The impact of smoking history on baseline characteristic in patients with severe asthma in the German Asthma Net (GAN)

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Background

Active smoking in asthma patients is associated with poor disease control. Little is known about the association between smoking history and other disease characteristics. For patients with severe asthma, precise phenotyping of the individual patient is needed to determine the most appropriate treatment option, including biologic therapy. Since patients with > 10 pack years are excluded from studies with biologicals in severe asthma, data on this population are scarce.

Aims and Objectives

The German Asthma Net (GAN) has established a registry of patients with severe asthma, collecting baseline and long-term follow-up data to characterise the disease, its course and medical care. The aim of this analysis was to evaluate the impact of smoking on the baseline characteristics of patients with severe asthma in this real-life cohort included in the GAN registry.

Methods

We obtained data from the baseline visit of all patients included in GAN if information on smoking history was available. This included questionnaires on disease control and quality of life, data on medications, underlying diseases, exacerbation frequency, lung function parameters and laboratory parameters. Differences in baseline characteristics were assessed using linear models. For each endpoint, the respective baseline score was defined as the dependent variable and age, sex and smoking history summarised in groups (never smoked, <10 pack years, 10-20 pack years and >20 pack years) as explanatory variables.

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Main Finding

Clinical studies in asthma usually exclude (ex-) smokers with >10 pack years. In GAN the prevalence of those patients is 21.9%. Smoking history is associated with altered asthma biomarkers and worse disease control, and may therefore influence the choice of biologic therapy.

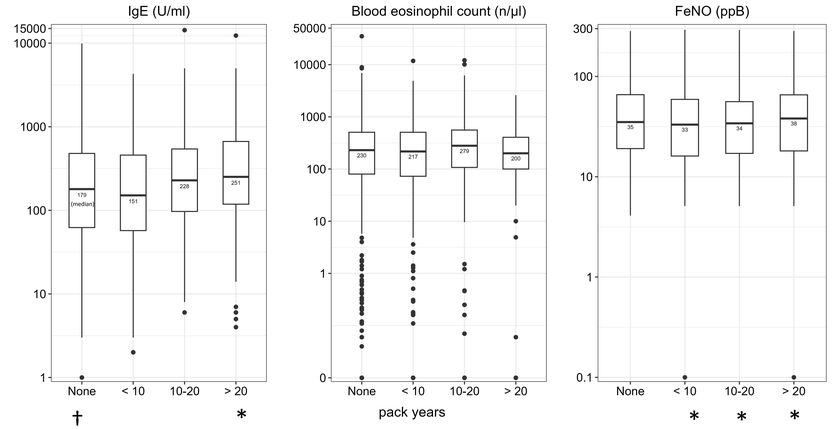
The impact on treatment response of biologics was analysed here: see poster No. PA639

Results

Table 1: Baseline characteristics

	Never-smokers	(Ex-)smokers <10 py	(Ex-)smokers 10-20 py	(Ex-)smokers >20 py
Patients (n)	1.408 (56.8%)	529 (21.3%)	304 (12.3%)	237 (9.6 %)
Age (years)	47.7 ± 19.4†	50.6 ± 13.8	55.2 ± 11.7	58.5 ± 8.9
Sex category (female)	841 (59.7%)†	313 (59.2 %)	153 (50.3%)	93 (39.3 %)
BMI (kg/m²)	27.5 ± 21.8†	27.6 ± 6.6	28.2 ± 9.2	29.3 ± 28.7
CRSwNP	209 (27.5%)	70 (26.0%)	52 (29.2%)	32 (25.8 %)
COPD	19 (2.5%)†	13 (4.8%)*	23 (13.0%)*	36 (29.0%)*
Pulmonary function test				
FEV1 (l)	2.07 ± 0.82	2.09 ± 0.8	2.0 ± 0.8	1.87 ± 0.82*
FEV1 reversibility (n)	158 (20.8%)	44 (16.3%)*	37 (20.8%)	30 (24.2%)
MEF 50 (%)	49.7 ± (34.7) †	45.5 ± 33.4	40.4 ± 30.1	36.3 ± 28.5*
RV (%)	140.03 ± 133.0†	150.0 ± 104.7*	154.8 ± 44.3	157.4 ± 48.8*
DLCO (%)	76.6 ± 18.4†	74.02 ± 19.4*	71.0 ± 19.2*	64.2 ± 21.0*
Symptoms				
ACT-Score	15.3 ± 5.6†	14.6 ± 5.6	14.4 ± 5.6	13.8 ± 5.2*
Acute exacerbations (n/year)	4.1 ± 4.4†	4.3 ± 4.6	4.5 ± 4.5	4.3 ± 3.6
Medication				
Maintenance OCS	436 (33.1%)	179 (33.8%)	119 (39.1%)	92 (38.8%)
Maintenance Prednisolone (mg)	11.7 ± 13.1	10.4 ± 11.0	13.1 ± 17.4	8.9 ± 8.1
ICS/LABA	1142 (81.1%)	425 (80.3%)	243 (79.9%)	195 (82.3%)
ICS/LAMA/LABA	19 (1.4%)†	14 (2.7%)	8 (2.6%)	9 (3.8%)

*All data are presented as n (%) or n ± standard deviation (SD) †=p-value <0.05 for estimated difference between smokers and never-smokers. *=p-value <0.05 for estimated difference between pack-year group and never-smoker (age and sex category as explanatory variables)*
ACT: asthma control test, BEC: blood eosinophil count, COPD: chronic-obstructive pulmonary disease, CRSwNP: cronic rhinosinusitis with nasal polyps, DLCO: diffusion capacity for carbon monoxide, FEV1: forced exsoiratory volume in 1 second, ICS dose = inhaled corticosteroid = equivalent dose beclomethasone, LABA: long-acting beta-agonist, LAMA: long-acting muscarinic antagonist. Mini-AQLQ: mini-asthma quality of life questionnaire, PY :pack years, OCS: oral corticosteroid, RV: residual volume, TLC: total lung capacity



We included 2.472 patients: 65 (2.6%) active smokers, 999 (40.6%) ex-smokers and 1.408 (56.8%) never-smokers. 541 (21.9 %) had 10 or more pack years (py). Smoking was associated with worse asthma control (>20 py: ACT -1.8 points (p <.001); mini-AQLQ -4.7 (p=.004)), while exacerbation rate and oral corticosteroid use and doses were similar. Smoking was associated with worse lung function indicating smoking-related lung injury e.g. DLCO (0.85-fold lower with 10-20 py (p<.001) resp. 0.82 fold lower with >20 py (p<.001)). Smokers had greater signs of hyperinflation (higher RV (p<.001) and TLC (p<.008)). Regarding biomarkers smoking was associated with 1.58-fold higher IgE levels (>20 py: p=.002), 0.84-fold lower FeNO concentrations p=.001) while blood eosinophil count did not differ significantly (p=.19)