OVERLAP OF BIOMARKERS AND TYPE-2 COMORBIDITIES IN AN INTERNATIONAL SEVERE ASTHMA POPULATION

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Background:

The lack of a harmonized international cohort of severe asthma patients has restricted attempts to describe and compare asthma and non-asthma characteristics by common biomarkers in a large severe asthma population. The overlap and discordance of biomarkers, such as blood eosinophil count (BEC), immunoglobulin E (IgE) and fractional exhaled nitric oxide (FeNO), have not been explored in an international cohort of patients with varying features of severe asthma.

Using a sample of the International Severe Asthma Registry (ISAR; http://isaregistries.org/), this abstract highlights key asthma and non-asthma characteristics of biomarker groups.

Aim:

To describe common biomarkers including BEC, IgE and FeNO distributions and pattern of Type-2 (T2) comorbidities (allergic rhinitis, chronic rhinosinusitis and nasal polyps) in an international severe asthma population.

Method:

776 adults with severe asthma on GINA Step 5 or uncontrolled on GINA Step 4, enrolled in ISAR between September 2018 to January 2019 from Italy (n=564), USA (n=55), Spain (n=46), Bulgaria (n=32), Greece (n=28), Canada (n=25), Kuwait (n=16) and South Korea (n=10) were used to facilitate a cross-sectional review of key baseline clinical attributes: age, gender, age of asthma onset (Late-onset: ≥18 years), BEC (Low: <300, High: ≥300 cells/µl), FeNO (Low: <25, High: ≥25 ppb), IgE (Low: <100, High: ≥100 IU/ml) and T2 comorbidities.

Results:

A total of 129 patients with BEC, FeNO and IgE counts were analysed. The majority of the severe asthma patients were found in the high BEC, high FeNO and high IgE cluster (31%). 69% (n=89) of patients had at least 2 out of these 3 high biomarkers (Figure 1). Additionally, characteristics of 187 patients with BEC and FeNO and 226 patients with BEC and IgE levels were analysed separately. Mean age was the highest for patients in the high BEC/low FeNO cluster and lowest in the low BEC/high IgE cluster. Allergic rhinitis and nasal polyps were most prevalent in the high BEC/high FeNO and high BEC/high IgE clusters. Chronic rhinosinusitis was most prevalent in low BEC/high FeNO and low BEC/low IgE clusters (Table 1).

Conclusion:

The outlined combinations of key patient characteristics and biomarker clusters in a sample of the ISAR database can serve as basis for identification of specific phenotypes of severe asthma.

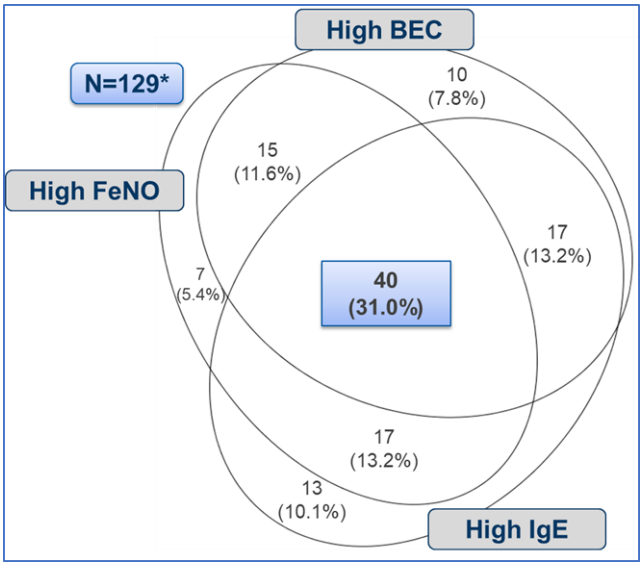

Figure 1: Overlap of biomarkers in a global severe asthma population
*N=10 (7.8%) in low BEC, low FeNO and low IgE cluster.

Table 1: Characteristics of global severe asthma population stratified by biomarkers

		N	Age, Mean (SD)	Female		Late-onset ≥18 years		Comorbidities					
				Non-missing, N	N (%)	Non-missing, N	N (%)	Allergic rhinitis		Chronic rhinosinusitis		Nasal polyps	
								Non-missing, N	N (%)	Non-missing, N	N (%)	Non-missing, N	N (%)
BEC	**FeNO***												
Low	Low	34	54.3 (11.5)	28	18 (64.3)	32	27 (84.4)	27	19 (70.4)	30	20 (66.7)	33	12 (36.4)
	High	38	52.0 (12.6)	26	13 (50.0)	32	24 (75.0)	28	20 (71.4)	28	**20 (71.4)**	30	12 (40.0)
High	Low	38	55.9 (15.1)	38	25 (65.8)	35	29 (82.9)	20	16 (80.0)	32	8 (25.0)	38	18 (47.4)
	High	80	51.4 (12.0)	70	39 (55.7)	76	65 (85.5)	54	**50 (92.6)**	67	35 (52.2)	76	**46 (60.5)**
BEC	**IgE**												
Low	Low	26	54.4 (12.5)	19	12 (63.2)	25	21 (84.0)	21	15 (71.4)	23	**15 (65.2)**	25	9 (36.0)
	High	54	50.2 (12.6)	47	28 (59.6)	48	31 (64.6)	39	30 (76.9)	47	22 (47.8)	47	15 (31.9)
High	Low	40	53.7 (11.9)	38	21 (55.3)	39	31 (79.5)	18	16 (88.9)	37	17 (45.9)	40	20 (50.0)
	High	106	53.0 (13.9)	104	60 (57.8)	99	82 (82.8)	72	**66 (91.7)**	93	50 (53.8)	101	**52 (51.5)**

Notes: *FeNO not performed in Bulgaria, Kuwait and South Korea.
Patient can have more than one comorbidity therefore the percentages will not add up to 100.

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