T2-high asthma phenotypes across lifespan

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Shareable abstract (@ERSpublications)
T2-high asthma defined by blood eosinophilia and atopy occurs across all ages and is associated with high levels of allergen-specific IgE, increased propensity for IL-5 production of leukocytes and persistence of asthma into adulthood https://bit.ly/35X11EF

Cite this article as: Maison N, Omony J, Illi S, *et al*. T2-high asthma phenotypes across lifespan. *Eur Respir J* 2022; 60: 2102288 [DOI: 10.1183/13993003.02288-2021].

Abstract

Rationale In adults, personalised asthma treatment targets patients with type 2 (T2)-high and eosinophilic asthma phenotypes. It is unclear whether such classification is achievable in children.

Objectives To define T2-high asthma with easily accessible biomarkers and compare resulting phenotypes across all ages.

Methods In the multicentre clinical All Age Asthma Cohort (ALLIANCE), 1125 participants (n=776 asthmatics, n=349 controls) were recruited and followed for 2 years (1 year in adults). Extensive clinical characterisation (questionnaires, blood differential count, allergy testing, lung function and sputum induction (in adults)) was performed at baseline and follow-ups. Interleukin (IL)-4, IL-5 and IL-13 were measured after stimulation of whole blood with lipopolysaccharide (LPS) or anti-CD3/CD28.

Measurements and main results Based on blood eosinophil counts and allergen-specific serum IgE antibodies, patients were categorised into four mutually exclusive phenotypes: "atopy-only", "eosinophils-only", "T2-high" (eosinophilia + atopy) and "T2-low" (neither eosinophilia nor atopy). The T2-high phenotype was found across all ages, even in very young children in whom it persisted to a large degree even after 2 years of follow-up. T2-high asthma in adults was associated with childhood onset, suggesting early origins of this asthma phenotype. In both children and adults, the T2-high phenotype was characterised by excessive production of specific IgE to allergens ($p<0.0001$) and, from school age onwards, by increased production of IL-5 after anti-CD3/CD28 stimulation of whole blood.

This article has an editorial commentary: https://doi.org/10.1183/13993003.01031-2022

Received: 19 Aug 2021
Accepted: 4 Feb 2022

Conclusions Using easily accessible biomarkers, patients with T2-high asthma can be identified across all ages delineating a distinct phenotype. These patients may benefit from therapy with biologicals even at a younger age.