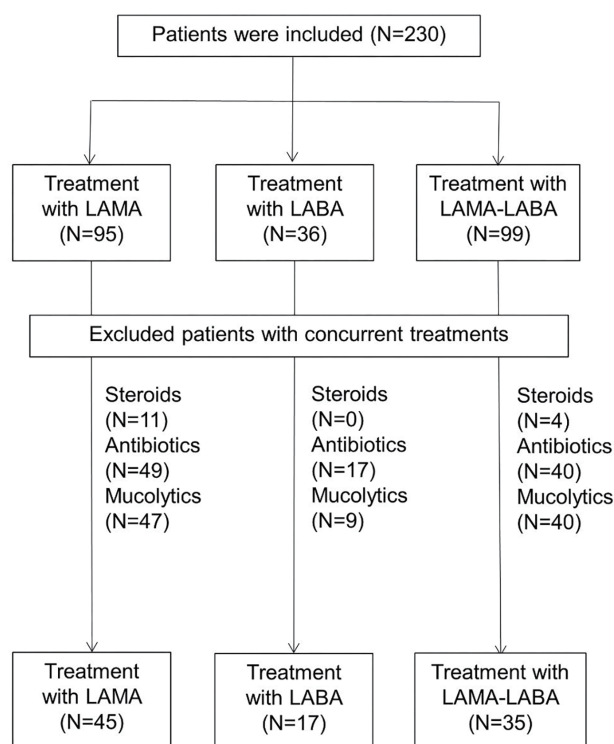


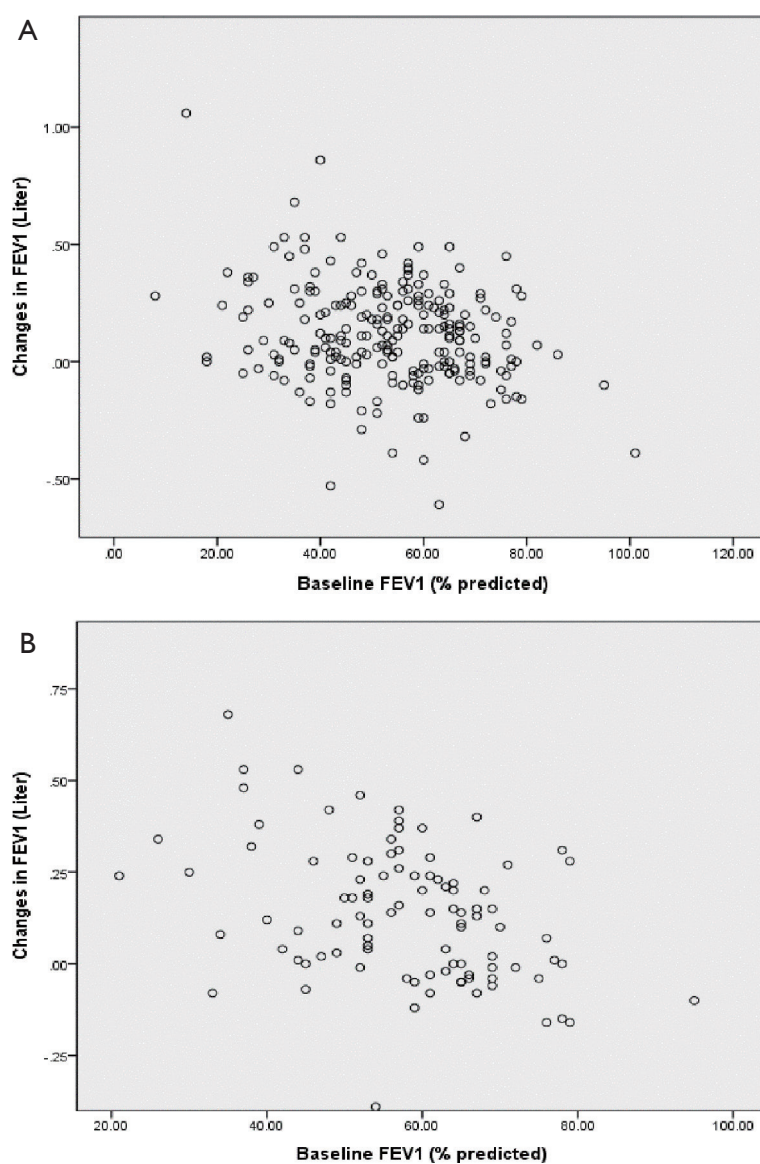
**Table S1** Baseline characteristics of patients without concurrent treatments (N=97)

Characteristics	All patients	Treatment with LAMA	Treatment with LABA	Treatment with LAMA-LABA
Number of patients	97	45	17	35
Age <sup>a</sup> , years	63 (55.5–68)	63 (56–67.5)	57 (50–63.5)	64 (55–70)
Male sex, %	34 (35.1%)	16 (35.6%)	6 (35.3%)	12 (34.30%)
Body mass index <sup>a</sup> , kg/m <sup>2</sup>	23 (21.3–25.3)	22.8 (21.3–25.3)	22.8 (20.2–23.9)	24 (21.5–27.2)
mMRC dyspnea scale				
0	38 (39.2%)	18 (40%)	11 (64.7%)	9 (25.7%)
1	38 (39.2%)	22 (48.9%)	4 (23.5%)	12 (34.3%)
2	11 (11.3%)	4 (8.9%)	1 (5.9%)	6 (17.1%)
3	1 (1.0%)	0 (0%)	0 (0%)	1 (2.9%)
4	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Coexisting pulmonary comorbidities				
Past tuberculosis infection	20 (20.6%)	9 (20%)	4 (23.5%)	19 (19.2%)
Past or current NTM infection	11 (11.3%)	4 (8.9%)	2 (11.8%)	11 (11.1%)
Extrapulmonary comorbidities				
Hypertension	29 (29.9%)	10 (22.2%)	6 (35.3%)	34 (34.3%)
Diabetes mellitus	18 (18.6%)	7 (15.6%)	5 (29.4%)	14 (14.1%)
Cardiocerebrovascular disease	4 (4.1%)	2 (4.4%)	1 (5.9%)	9 (9.1%)
Chronic kidney disease	3 (3.1%)	0 (0%)	1 (5.9%)	5(5.1%)
Baseline lung function <sup>b</sup>				
FEV <sub>1</sub> , liter	1.50±0.42	1.58±0.37	1.59±0.43	1.23±0.44
FEV <sub>1</sub> , % predicted	57.7±12.9	61.0±10.3	58.5±17.1	47.6±15.0
FVC, liter	2.49±0.61	2.5±0.54	2.47±0.61	2.25±0.79
FVC, % predicted	72.5±12.3	73±11.5	70.2±13.4	65.7±17.0
FEV <sub>1</sub> /FVC	0.608±0.11	0.635±0.086	0.653±0.128	0.56±0.12

Data are presented as numbers (%) unless specified otherwise. <sup>a</sup>, median(interquartile range); <sup>b</sup>, mean ± standard deviation. LAMA, long-acting muscarinic antagonist; LABA, long-acting beta-2 agonist; NTM, nontuberculous mycobacteria; FEV<sub>1</sub>, forced expiratory volume in 1 second; FVC, forced vital capacity.

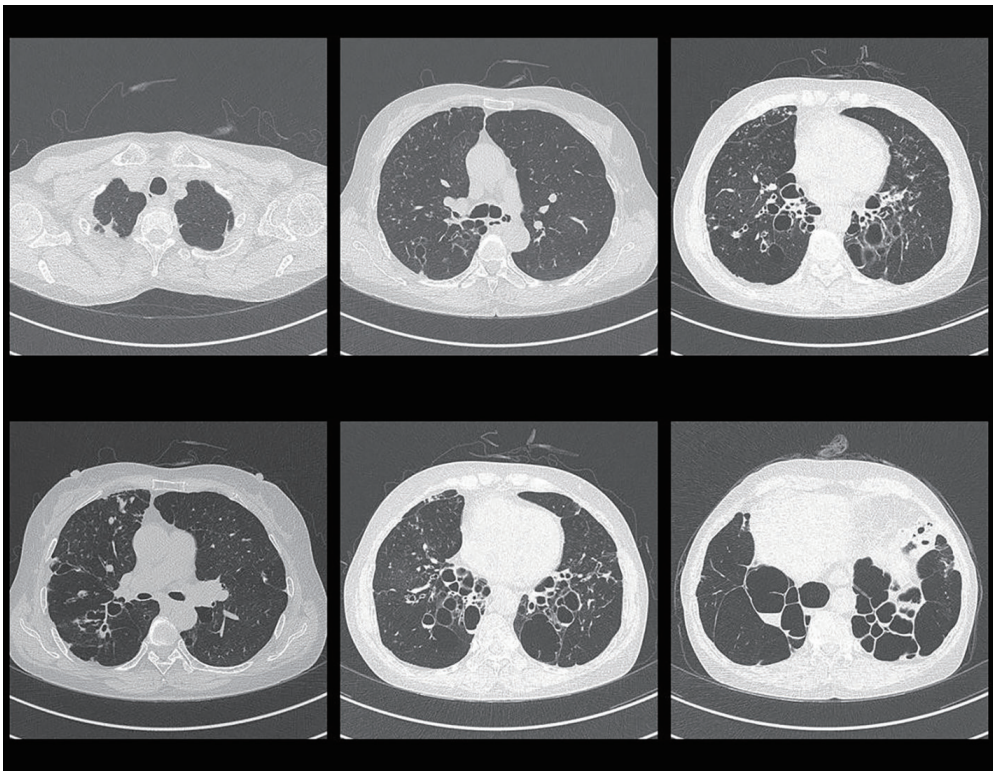


**Figure S1** Patients selection flow after excluding patients treated with other medications. LAMA, long- acting muscarinic antagonist; LABA, long-acting beta-agonists.

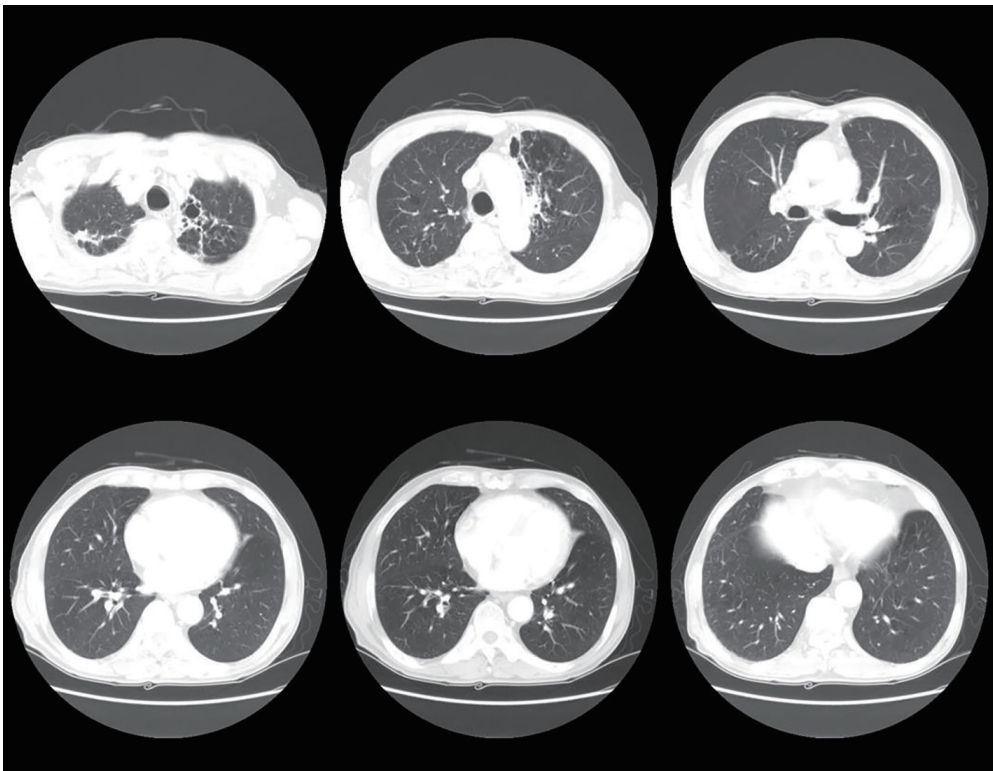


**Figure S2** Scatter plot of baseline FEV1 and FEV1 changes after LAMA, LABA or LAMA-LABA treatment in (A) all patients (N=230,  $R=-0.242$ ,  $P<0.001$ ) and (B) patients without concurrent treatments (N=97,  $R=-0.386$ ,  $P<0.001$ ). FEV<sub>1</sub>, forced expiratory volume in 1 second; LAMA, long-acting muscarinic antagonist; LABA, long-acting beta-agonists.

Appendix 1 The CT scans of five patients with emphysema  
<Patient 1>

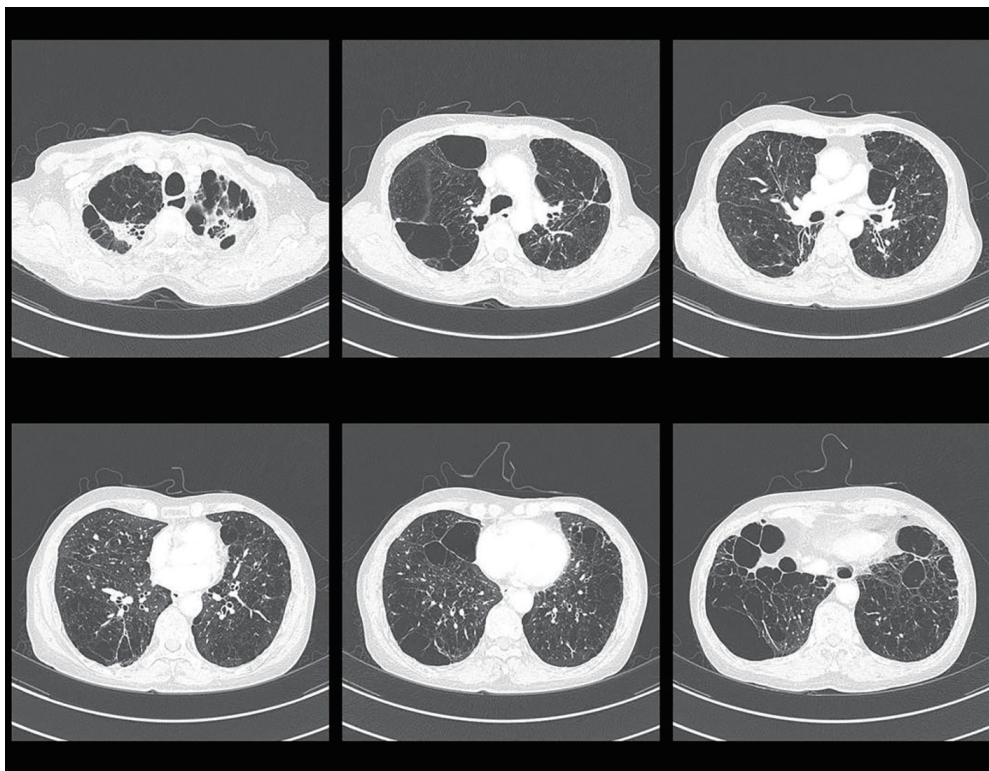


<Patient 2>

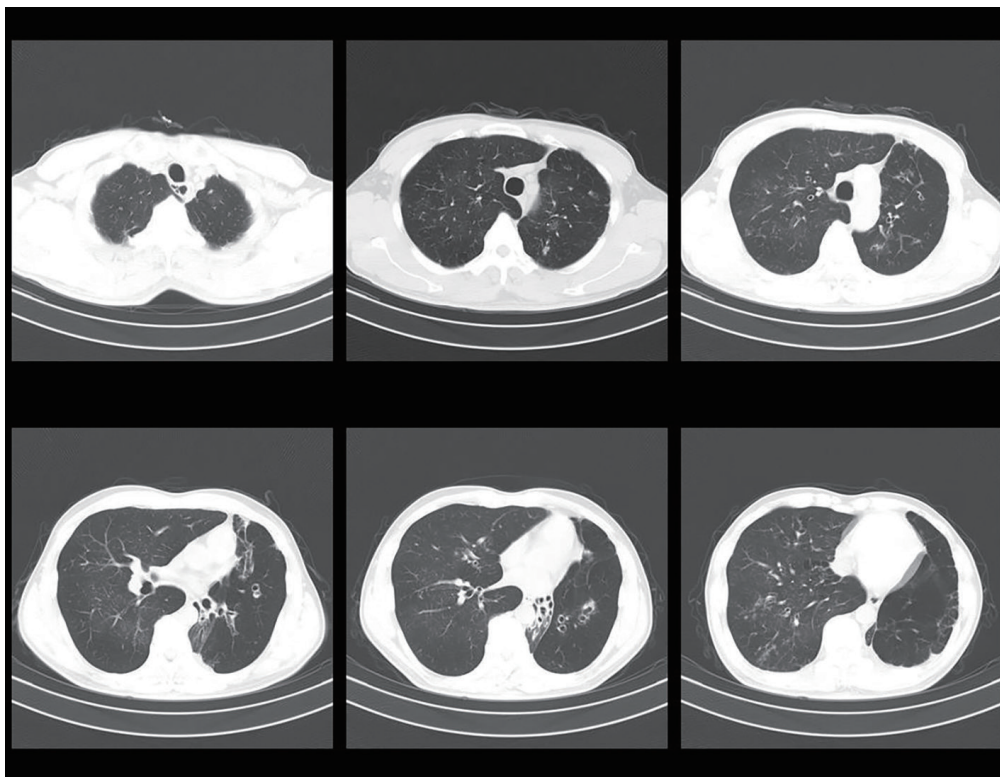




<Patient 3>



<Patient 4>



<Patient 5>

