

Supplementary material:

**Supplementary Table 1.** The items from the PRAXIS questionnaire used in the study. ICS – inhaled corticosteroids; LABA- long acting beta-2 agonists; LTRA - leukotriene antagonist. ACT-asthma Control Test; mini-AQLQ – mini Asthma Quality of Life Questionnaire.

	ITEMS	ANSWERS
<b>Variables into the cluster model</b>		
1	How old are you?	....years
2	Sex	Male....Female....
3	Length and weight	...cm ...kg
4	Do you smoke?	Never/Ex/Current (daily or occasional)
5	Age of asthma onset	<=15 years/16-45 years/>=46 years
6	Do you have allergy against pets or pollen?	Yes often/Sometimes only or No
7	Have you had rhinitis in the last 12 months?	Yes/No
8	Do you have gastroesophageal reflux in the night (at least once a week)?	Yes/No
9	Have you had diabetes in the last 12 months?	Yes/No
10	Have you had cardiovascular disease (heart disease, stroke and hypertension) in the last 12 months?	Yes/No
11	Have you had sleep apnea in the last 12 months?	Yes/No
12	Have you had depression and/or anxiety in the last 12 months?	Yes/No
13	Have you had sinusitis in the last 6 months?	Yes/No
14	Have you woken up in the night due to asthma symptoms such as cough, wheeze and/or dyspnea (during the last week)?	No/Once/ Several times
<b>Not included into the cluster model</b>		
1	How often do you exercise (until you get out of breath or/and sweat)?	Daily/few times a week/Once a week/Once a month/Less
2	What is your highest education level?	Compulsory school (up to 15 years old) Secondary school (up to 18 years old) High education (at least 3 years old beyond secondary level)
<b>Outcome variables</b>		
1	ACT	Reference <sup>27</sup>
2	Mini-AQLQ	Reference <sup>26</sup>
3a	Have you visited emergency due to asthma related symptoms during the last 12 months?	Never/Once/ Twice/Three or more times
3b	Have you used oral corticosteroids (prednisolone or betamethasone) because of asthma symptoms during the last 6 months?	Yes/No
4	Patients reported asthma severity	No current asthma/Very mild/mild/moderate/severe
5	Treatment steps	(a) No ICS (b) Only ICS (c) ICS+LABA and/or LTRA

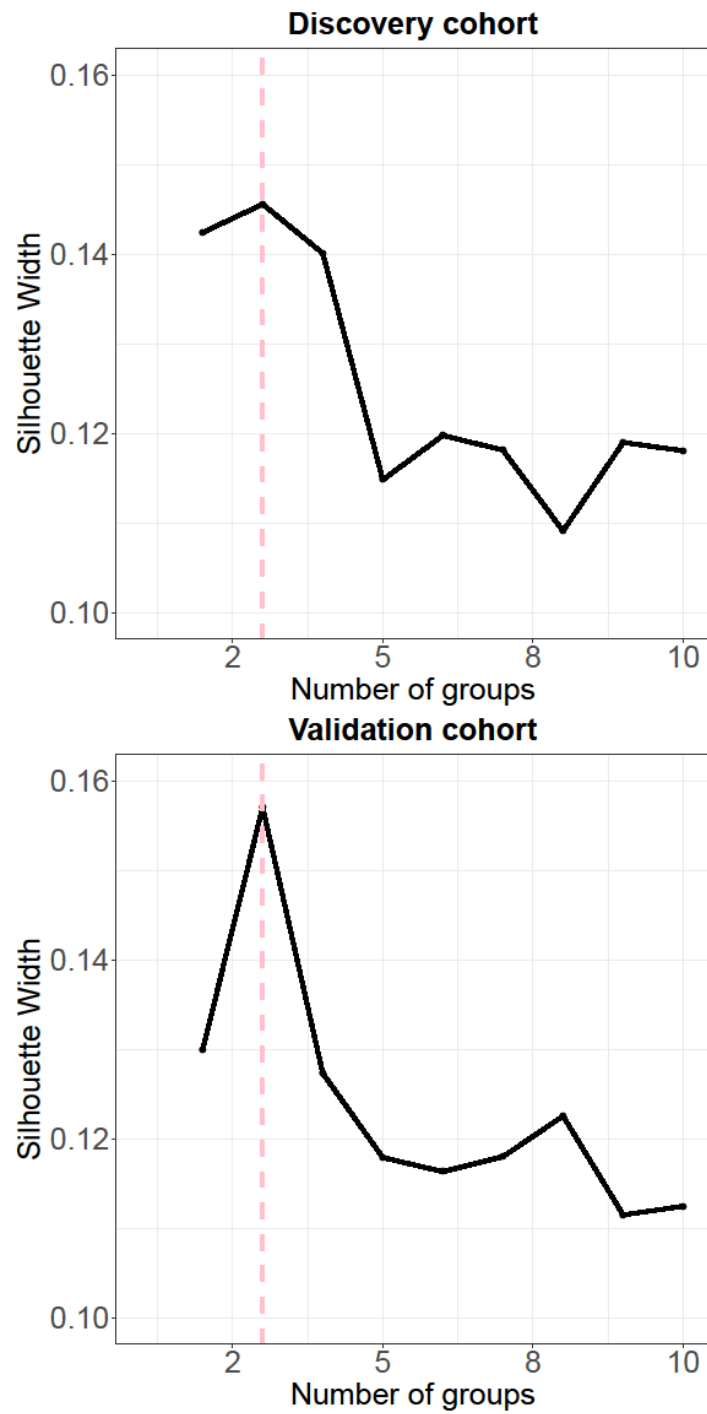
**Supplementary Table 2.** The mean score ( $\pm$ SD) of ACT and mini-AQLQ in three phenotypes in both cohorts.

<b>Cohort</b>		<b>Early onset predominantly female</b>	<b>Adult onset predominantly female</b>	<b>Adult onset predominantly male</b>
<b>Discovery</b>	<b>ACT</b>	18.7 (4.6)	19.4 (4.7)	21.0 (4.3)
	<b>Mini-AQLQ</b>	5.1 (1.3)	5.4 (1.2)	5.8 (1.1)
<b>Validation</b>	<b>ACT</b>	18.8 (5.1)	19.9 (4.6)	20.9 (4.5)
	<b>Mini-AQLQ</b>	5.1 (1.4)	5.4 (1.1)	5.8 (1.2)

**Supplementary Table 3.** The Spearman rank correlation between the self-reported severity and the ACT-score/exacerbation history

<b>Cohort</b>		<b>Correlation coefficients</b>	<b>P-values</b>
<b>Discovery</b>	<b>Self--ACT</b>	-0. 61	p<0.001
	<b>Self--exacerbation</b>	0.35	p<0.001
<b>Validation</b>	<b>Self-ACT</b>	-0.67	p<0.001
	<b>Self--exacerbation</b>	0.41	p<0.001

**Supplementary Figure 1.** The silhouette distance analysis suggests the optimal number of clusters (phenotypes) as three.



**Supplementary Figure 2.** Visualization the clustering results with t-distributed stochastic neighborhood embedding, or t-SNE method.

