

R E V I E W

Asthma in children and adolescents: the Control'Asma project

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Abstract. The control of asthma is the objective of asthma management. However, it is difficult to obtain in clinical practice. The Italian Society of Allergy and Clinical Immunology promoted the nationwide project "Control'Asma" to investigate the real situation in a group of children and adolescents with asthma. The preliminary outcomes demonstrated that many asthmatic subjects do not achieve adequate asthma control. Moreover, asthma in Italian children and adolescents was usually more frequent in males, had an early onset and allergic phenotype with very frequent rhinitis comorbidity, uncontrolled and partly controlled asthma affected about the half of subjects. However, this project suggested that the assessment of asthma symptom perception by VAS could be a reliable tool in the asthma management. (www.actabiomedica.it)

Key words: asthma, asthma control, children, adolescents, VAS, respiratory symptoms, lung function

Asthma represents a common disease in childhood and adolescence because of the high prevalence (about 5-10%), chronic nature, the potentially severe symptoms, and the relevant burden on healthcare resources (1). The definition of asthma, provided by the Global Initiative for Asthma (GINA) guidelines, describes it as a heterogeneous disease (2). Therefore, asthma management is a daily challenge in pediatric practice. Variability of symptoms and airflow limitation is an asthma characteristic that may vary over time and in intensity.

Asthma is, per definition, a heterogeneous disease, usually characterized by chronic airway inflammation (1). To define clinical, functional, and immunopathological patterns allows identifying asthma phenotypes and endotypes (3, 4). In this regard, the allergic asthma phenotype is the most common in childhood and is defined when asthma symptoms and airway inflamma-

tion are associated with inhalation of the sensitizing allergen (5).

Asthma management should include the assessment of asthma control, as suggested by many guidelines (1,6-8). GINA identifies three levels of asthma control: well-controlled, partly controlled, and uncontrolled (1). The level of asthma control is recognized by the frequency and intensity of symptoms and functional limitations; it is associated with the underlying severity, responsiveness to treatment, and adequacy of asthma care and management (9). From a clinical point of view, the treatment is tailored to severity and adjusted based on the level of control. Many factors may affect asthma control, including socioeconomic and environmental factors, poor adherence to treatment, suboptimal treatment, or unresponsiveness to treatment (10-12). Uncontrolled asthma is the leading risk factor for exacerbations and leads to impaired quality

of life and increased health care use (13-17). Therefore, the assessment of asthma control and medication use is fundamental in evaluating the effectiveness of the current treatment. Indeed, the current asthma guidelines recommend a control-based approach to management. However, achieving control can be elusive in asthmatic children. Therefore, new strategies are searched for implementing pragmatic asthma management. For this purpose, the Italian Society of Paediatric Allergy and Immunology recently established a perspectival project ("ControL'Asma") to investigate the asthma control in children and adolescents managed in clinical practice. Therefore, a nationwide study was designed to pursue this objective, involving ten third level pediatric allergy clinics across Italy. The outcomes could reveal the real-world situation of asthma control in Italy. Notably, increasing attention is presently paid to the real-world studies as they may provide information more adherent to the daily practice than randomized controlled trials that involve selected patient populations that rarely mirror the real situation (18).

The first findings of this real-life project provided clinically relevant data that may, therefore, faithfully mimic the daily medical activity on asthmatic pediatric outpatients. A primary outcome showed that there was a relative prevalence of asthmatic males, such as about 70%; this finding is surprisingly conflicting with data obtained on asthmatic adults in whom the female prevalence is higher (19,20). This discrepancy mainly depends on different hormonal patterns over the lifetime. There was a slight prevalence of children even though the median age was 11.2 years, but the median asthma duration was five years: it means that the asthma onset was rather early, such as at about six years. Asthma seems to onset very early and affects mainly males. Another important outcome was the perception of asthma symptoms assessed by VAS. This issue has been scarcely investigated in childhood. Two studies showed that asthma symptom VAS could reasonably predict bronchial obstruction and bronchial reversibility (21,22). VAS assessment could be very fruitful to achieve a quick idea of actual airflow in clinical practice.

Interestingly, the current study also included the perception of asthma symptoms by the parents and doctors to obtain a complete assessment of the subjective asthma experience. The median and categorized

VAS results were high in patients, parents, and doctors. Rhinitis was very frequent comorbidity, as almost 90% of asthmatics also had upper airway involvement. This finding underlines the close association between asthma and rhinitis and the concept that the evaluation of the upper airways deserves adequate attention in all asthmatics (23). Consistently, allergy was present in 95% of patients. In other words, the allergic phenotype is predominant in childhood and adolescence and confirms the clinical relevance of type 2 inflammation in asthma pathogenesis (24,25). In this regard, the use of more aggressive therapy, such as systemic corticosteroids, is relatively frequent, affecting about one-quarter of patients.

On the contrary, high dose ICS is very rare as concerning only 3%. Biologic use is still minimal, as only 1% was treated with omalizumab (26-28). These findings are substantially conflicting with the asthma control level preliminarily observed. Well-controlled asthma was achieved in 55% of patients, but 32.4% had partly controlled and 12.6% uncontrolled. These outcomes are consistent with literature data that show as it is challenging to obtain control of asthma (29-31). Many factors may be involved in partly-uncontrolled asthma, including severe pheno-endotypes, comorbidity, poor adherence, emotional disorders. In this regard, asthma control perception may be an intriguing issue. The asthma control questionnaire revealed that about 30% of patients perceived uncontrolled asthma. This outcome conflicts with the GINA asthma control level that is very lower (12.6%). It may depend on different factors, as recently reported (32).

Comparing the three subgroups analyzed by the asthma control level, the uncontrolled patients had, as expected, the lowest spirometry parameters (including bronchial obstruction and reversibility) and cACT/ACT scores as well as VAS values (including parents and doctors), and more use of corticosteroids (both oral and inhaled). These significant differences also remained in the *post hoc* analysis. However, allergy and rhinitis comorbidity did not affect the differences among subgroups. It could mean that type 2 inflammation is a pivotal sign of asthma in childhood and adolescence. Thus, tailored treatment should target airway eosinophilic infiltrate using anti-inflammatory drugs, namely CS, or biologics in severe asthma. How-

ever, high dose ICS are barely used, whereas systemic CS is more frequently used. Probably, it might depend on low adherence issues or inadequate follow-up, also considering the time interval.

The assessment of asthma symptom perception may be a valuable parameter that can give an immediate idea concerning the asthma trend, including clinical and functional aspects.

In conclusion, these preliminary findings of the ControLAsma project showed that asthma in Italian children and adolescents was usually more frequent in males, had an early onset and allergic phenotype with very frequent rhinitis comorbidity, uncontrolled and partly controlled asthma affected about the half of subjects. The assessment of asthma symptom perception by VAS could be a reliable tool in the asthma management.

Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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