

Burden of disease in COPD stratified by eosinophils levels: a UK biobank study

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OBJECTIVES

> Evidence suggests that blood eosinophil levels (EOS) can influence response to therapy in chronic obstructive pulmonary disease (COPD) and predict future exacerbation outcomes¹. This study's objective is to characterize the COPD burden, stratified by EOS levels (EOS≥300 cells/μl vs. EOS<300 cells/μl).



METHODS



Data source: UK Biobank

- Population-based prospective cohort
- 500,000 people
- Enrolled adults 40-70 years, 2006-10

- > **Study design:** Patients diagnosed with COPD (ICD-9: 492, 496X; ICD-10: J43, J44) with an available EOS count at baseline, who did not have comorbid asthma, lung cancer, cystic fibrosis, or any other lung diseases, were included and followed from recruitment until December 31st, 2019.
- > **Analysis:** The primary endpoint was the occurrence of severe exacerbations, defined as COPD-related hospitalization. We evaluated the univariate relationships with patient baseline characteristics using logistic regression. Multivariate models were performed with stepwise variable selection.



RESULTS

Blood EOS Distribution in the COPD Population

EOS<300 (79.9%)

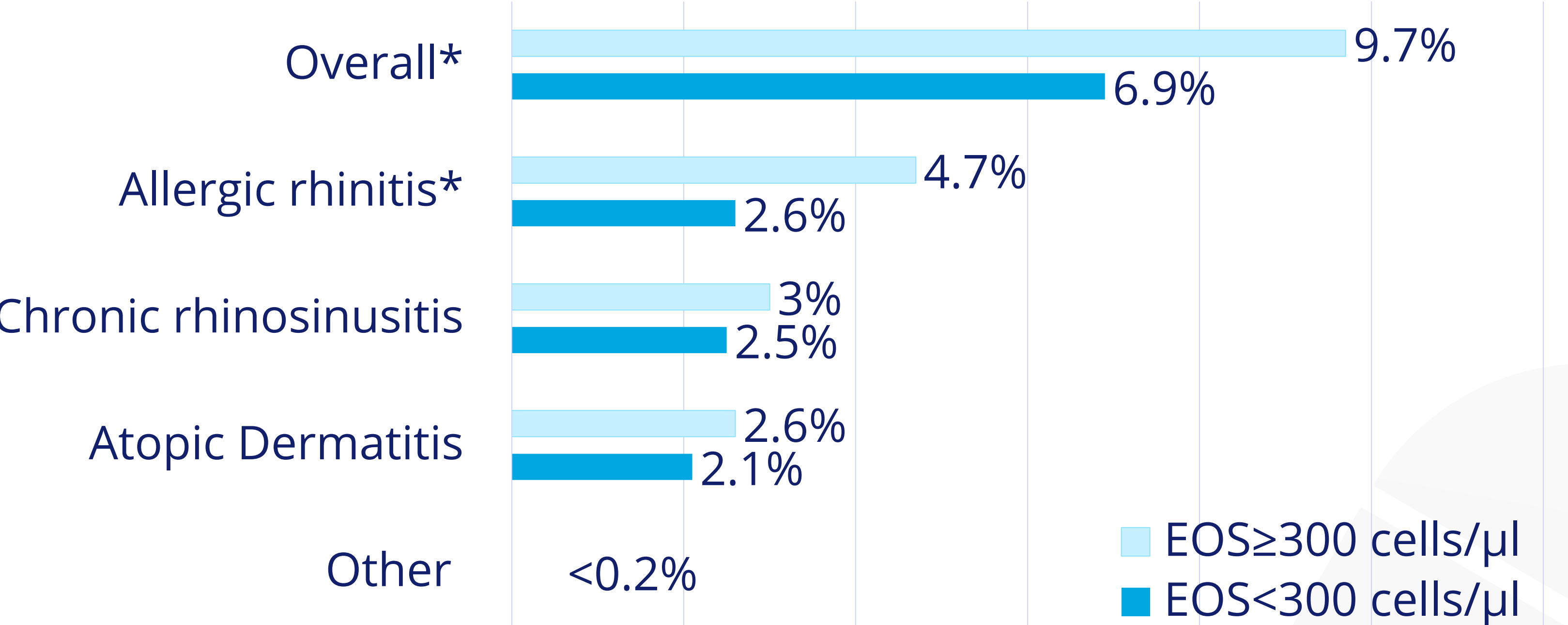
EOS≥300 (20.1%)

Study Population Baseline Characteristics

	COPD Population	EOS < 300 cells/μl	EOS ≥ 300 cells/μl
N (%)	5,097	4,075 (79.9)	1,022 (20.1%)
Mean age (SD), years	61.4 (6.7)	61.3 (6.7)	61.8 (6.6)*
Male, n (%)	2,820 (55.3%)	2,156 (52.9%)	664 (65.0%)*
Smoking status (former or current)	3,962(77.7%)*	3,141(77.1%)*	821 (80.3%)*
BMI	27.9 (5.4)	27.8 (5.4)	28.2 (5.4)*
Age of death	70.8 (6.3)	70.7 (6.4)	71.2 (5.8)
Type-2 inflammation comorbidities, n (%)#	380 (7.5%)	281 (6.9%)	99 (9.7%)*

#Atopic dermatitis, CRSwNP, CRSsNP, Allergic rhinitis, Chronic inducible urticaria, Chronic spontaneous urticaria, Chronic pruritus of unknown origin, Bullous pemphigoid, Eosinophilic esophagitis & Prurigo nodularis

Proportion of COPD patients with a type-2 inflammation-related comorbidity at baseline EOS≥300 cells/μl versus EOS <300 cells/μl



*Observed differences are significant, p<0.05

Univariate and multivariate logistic regression analysis

Variable	COPD Population			
	Univariate Analysis		Multivariate Analysis*	
	OR (95%CI)	p-value	OR (95%CI)	p-value
One or more exacerbation	1.27 (1.10-1.46)	0.001	1.20 (1.03-1.39)	0.021

*adjusted for age, gender, smoking status, type-2 inflammation comorbidities, Nitrogen Dioxide air pollution and BMI

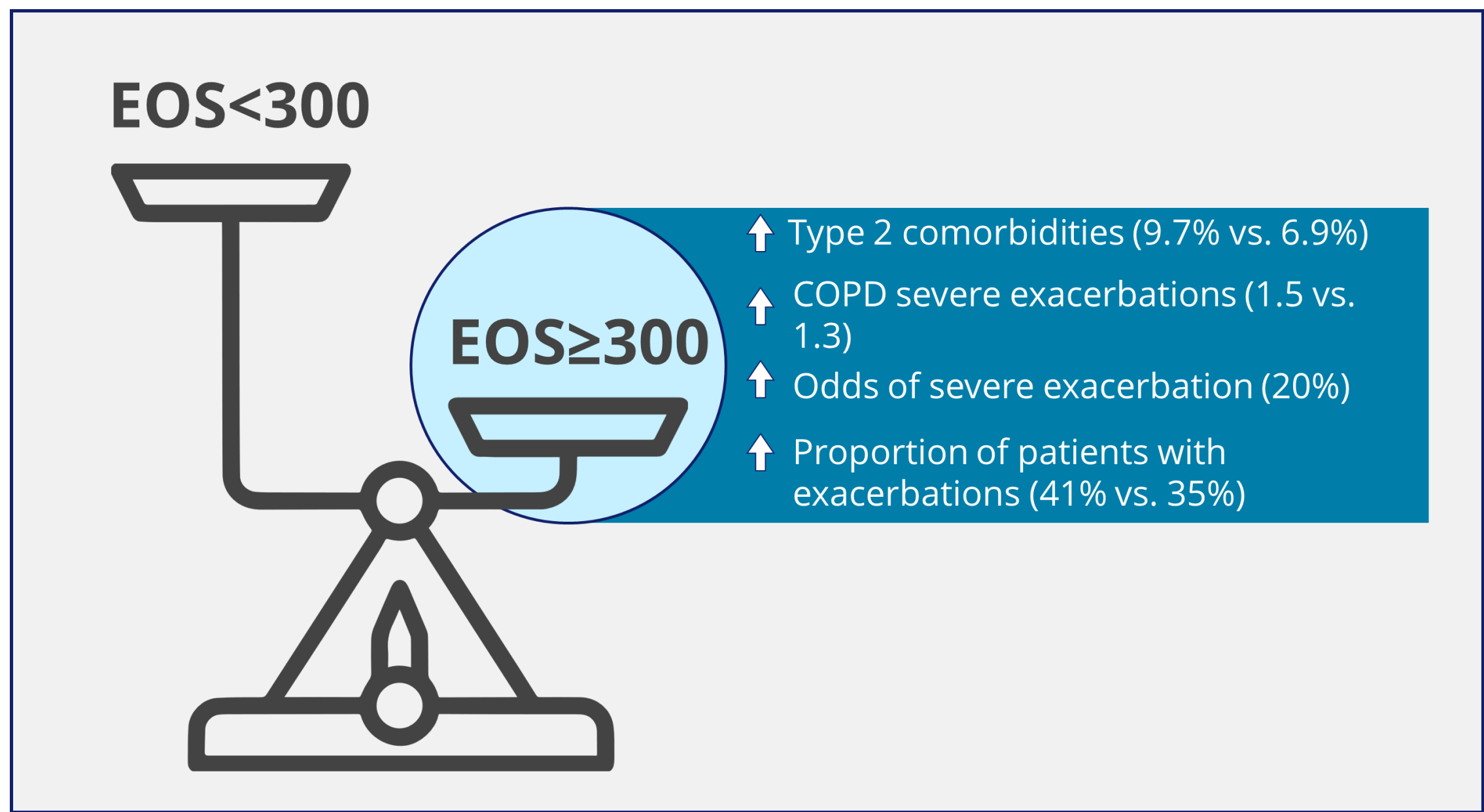
Follow-up period: occurrence of COPD-severe exacerbations

	COPD Population	
	EOS <300 cells/μl N= 4,075	EOS ≥300 cells/μl N=1,022
Follow-up duration (years), median [Q1,Q3]	10.6 [9.7,11.4]	10.8 [9.8,11.6]
Patients with at least 1 exacerbation, n (%)	1,442 (35.4%)	419 (41.0%)*
Mean number of exacerbations during follow-up (SD)	1.3 (2.7)	1.5 (2.8)*

*Observed differences are significant, p<0.05



RESULTS SUMMARY



CONCLUSION

> This study demonstrates that raised blood eosinophils are associated with increased disease burden, as measured by COPD severe exacerbations, and the prevalence of type-2 inflammatory comorbidities.



REFERENCES

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