Advances in Asthma – III

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Asthma is one of the major medical conditions worldwide, affecting over 300 million people globally. Asthma is a highly heterogeneous disease and hence proper clinical phenotyping is essentially a part in developing personalized treatment plan. Asthma is associated with many comorbid conditions which can make the treatment challenging.

In recent years there has been a global tendency towards increasing prevalence of both asthma and obesity in children. It is documented that obesity increases asthma's risk or severity [1]. The asthma phenotype associated with obesity is distinct, and increased degree of adiposity is associated with increasing airway inflammation and hyperreactivity in obese patients. Comorbid conditions such as gastroesophageal reflux disease (GERD) and sleep disordered breathing (SDB) can amplify the degree of airway inflammation leading to suboptimal asthma control. In this issue of Indian Journal of Pediatrics, the third part of the special asthma symposium, Gupta et al., discuss the complex interaction between asthma, obesity and GERD. The authors review the role of various pathophysiological interactions linking these 3 entities as a triangle of inflammation. It is believed that GERD and SDB may lead to inflammation in airways and contribute to asthma-obesity association. A better understanding of mechanisms by which obesity and GERD lead to inflammation in airways and increase the risk of asthma may provide insight towards targeted treatment approach of these patients. The authors discuss the role of effective treatment of reflux and SDB in optimal control of asthma [2].

Though one's genetics plays an important role in development of asthma, it is important to recognize that several epigenetic and environmental factors help in asthma progression and persistence. Asthma can be exacerbated by multiple risk factors, many of which are modifiable and preventable. A major example of this is environmental pollution. There is increasing evidence of the negative link between environmental pollution and respiratory diseases such as asthma and allergies, especially in developing countries. In the next article, Krishnan and Panacherry [3] discuss the interaction between environmental pollutants and asthma. They review the various harmful air pollutants affecting pulmonary health and different methods used to assess air pollution and air quality. They also review the pathophysiological mechanism regarding air pollutants resulting in airway inflammation and asthma. Finally, it is practically impossible to control asthma on an individual level and unable to reduce the asthma prevalence at the population level without effectively controlling the environmental pollution.

There are two endotypes of asthma described *i.e.*, allergic asthma and intrinsic asthma, both differing in pathophysiology and treatment. Allergic asthma is predominant in children. Severe asthma with fungal sensitization (SAFS) has been recently described as a new phenotype of asthma, representing a shift from allergic asthma to SAFS and finally developing to allergic bronchopulmonary aspergillosis (ABPA). More literature is being published regarding the prevalence of fungal sensitization in children with severe asthma. The next article by Singh and colleagues [4] review the recent literature on role of various fungal sensitizations in severe asthma. They discuss the different types of hypersensitivity reactions involved in its pathogenesis and discuss ABPA in detail including its prevalence in severe asthma, various classifications, diagnostic criteria and laboratory tests used to diagnose ABPA. Understanding the role of fungal sensitization and ABPA is critical in management of severe and difficult to control asthma. Finally, the authors discuss various treatment options for fungal sensitization and ABPA in children with severe asthma.

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Asthma in children is a chronic condition which is amenable for control but not cure. Though pharmacological modalities effectively control airway inflammation, but there is a risk of recurrence and potential for adverse events with these medications. Various complementary and alternative medicines/techniques are available, of which breathing exercises, and yoga and/or pranayama are gaining popularity and have been tested in several clinical trials. Asthma is just not the disease of what we breathe but how we breathe. Children with asthma tend to hyperventilate and breathe by mouth rather than nasally. Hyperventilation leads to relative hypocarbia which may increase sympathetic tone that can directly lead to airway inflammation. In this last article, Shankar and Das [5] discuss physiological role of dysfunctional breathing on airway inflammation. They review various breathing retraining techniques and its impact of asthma control. The authors did a literature review regarding breathing exercises, Buteyko breathing, yoga and pranayama on asthma control. These are typically been used in children with chronic asthma rather than in management of acute exacerbation of asthma.

Compliance with Ethical Standards

Conflict of Interest None.

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