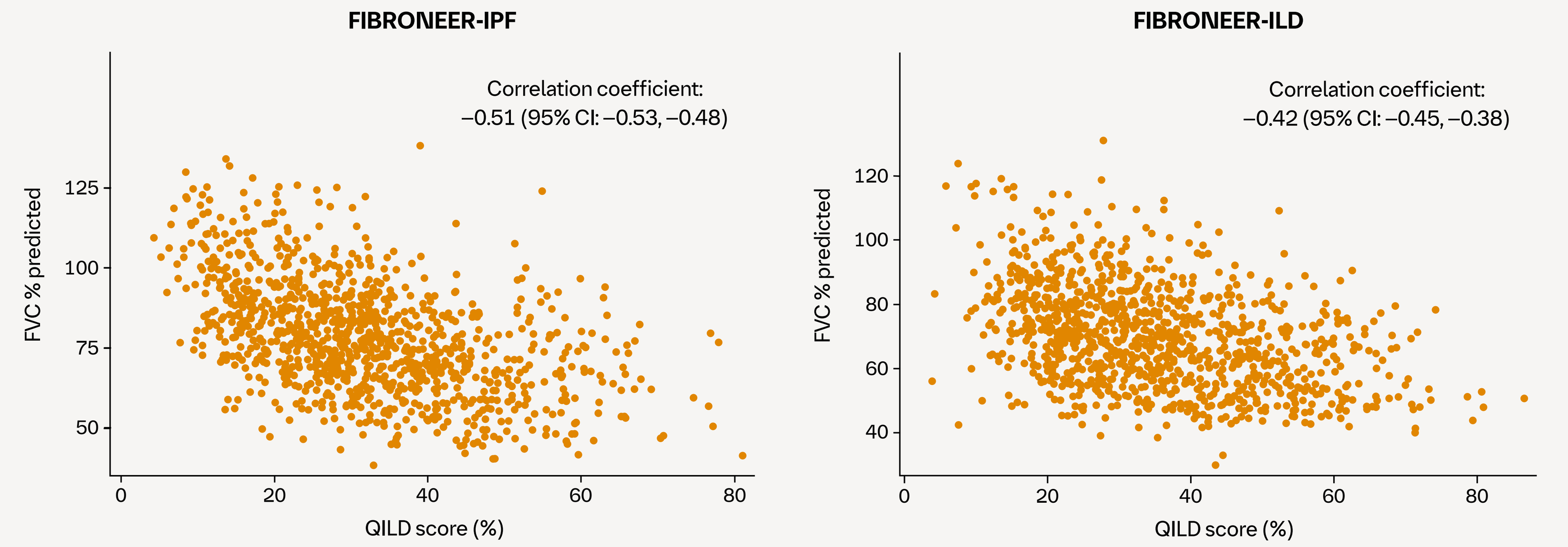
Correlations between total lung capacity and FVC % predicted at baseline



Correlations between QLF score (%) and FVC % predicted at baseline



Correlations between QILD score (%) and FVC % predicted at baseline



Conclusions

- At baseline of the FIBRONEER-IPF and FIBRONEER-ILD trials, correlations between quantitative CT assessments and FVC % predicted were weak to moderate.
- The findings suggest that quantitative CT measures provide complementary information to that provided by FVC.
- Further work will evaluate changes in quantitative CT measures and how these relate to changes in FVC and mortality.

Abbreviations

CI, confidence interval. CT, computed tomography. DLco, capacity of the lungs for carbon monoxide. FVC, forced vital capacity. ILD, interstitial lung disease. IPF, idiopathic pulmonary fibrosis. QGGO, quantitative ground glass opacities. QHC, quantitative honeycomb cysts. QILD, quantitative interstitial lung disease. QLF, quantitative lung fibrosis. SD, standard deviation. UCLA, University of California Los Angeles.

References

1. Kim GHJ et al. Ther Adv Respir Dis 2021;15:17534666211004238; 2. Lancaster L et al. Am J Respir Crit Care Med 2024;210:424–434; 3. Kim GH et al. BMJ Open 2025;15:e094559; 4. Richeldi L et al. N Engl J Med 2025;392:2193–2202; 5. Maher TM et al. N Engl J Med 2025;392:2203–2214; 6. Kim HG et al. Clin Exp Rheumatol 2010;28:S26–35.

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