



## RECURRENT RESPIRATORY INFECTIONS IN CHILDREN AS A PRECURSOR OF PRIMARY IMMUNODEFICIENCIES

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Respiratory tract infections in children are one of the most common causes of medical visits and hospitalizations and are associated with significant morbidity and mortality. Respiratory infections are common and frequent diseases and represent one of the main complaints in children and adolescents. The role of physicians and other healthcare professionals has expanded from simply treating illness to implementing measures to maintain health and prevent disease. The appointment and use of each immunomodulating agent should be carried out correctly only in these cases with an individual approach to each child, taking into account all the rules of immunomodulatory therapy.

**Key words:** recurrent respiratory infections, primary immunodeficiency, gastroesophageal reflux, cystic fibrosis.

Respiratory tract infections in children are one of the most common causes of medical visits and hospitalizations, and are associated with significant morbidity and mortality. Respiratory infections are common and frequent diseases and represent one of the main complaints in children and adolescents. The role of physicians and other healthcare professionals has expanded from simply treating disease to implementing measures aimed at maintaining health and preventing diseases [1, 6, 15, 16]. Respiratory infections (RI), mainly affecting the upper respiratory tract, are common in children, and their recurrence is a serious problem for pediatricians. There are many children suffering from so-called recurrent respiratory infections (RRI). A child with recurrent respiratory infections presents a difficult diagnostic problem. Children with a simply manageable cause of symptoms such as recurrent viral infections or asthma must be distinguished from children with more severe underlying conditions such as bronchiectasis or immune dysfunction. Thus, many different diseases manifest themselves including cystic fibrosis, various immunodeficiency syndromes, congenital anomalies of the respiratory tract. According to epidemiological studies, it has been estimated that about 6% of children under the age of 6 have RRI. In developed countries, up to 25% of children under the age of 1 year and 18% children aged 1-4 years experience RRI [2, 4, 13]. At the same time, ENT infections are the most common pathology in children from 6 months to 6 years. Although the etiological agents responsible for RRI are not always easily identified, viral agents are usually the underlying cause. The

real challenge for pediatricians is to distinguish normal children with a high incidence of respiratory infections associated with increased exposure to environmental risk factors from those with other underlying pathological conditions (immunologic or not), predisposing to infectious respiratory diseases. As a rule, there are no obvious changes in children with RRI, and this is mainly the result of increased exposure to infectious agents caused by environmental factors in the first years of life.

Primary immunodeficiencies (PID), are usually the result of genetic defects that affect the component of the immune system. In general, these disorders are rare, with some exceptions such as selective IgA deficiency and mannose-binding lectin deficiency. Most common PIDs are usually asymptomatic or have only mild clinical symptoms.

Examination of children with RRI requires a lot of attention to the history and examination, and in some cases to extensive research. Early and accurate diagnosis is essential to ensure optimal treatment and minimize the risk of progressive or irreversible lung damage. The challenge for doctors is to distinguish a child with self-limiting or minor problems from a child with a serious, possibly progressive, lung disease. The most common and common symptom of recurrent respiratory infections is chronic cough [12, 13, 17, 18, 19]

The diagnostic algorithm should be aimed at excluding the underlying serious disease. The diagnosis of RRI is highly appropriate if:

- more mild respiratory INFECTION characteristics similar to respiratory infections in children with normal respiratory “illness” (Severity. duration. no complications, good response to conventional symptomatic therapy and empiric antibiotic therapy),
- absence of severe and invasive systemic infections,
- absence of inability to develop
- negative family history of immune disorders.

The RRI diagnostic algorithm includes the study of possible causes of chronic cough, such as allergies, asthma,  $\alpha$ -antitrypsin deficiency, primary or secondary paired dyskinesia, congenital anomalies, gastroesophageal reflux (GER), recurrent pulmonary aspiration, postnasal drip syndrome (most common cause of chronic cough in children) [3,4,5]. Recurrent or chronic infections may be associated with anatomical defects that are characteristic of one body system (9,10,11). Foreign body should be suspected when infections are chronic and localized in one anatomical canal, for example, in one ear canal or one nostril. Symptoms in young children with malabsorption or nasal polyps should be re-evaluated for possible cystic fibrosis (CF), in spite of negative result of neonatal screening. The incidence of CF is more common in some countries. Therefore, the combination of the above symptoms is an indication for a sweat test followed by genetic analysis. RRI can also be a sign of re-aspiration of gastric contents in GER, swallowing dysfunction, undiagnosed bronchial asthma, or immobile cilia syndrome. Recurrent otitis media is associated with Eustachian tube dysfunction due to



atopy [12, 13, 14]. GER is commonly associated with asthma symptoms but sometimes it can be confused with bronchitis or lead to aspiration and recurrent pneumonias. GER involved in pathogenesis may also be a factor in recurrent otitis media sinusitis.

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