Acta Scientific PAEDIATRICS (ISSN: 2581-883X)

Volume 6 Issue 5 May 2023

Editorial

Bronchial Asthma, Wheezing and Respiratory Infection in Children

Evgeny Furman*

Professor, Head of the Department of Faculty and Hospital Pediatrics of the Academician, E.A. Vagner Perm State Medical University, Russia

***Corresponding Author:** Evgeny Furman, Professor, Head of the Department of Faculty and Hospital Pediatrics of the Academician, E.A. Vagner Perm State Medical University, Russia.

Received: March 29, 2023

Published: April 01, 2023

What is the role of viral infections in the development of wheezing and bronchial asthma in children?

Most episodes of wheezing in preschool children are associated with acute respiratory infection, mainly rhinovirus and with respiratory syncytial virus and some others (at an early age). In more than 80% of cases of acute wheezing, one or more respiratory viruses are detected by polymerase chain reaction. Most often, episodes are associated with rhinoviruses, adenoviruses, bocaviruses, respiratory syncytial virus, and a number of others. Preliminary research results indicate that the SARS-CoV-2 virus did not cause an annual increase in the number of episodes of wheezing and asthma exacerbations.

The COPSAC study found that the presence of asthma in a child at 7 years of age is directly related to the number of respiratory viral episodes in the first years of life. Interestingly, not only viruses, but also bacteria of the child's nasopharynx can act as markers-predictors of the recurrent course of wheezing. If bacteria of the genera Granulicatella and Prevotella are repeatedly found in the nasopharynx, this can be considered as "protection" against new episodes of wheezing, and the detection of bacteria of the Neisseria genus in the nasopharynx, on the contrary, predisposes to the recurrence of episodes of wheezing.

As for patients with asthma, they are at risk of more severe outcomes in respiratory viral diseases. It was found that in many patients the reaction of innate antiviral immunity with a deficiency of the immune response associated with lung interferons (IFN-α, IFN-β and IFN-γ) is reduced and/or slowed down. IFN-λ deficiency is associated with more severe asthma exacerbations.

It should be borne in mind that with poor control of asthma, the severity of exacerbation caused by the virus increases dramatically. In particular, viral infection in children with asthma exacerbation is associated with a decrease in therapeutic response to β2-agonists within 24 hours from the onset of clinical manifestations of acute respiratory viral infections. A study of fatal asthma in children and adolescents in Finland found symptoms of acute respiratory infection in 75% of patients. In this regard, the continued use of asthma medications, especially inhaled corticosteroids (ICS), during the novel coronavirus infection pandemic is an important principle supported by the Global Initiative for Asthma (GINA) and many other medical professional societies.

Interestingly, according to the results of the STOIC (STerOids in COVID-19) study, ICS can reduce the incidence of complications of COVID-19 disease not only in patients with asthma, but also in all other patients.

What are the features of diagnosing, monitoring and controlling asthma in children?

There are several diagnostic difficulties in preschoolers. It is necessary to monitor the condition of the child, especially preschool age, especially for repeated episodes of wheezing. It is also necessary to establish the cause and conduct a differential diagnosis of recurrent wheezing, to carry out an instrumental examination in a limited set of methods for assessing the lung function assessment in young children. A special diagnostic approach is required for children under 24 months of age with persistent wheezing without response to therapy with bronchodilators, inhaled and systemic corticosteroids. In this case, fiberoptic bronchoscopy, examination to rule out chronic aspiration, and microbiological examination of bronchoalveolar lavage should be performed.

In children from 3 years old, it is possible to diagnose heterogeneity of pulmonary ventilation, which reflects the involvement of small bronchi, using the methods for multibreath washout tests, with recognition of the lung clearance index.

Recent studies (the CHILD cohort study and the Urban Environment and Childhood Asthma study) show that about five wheezing phenotypes can be identified in children under 5 years of age, but only two of them have a strong association with the development of asthma in children at 5 years of age. Therefore, it is very

important, until the diagnosis of asthma is finally verified, to assess the risk of its development using objective scales and indices, to identify atopy and pay attention to eosinophilia. The most famous and simplest is the API index (asthma predictive index). In general, younger age itself can be considered as one of the risk factors for asthma exacerbation. There are other risk factors as well. For example, vitamin D deficiency has been shown to increase the risk and severity of wheezing.

The principles of monitoring and controlling asthma in children are similar to those in older age groups, with a limited number of control tools, mainly respiratory function. To control the disease in children under 6 years of age, ICS delivered through a nebulizer or other devices should be preferred.