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Overlapping With Chronic Obstructive Pulmonary Disease as a Phenotype of Bronchiectasis for Long-term Clinical Prediction

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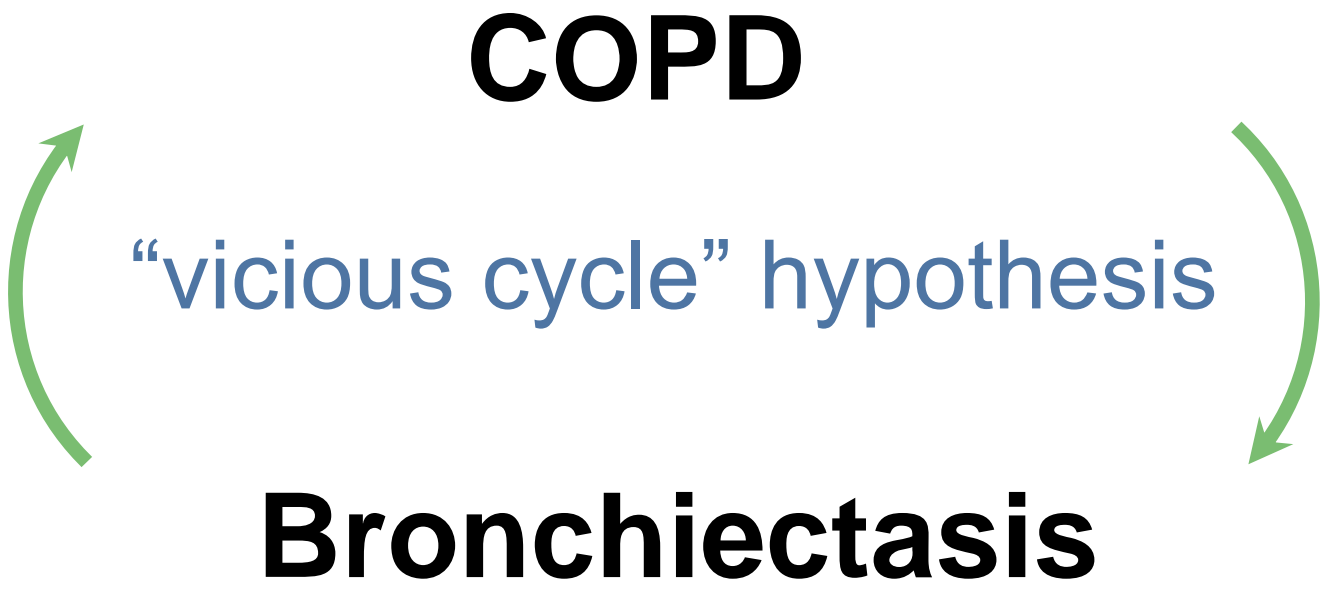
Bronchiectasis

Bronchiectasis-COPD overlap syndrome (BCOS)

- ❑ First introduced in 2006
- ❑ With a prevalence of 28-60%
- ❑ Lack of a guideline to cover clinical practice at present

COPD

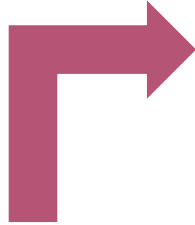
Causal association



To date was **Not clear**

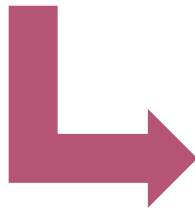
Blasi, F., Chalmers, J. D., & Aliberti, S. (2014). COPD and Bronchiectasis: Phenotype, Endotype or Co-morbidity? COPD: Journal of Chronic Obstructive Pulmonary Disease, 11(6), 603–604

Causal association is not clear



Phenotype of COPD
Mainstream

COPD–bronchiectasis
overlap syndrome



Phenotype of bronchiectasis
Rarely mentioned

Evaluation for Clinical outcome(1)

Bronchiectasis Aetiology Comorbidity Index



COPD was calculated with high score

predict mortality and exacerbation rates for 5 years

Clinical features and long-term medication was not yet evaluated much

Evaluation for Clinical outcome(2)

- ① FACED score
- ② Bronchiectasis Severity Index (BSI)



Bronchiectasis extension was evaluate

predictors of four-year **hospitalization rate**
and **mortality**

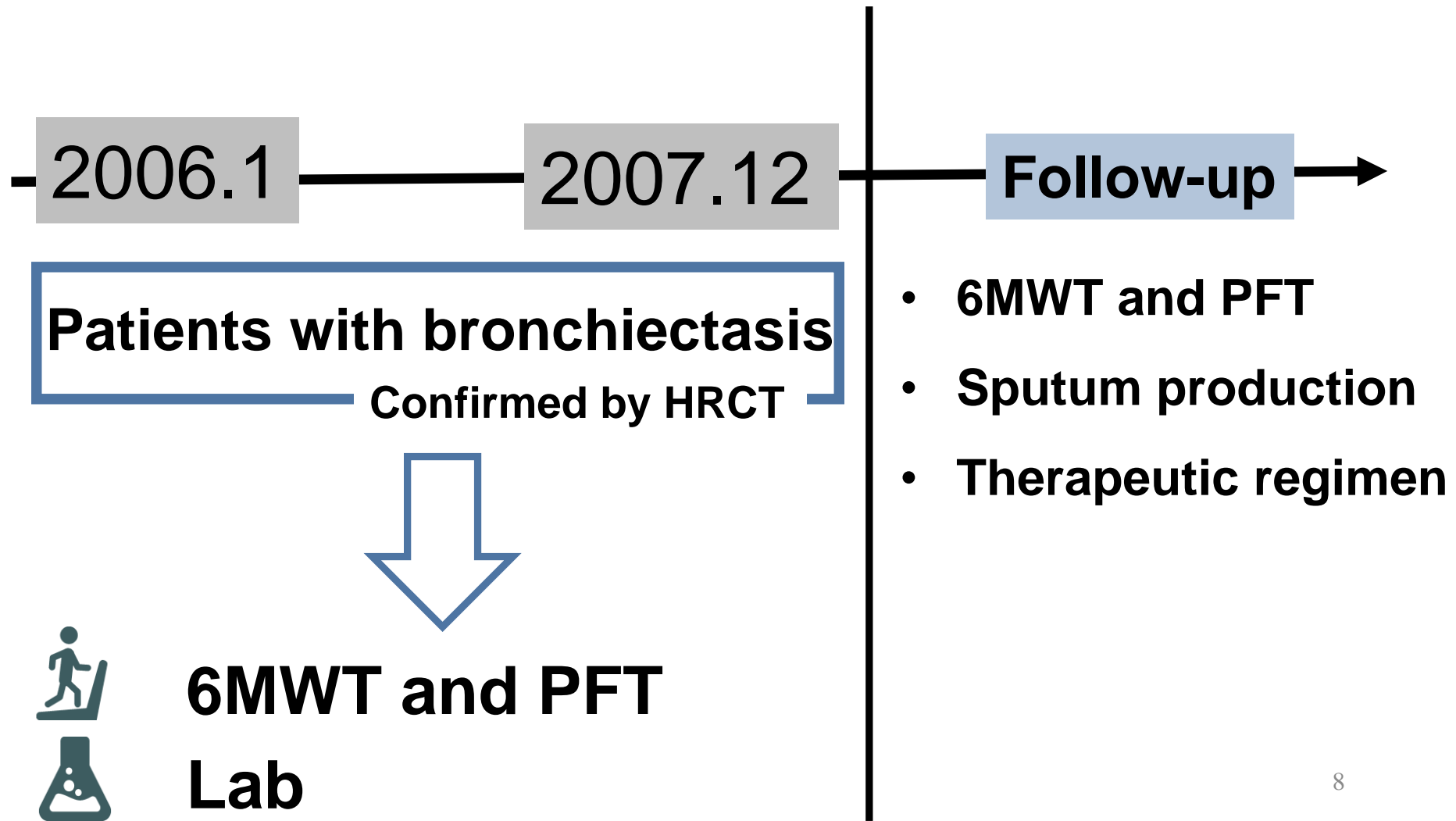


Aim

to investigate...

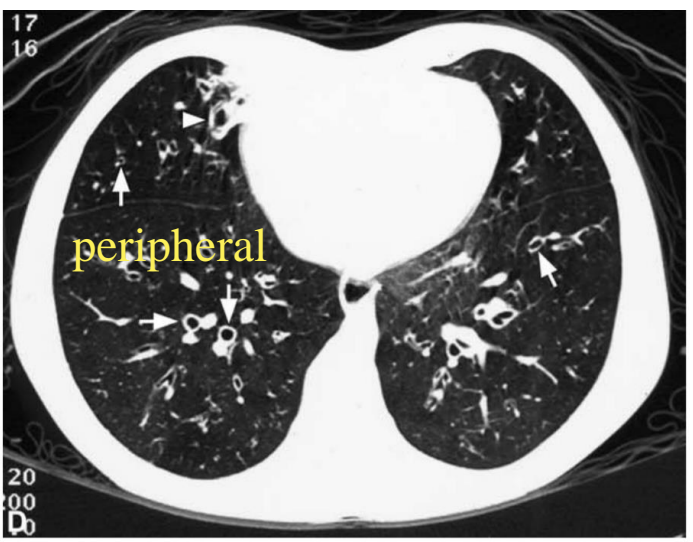
- **Impact of COPD** on bronchiectasis patients with a 10-year follow-up
- Correlation between **extension of bronchiectasis** and **clinical prognosis**

Study Design



Extent of Bronchiectasis: Brody scoring system (partial)

Bronchiectasis score (range, 0–12)	=	Extent of bronchiectasis in central lung	+	Extent of bronchiectasis in peripheral lung	×	Average bronchiectasis size multiplier
		0 = none		0 = none		Average Multiplier size
		1 = 1/3 of lobe		1 = 1/3 of lobe		0.5 = 0
		2 = 1/3-2/3 of lobe		2 = 1/3-2/3 of lobe		1 = 1
		3 ≥2/3 of lobe		3 ≥2/3 of lobe		1.5 = 1.25
						2.0 = 1.5
						2.5 = 1.75
						3 = 2



Full score: 12x6=72

Brody, A. S., et al. (2004). High-resolution computed tomography in young patients with cystic fibrosis: distribution of abnormalities and correlation with pulmonary function tests. *The Journal of pediatrics*, 145(1), 32-38.

Parameters for Serial Follow-up

PFT and 6MWT

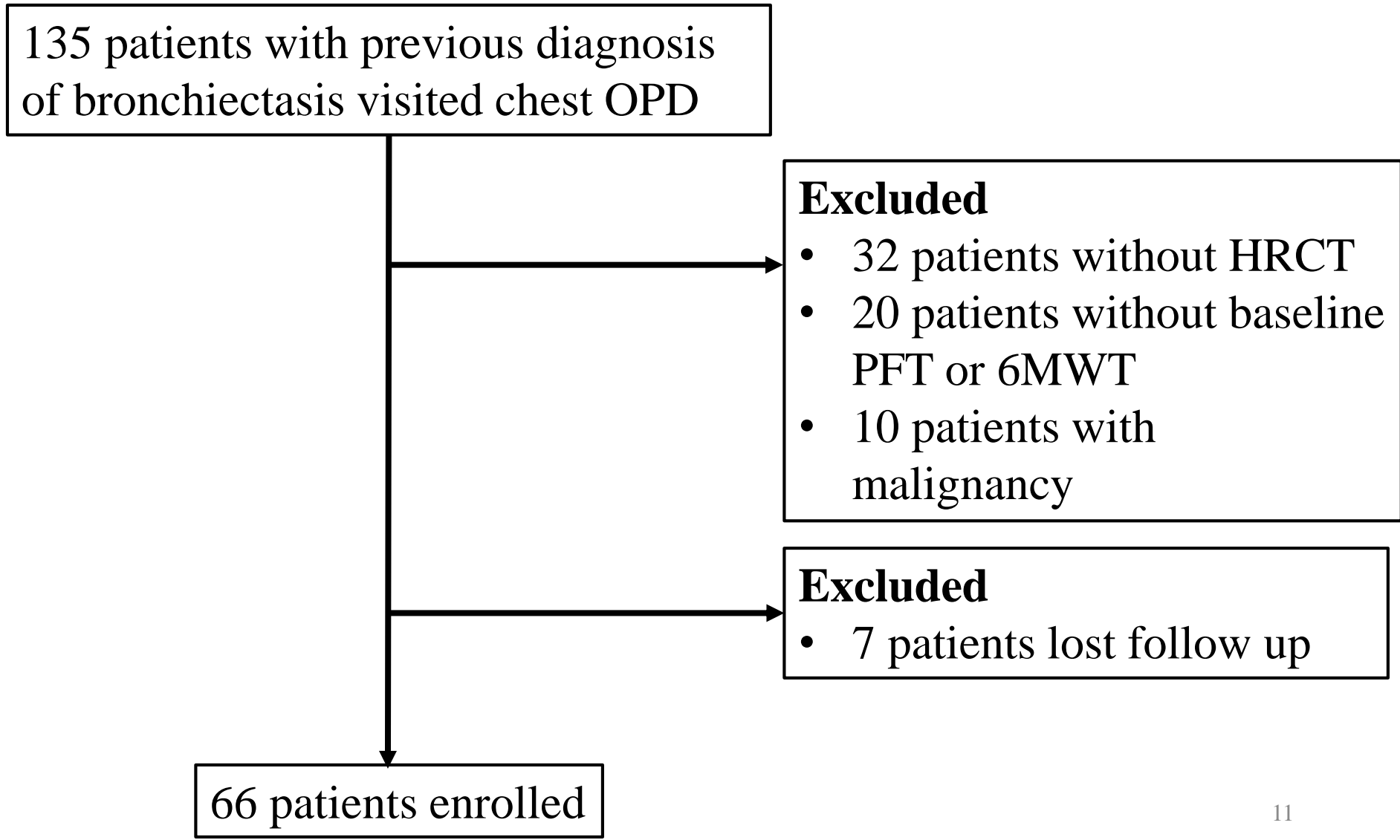
PFT: FVC%, FEV1%, FEV1/FVC

6MWT: walking distance, baseline & post-test SpO2

Sputum culture results

Inhaled medications

Flowchart of Patient Selection



Final analyzed group

Patients with bronchiectasis

with COPD
N = 21

V.S.

without COPD
N = 45

Demographic data

	without COPD N = 45	with COPD N = 21	P-value
Age	58.20 ± 12.81	56.95 ± 15.47	0.732
Male	53.3%	57.1%	0.772
BMI	22.62 ± 3.55	20.90 ± 2.91	0.057
Smoke	15.5%	23.8%	0.313

Initial HRCT image

	without COPD N = 45	with COPD N = 21	P-value
Bronchiectasis extension score	21.89 ± 10.08	32.21 ± 13.09	<0.01*

Progression of PFT and 6MWT Results

	without COPD N = 45	with COPD N = 21	P-value
Δ FVC/year (L/yr)	-0.08 \pm 0.17	-0.03 \pm 0.17	0.166
Δ FVC PRE/year (%/yr)	-0.74 \pm 7.76	-0.66 \pm 5.31	0.161
Δ FEV1/year (L/yr)	-0.42 \pm 0.13	0.93 \pm 3.88	0.421
FEV1 PRE/year (%/yr)	-0.38 \pm 8.36	-0.34 \pm 3.30	0.947
Δ 6MWT/year (m/yr)	-11.85 \pm 47.61	18.35 \pm 23.73	0.164
Δ SpO2 decrease/year (%/yr)	0.31 \pm 2.93	1.35 \pm 3.20	0.205

Sputum production

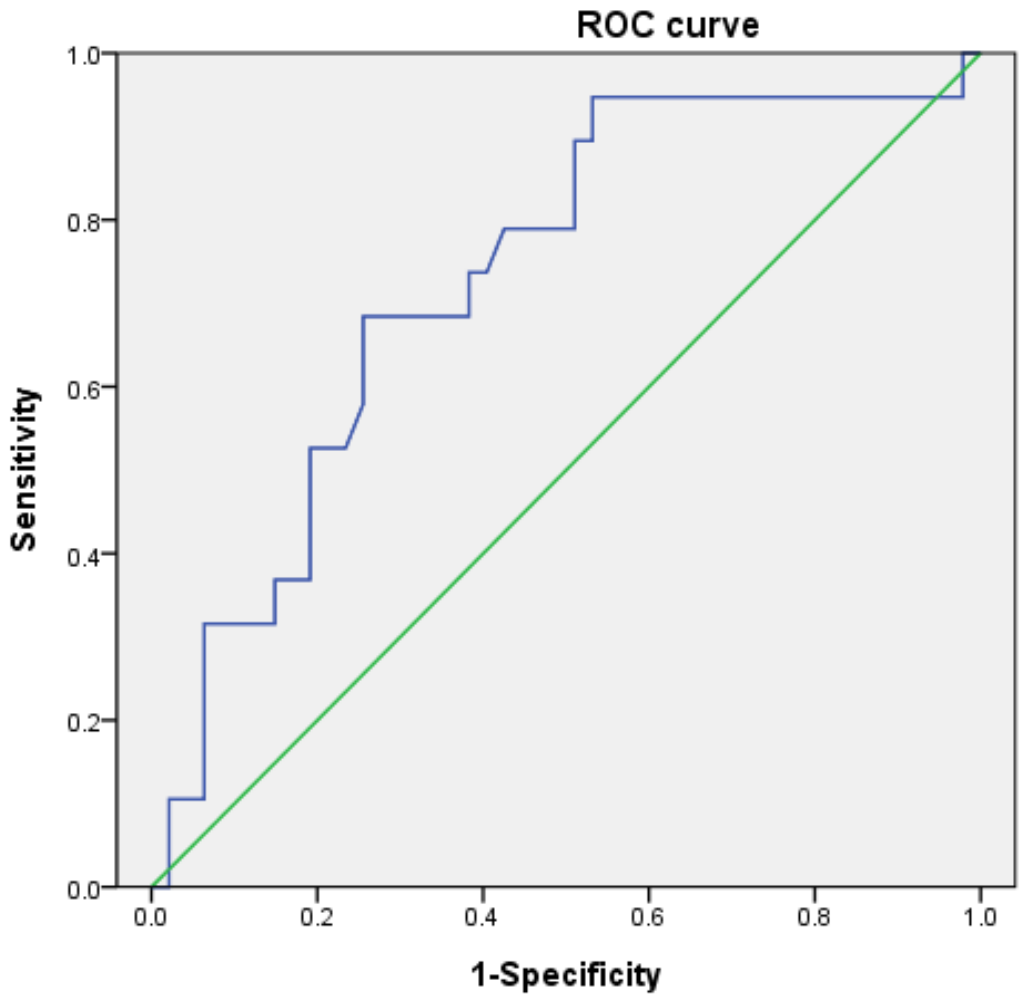
	without COPD N = 45	with COPD N = 21	P-value
Frequent sputum production			
Initial	66.7%	95.2%	0.012
3 year later	81.6%	82.3%	0.945

Culture of *Pseudomonas aeruginosa*

	without COPD N = 45	with COPD N = 21	P-value
Positive result during follow-up	22.2%	42.9%	0.126

Multivariate analysis for predicting *Pseudomonas* colonization

	OR	95% CI	P-value
With COPD	1.54	0.44 - 5.32	0.50
Bronchiectasis extension score	1.06	1.00 – 1.12	0.031



24.12 may be a cut-off point of pseudomonas colonization on patient with bronchiectasis regardless of comorbid with COPD


Correlation between extension score and Variation in PFT&6MWT Outcomes

Correlation coefficient (P value)

	without COPD	with COPD	Overall
Δ FVC/year (L/year)	-0.17(0.31)	0.82 (0.75)	-0.05 (0.74)
Δ FVC PRE/year (%/year)	-0.17(0.31)	1.99 (0.44)	-0.04 (0.78)
Δ FEV1/year(L/year)	-0.09(0.60)	0.35 (0.17)	0.56 (0.69)
FEV1 PRE/year(%/year)	-0.15(0.36)	0.34 (0.21)	0.02 (0.89)
Δ 6MWT/year(m/year)	0.07(0.98)	0.32 (0.45)	0.17 (0.92)
Δ saturation loss/year (%/year)	-0.61(0.77)	0.08 (0.84)	0.09 (0.62)

Initial extension score had **no relation** to prognosis of pulmonary function

Clinical treatment

	without COPD N = 45	with COPD N = 21	P-Value
LABA ± ICS use initially	22.2%	52.3%	0.020*
LABA ± ICS use after 3 years	28.9%	70.5%	0.030*
LABA ± ICS use after 5 years	24.2%	64.7%	0.012*
LABA ± ICS use after 10 years	 40%	57.7%	0.195

Time changes treatment

Treatment with LABA \pm ICS was increasingly applied to bronchiectasis patients at 10th year.

bronchiectasis

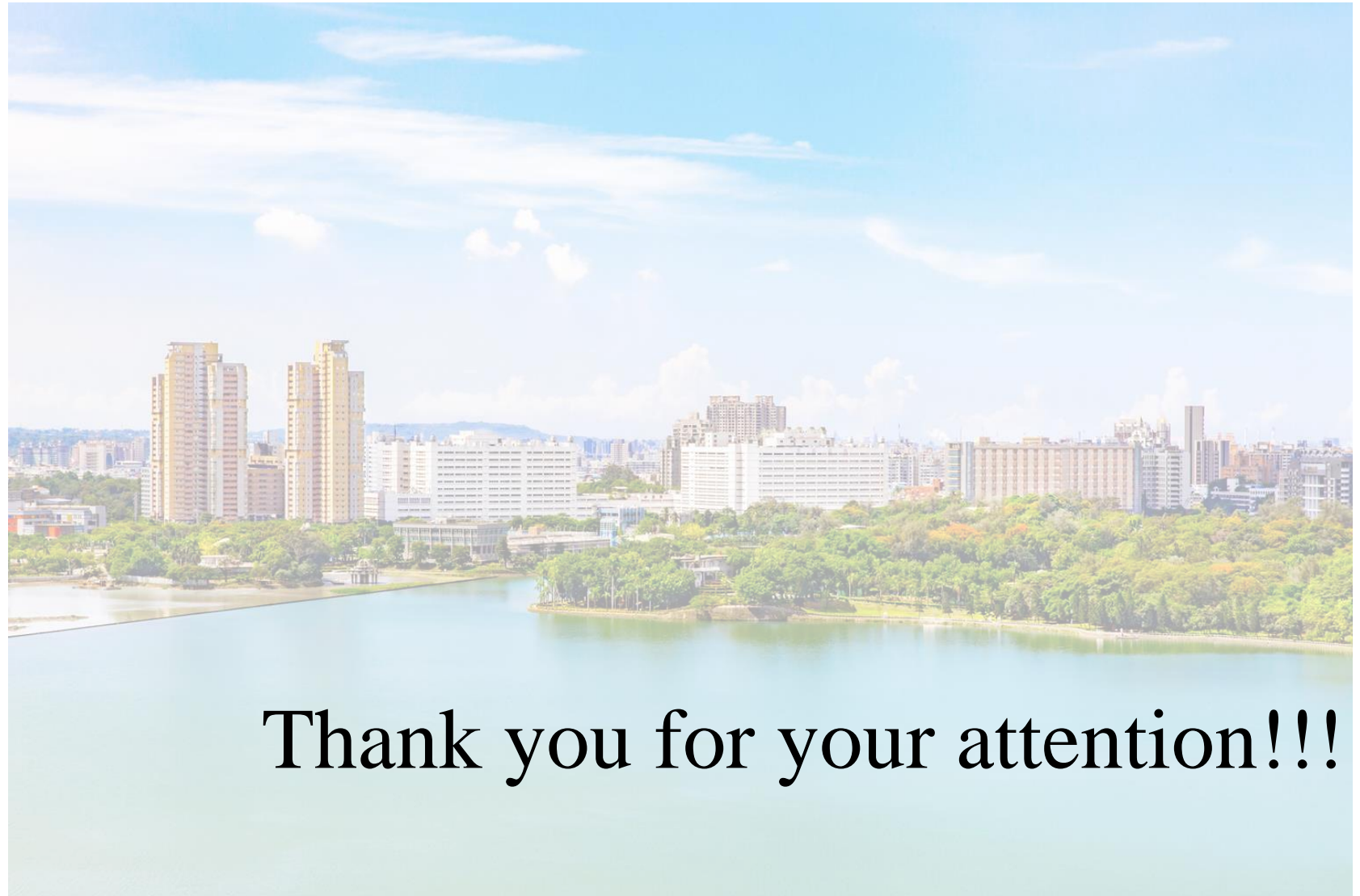
BCOS

Proportion of using bronchodilator and/or inhaled corticosteroid

Conclusion

- ① Bronchiectasis plus COPD had **higher** extension score
- ② **Extension score** correlated with *Pseudomonas* colonization
- ③ Bronchiectasis patient with COPD had no more *Pseudomonas* colonization rate than bronchiectasis alone patient.

Initial bronchiectasis extension was **discordant** to pulmonary functional prognosis



Thank you for your attention!!!