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Background

Clinical studies in asthma usually exclude smokers or ex-smokers with >10 pack-years (PY). Thus, the efficiency of biological therapy (BT) in severe smoking asthmatics is unknown.

Aims and Objectives

We analysed the real-life severe asthma registry cohort treated with biological to evaluate the impact of smoking on clinical outcomes.

Methods

At week 16 and 52 we analysed exacerbation, lung function, asthma control, biomarkers and compared never-smokers (NS) with (ex) smokers (average (ex) smoker (AS), <10 PY, 10-20 PY, >20 PY). Linear models were fitted for each endpoint. Binary or ordinal logistic regression models were computed for non-linear endpoints.

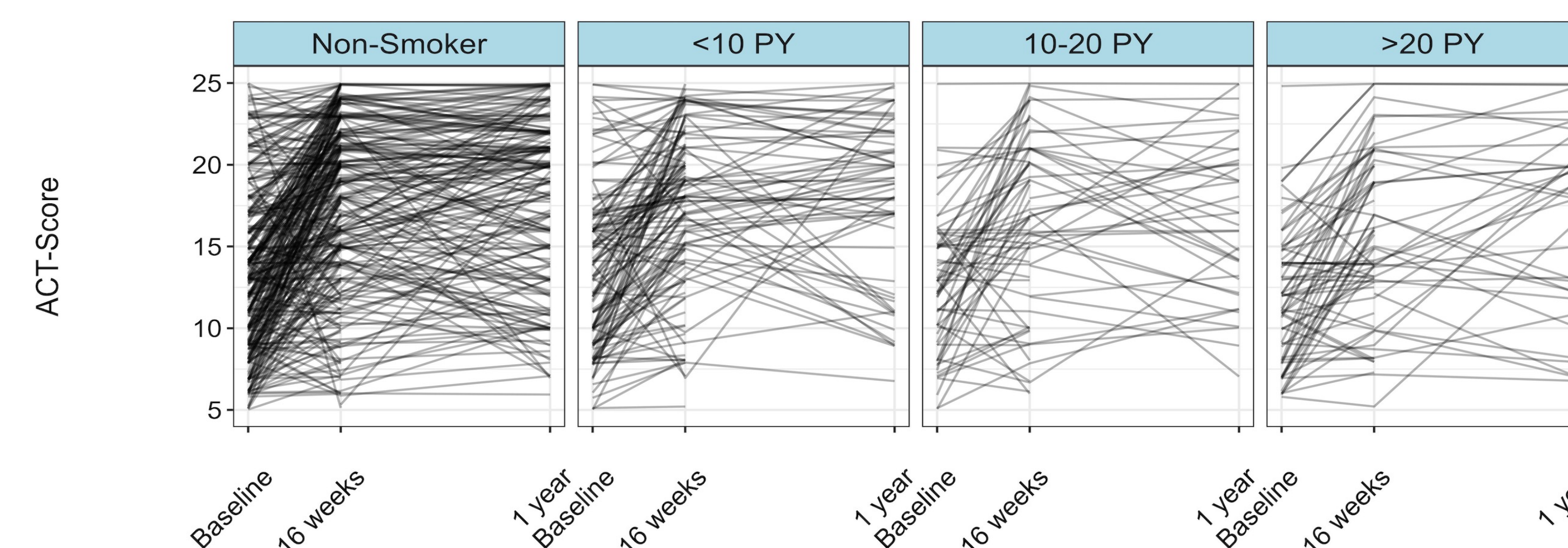
Results- baseline characteristics

Parameter	All	Never-Smokers	Ex-Smokers < 10 PY	Ex-Smokers 10-20 PY	Ex-Smokers >20 PY
No. - %	1129	633 (56)	259 (22.9)	117 (10.36)	120 (10.6)
Age - yr.	53.82 ± 14.67	52.4 ± 16.33	53.2 ± 13.13	57 ± 11.55	59.4 ± 8.08
Female	630 (55.80)	373 (58.93)	143 (52.21)	65 (55.56)	49 (40.83)
BMI (kg/m ²)	27.69 ± 6.18	26.83 ± 6.06	28.38 ± 5.96	28.69 ± 6.03	29.80 ± 6.59
Pack-years	14.56 ± 16.10	-	3.88 ± 2.65	14.12 ± 3.74	38.03 ± 15.69
Allergic conditions	342 (30.29)	212 (33.49)	69 (26.64)	31 (26.50)	30 (25.00)
Nasal Polyps	477 (42.25)	273 (41.13)	108 (41.70)	51 (43.59)	45 (37.50)
No. of exacerbations (last 12 Mo., n= 130)	4.55 ± 5.88	4.52 ± 6.09	5.10 ± 7.42	3.43 ± 2.73	5.60 ± 4.60
ACT-Score (n=941)	13.37 ± 5.17	13.64 ± 5.27	14.06 ± 5.35	12.02 ± 4.39	11.81 ± 4.49
Oral Corticosteroids - no. (%)	525 (46.50)	303 (47.87)	107 (41.31)	58 (49.57)	57 (47.50)

Prebronchodilator FEV1 - L (n =1060)	1.96± 0.80	1.98± 0.79	2.08± 0.85	1.85 ± 0.79	1.68 ± 0.71
- % of predicted value (n=1064)	64.24 ± 22.44	65.67 ± 22.09	65.76 ± 22.15	62.4 ± 24.21	55.26±21.06
FEV1%FVC (n=138)	68.82 ± 15.49	71.24 ± 15.26	67.31 ± 18.10	66.10 ± 12.79	64.06 ± 13.93
FEV1 Reversibility - (%) (n=64)	11.33 ± 12.18	11.60 ± 12.92	10.84 ± 10.23	9.21 ± 12.20	15.46 ± 15.06

Mean blood eosinophil count/ mcl (n= 683)	517.49 ± 958.08	492±812.46	627.58 ± 1442.69	439.08 ± 561.98	474.32 ± 561.98
FeNO - ppb (n= 640)	54.81 ± 50.63	56.60 ± 52.44	51.79 ± 47.64	52.48 ± 54.83	54.15 ± 41.92
Total IgE - IE/ml (n= 144)	245.51± 836.19	246.46 ± 776.41	221.87 ± 713.90	296.73 ± 1423.18	241.61 ± 585.85

Results

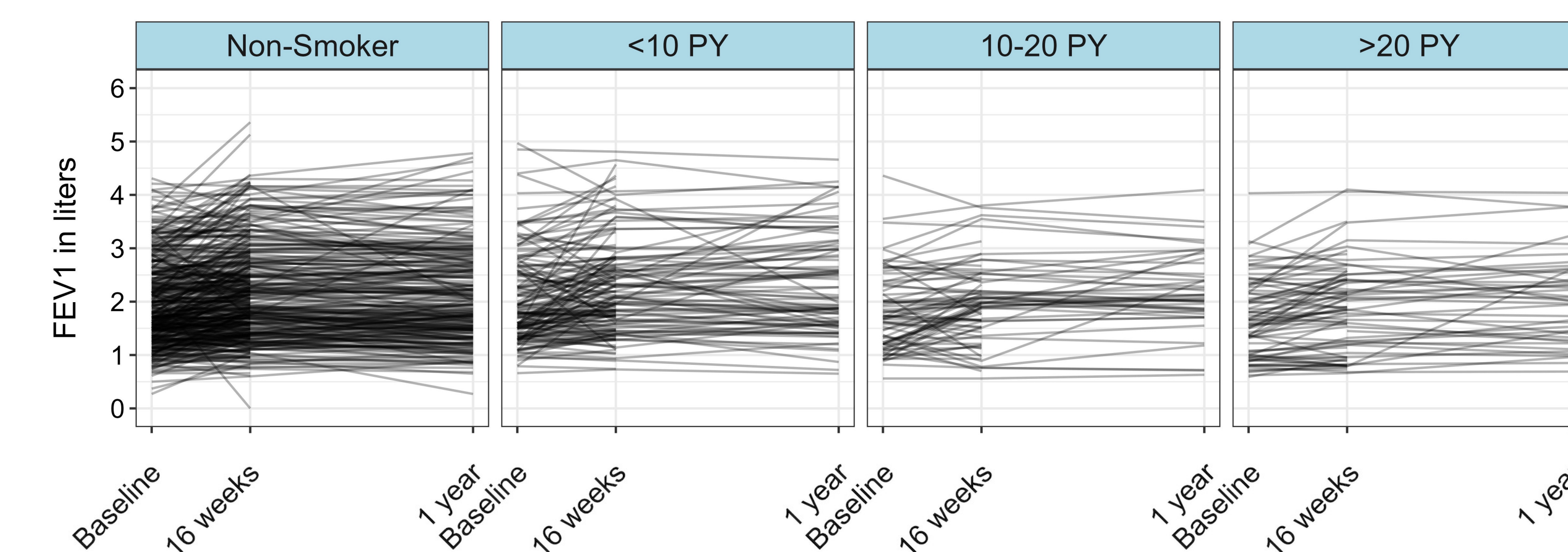
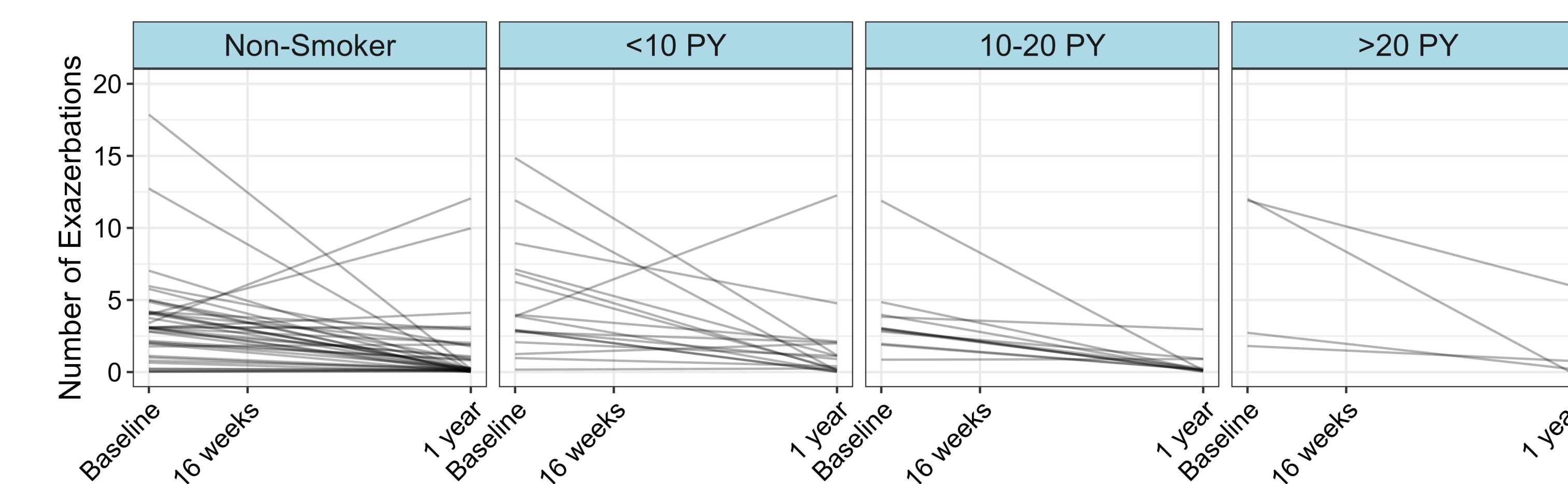


ACT improved more in NS at w16 (p=0.02); improvement was +4,2 p. in NS, +3,33 in smokers, +2,9 if >20 PY (all p<0.001), with no difference at w52 (p=0.48). We also found no difference in improvement of ACQ-5 and miniAQLQ at w52 (p=0.094, p=0.15).

Patients were treated with: Benralizumab (432,38,3%), Dupilumab (326, 28,9%), Mepolizumab (207,18,3%), Omalizumab (158,14%) and Reslizumab (6,0,53%).

Reduction of OCS was similar across groups (p=0.15).

There was no difference in the number of exacerbations in the follow-up period between NS and AS (p =0.8)



Smoking status and number of pack-years did not have influence on change in FEV1 after 4 months and 1 year of BT (estimate 1.03, p=0.2762 at w52).

Rel. diff. NS/AS (w52) was also not significant for FVC (p=0.40), R_{tot} (p=0.06), PEF (p=0.14), MEF25 (p=0.54), MEF50 (p=0.18), MEF75 (0.11), RV and TLC (p=0.77).

Biomarkers

FeNO was estimated to be 69% in NS, 64% in AS (p<0.001) and 69% (p=0.02) if >20 PY (NS/AS p=0.48) of its starting value at w52. Rel. diff. between NS and AS was 1.47 (w16; p=0.272) and 1.63 (p=0.294) at w52 for number of eosinophils and 0.96 (p=0.91) for total IgE (w52).

Conclusion

Following 1 year under BT, average (ex) smokers improved in asthma control, lung function, exacerbations and biomarkers similar as never-smokers.

