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REVIEW ARTICLE

Prognosis of new-onset asthma diagnosed at adult age

Leena E. Tuomisto [a,*], Pinja Ilmarinen [a], Hannu Kankaanranta [a,b]

[a] Department of Respiratory Medicine, Seinäjoki Central Hospital, Seinäjoki, Finland
[b] Department of Respiratory Medicine, University of Tampere, Tampere, Finland

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summary
Background: Asthma is a common chronic disease, which can affect patients at any age. Recently, cluster analyses have suggested that patients with asthma can be divided into different phenotypes and that the age at the onset of the disease is a critical defining factor. The prognosis of allergic childhood-onset asthma is relatively well known, whereas the prognosis of adult-onset asthma remains unclear.
Methods: We undertook a systematic review to identify studies that evaluated the long-term prognosis of new-onset asthma diagnosed at adult age. Criteria used (set 1) were: 1. adult-onset asthma, 2. physician diagnosed asthma (including objective lung-functions) $<$ 1 year before the first visit, 3. follow-up time of at least 5 years, 4. objective lung function measurements used at follow-up and 5. not a comparative trial. Another set of studies (set 2) with less strict criteria were gathered.
Results: The main result of this systematic review is that the amount of evidence on the prognosis of new-onset asthma diagnosed at adult age is very limited. Only one study (n = 250) fulfilled the criteria (set 1) and it suggests that the five-year prognosis of new-onset asthma diagnosed at adult age may not be favorable, the proportion of patients being in remission was less than 5%. Furthermore, six additional follow-up studies (n = 964) were identified including mainly patients with adult-onset asthma (set 2). These studies had variable endpoints and the results could not be combined.
Conclusion: Further follow-up studies that recruit patients with new-onset adult asthma are needed to understand the prognostic factors in adult-onset asthma.

* Corresponding author. Seinäjoki Central Hospital, Department of Respiratory Medicine, 60220 Seinäjoki, Finland.
E-mail address: leena.tuomisto@epshp.fi (L.E. Tuomisto).

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Introduction

Asthma is a common chronic disease that can affect patients at any age with varying severities. Until the last decade, asthma has been considered mainly as a single allergic, eosinophilic, T_H2-mediated and glucocorticoid-responsive disease [1,2]. However, more recently, it has become apparent that a vast amount of heterogeneity exists among asthma patients. Cluster analyses have suggested that patients with asthma can be divided into different phenotypes [3—5]. In all of these studies, the age at disease onset was found as a key differentiating factor between phenotypes. Atopy and allergy are generally associated with early- or childhood-onset disease with varying severities. In contrast, later- or adult-onset disease is generally less associated with allergy and phenotypes such as late-onset eosinophilic (often severe), exercise-induced, obesity-related, neutrophilic and smooth-muscle-mediated (paucigranulocytic) asthma have been proposed [6,7]. In addition, comorbidities and confounders such as smoking, hormonal influences, infection and occupational exposures can influence the underlying immunoinflammatory processes [6,8—10]. While many of these are not short-term and momentary incidents but rather cumulative exposures after many years, one may hypothesize that their contribution is larger in late-onset asthma and could thus also contribute to the outcome of the disease.

Take home message

The long-term prognosis of new-onset asthma diagnosed at adult age and based on lung-function measurements remains unknown.

There is no uniform definition for the age that separates adult- or late-onset asthma from child- or early-onset asthma; it varies between 12 and 20 years and in some studies late-onset asthma refers to asthma diagnosed at age of 65 or above [9]. A cut-point of 18—19 years has often been used in epidemiological studies evaluating the incidence of adult-onset asthma [11].

As asthma has been considered mainly as a single allergic disease, a vast majority of asthma studies have focused on allergic asthma usually starting in childhood [6,9,12]. The prognosis of allergic childhood-onset asthma is relatively well known [13—16], and may be better than the prognosis of adult-onset asthma. The symptoms in the first 3 years of life and at school age are often transient and approximately 3 of 4 asthmatic patients will outgrow their asthma by mid-adulthood [15]. Remission was 3.7 times as likely with childhood-onset (onset $<$ 10 years) asthma and $>$1.3 times as likely with adolescent-onset (onset 10—20 years) asthma compared with adult-onset asthma (onset $>$ 20 years) [16]. Severity of symptoms and sensitization seems to be inversely associated with remission i.e. increase risk of persistence [15]. Patients with severe asthma beginning at adult age had a three-fold greater risk of persistent airflow limitation when compared to patients with severe asthma beginning before 18th birthday [17]. Also subjects with late-onset asthma (onset $>$ 12 years) have lower lung function despite shorter duration of the disease than those with early-onset severe disease [18].

Variability of the disease phenotypes complicates generalizability of the disease outcomes from childhood asthma studies to the adult-onset phenotypes. For example, the response of allergic childhood asthma to inhaled glucocorticoids is generally very good [19], whereas in adults different add-on therapies are often needed [20,21] and the therapeutic response still remains insufficient, especially in some phenotypes [22,23].

The characterization of phenotypes or endotypes of asthma is still far from finished [24,25] However, a critical factor defining phenotypes has been characterized, i.e. the