

Table S1. The association of covariates in logistical regression model with future exacerbation

Variables	Exacerbation $\geq 1/y$ (%)	P value	Severe exacerbation (%)	P value	Exacerbation $\geq 2/y$ (%)	P value
All patients						
Male (vs. female)	0.51 (0.14-1.79)	0.304	0.45 (0.1-1.88)	0.288	0.49 (0.02-6.16)	0.592
Age (per years)	0.99 (0.96-1.02)	0.533	0.99 (0.96-1.03)	0.728	0.99 (0.95-1.04)	0.757
BMI (per kg/m ²)	0.99 (0.93-1.06)	0.83	0.98 (0.91-1.05)	0.491	0.98 (0.88-1.09)	0.715
Exacerbation in the preceding year (Yes vs. No)	3.02 (1.82-5.05)	<0.001	3.22 (1.91-5.43)	<0.001	3.61 (1.8-7.12)	<0.001
Smoking status (%)						
Never smoked	1		1		1	
Former smoking	1.36 (0.46-4.51)	0.595	1.91 (0.56-8.06)	0.332	3.36 (0.49-70.06)	0.297
Current smoking	1.24 (0.45-3.89)	0.694	1.45 (0.46-5.84)	0.557	2.59 (0.41-52.26)	0.402
Smoking index (per pack-yr)	1.00 (0.99-1.01)	0.843	1.00 (0.99-1.01)	0.68	1.00 (0.98-1.01)	0.439
FEV ₁ % pred (per percentage)	0.99 (0.98-1.00)	0.098	0.99 (0.98-1.00)	0.065	0.99 (0.97-1.00)	0.119
High neutrophil proportion level (vs. low neutrophil proportion level)	1.41 (0.95-2.09)	0.090	1.68 (1.09-2.62)	0.020	1.28 (0.67-2.51)	0.460
Inhaled medications (Yes vs No)	1.43 (0.69-2.92)	0.329	1.66 (0.77-3.44)	0.182	1.59 (0.54-4.07)	0.367
Patients with Air trapping						
Male (vs. female)	0.4 (0.04-3.19)	0.402	1.11 (0.09-12.83)	0.932	-	0.989
Age (per years)	0.99 (0.95-1.03)	0.468	1.00 (0.95-1.04)	0.857	1.01 (1.07-1.03)	0.794
BMI (per kg/m ²)	0.96 (0.88-1.04)	0.327	0.96 (0.88-1.05)	0.413	1.03 (1.16-1.04)	0.647
Exacerbation in the preceding year (Yes vs. No)	2.23 (1.24-4.02)	0.007	2.72 (1.49-4.97)	0.001	3.64 (7.8-4.02)	0.001
Smoking status (%)						
Never smoked	1		1		1	
Former smoking	3.58 (0.71-28.36)	0.159	2.64 (0.51-21.56)	0.293	-	0.989
Current smoking	2.18 (0.46-16.75)	0.375	1.49 (0.3-11.81)	0.656	-	0.989
Smoking index (per pack-yr)	0.99 (0.98-1.00)	0.125	0.99 (0.98-1.00)	0.221	0.99 (1.01-1)	0.351

FEV ₁ % pred (per percentage)	0.99 (0.97-1.00)	0.069	0.99 (0.97-1.00)	0.070	0.98 (1-1)	0.079
High neutrophil proportion level (vs. low neutrophil proportion level)	1.69 (1.01-2.84)	0.046	1.79 (1.03-3.15)	0.042	1.04 (2.28-2.84)	0.912
Inhaled medications (Yes vs No)	1.97 (0.86-4.54)	0.108	1.96 (0.83-4.55)	0.119	1.48 (4.23-4.54)	0.493
Non-Air trapping group						
Male (vs. female)	0.60 (0.11-3.00)	0.540	0.27 (0.03-1.72)	0.194	1.5 (0.04-47.83)	0.194
Age (per years)	0.99 (0.94-1.05)	0.792	0.99 (0.93-1.05)	0.66	0.94 (0.85-1.04)	0.66
BMI (per kg/m ²)	1.04 (0.92-1.17)	0.508	0.98 (0.86-1.12)	0.756	0.86 (0.65-1.08)	0.756
Exacerbation in the preceding year (Yes vs. No)	9.01 (2.78-35.48)	0.001	5.66 (1.77-18.5)	0.003	2.23 (0.23-13.02)	0.003
Smoking status (%)						
Never smoked	1		1		1	
Former smoking	0.37 (0.06-2.27)	0.265	0.79 (0.1-8.57)	0.832	0.66 (0.03-27.21)	0.832
Current smoking	0.76 (0.18-3.79)	0.719	1.31 (0.23-11.64)	0.782	0.51 (0.04-15.76)	0.782
Smoking index (per pack-yr)	1.01 (1.00-1.02)	0.252	1.01 (0.99-1.02)	0.446	1.01 (0.98-1.03)	0.446
FEV ₁ % pred (per percentage)	1.00 (0.98-1.03)	0.794	1 (0.97-1.02)	0.723	1.01 (0.97-1.06)	0.723
High neutrophil proportion level (vs. low neutrophil proportion level)	0.97 (0.47-1.96)	0.937	1.45 (0.65-3.19)	0.359	1.95 (0.47-8.51)	0.359
Inhaled medications (Yes vs No)	0.61 (0.07-3.10)	0.590	0.98 (0.12-5.12)	0.981	2.3 (0.08-22.33)	0.981

The effect values for clinical outcomes are obtained by using the linear regression model. All models are adjusted for age, sex, body mass index, smoking status, smoking index, prior exacerbation, FEV₁% pred, inhaled medication, and levels of sputum neutrophil proportion. BMI=body mass index; FEV₁=Forced Expiratory Volume in one second.