

Analysis of the Etiological Structure of Respiratory Diseases in Children

Turaev Telman Temirovich

Bukhara State Medical Institute, Uzbekistan

Abstract Reducing the incidence of acute infectious respiratory diseases in children and mortality is currently considered as a strategic direction for the development of pediatric care in modern healthcare. According to modern concepts, innate immunity plays an important role in the implementation of the body's immune response in the early stages of infectious diseases. The authors conducted a study of indicators of humoral and cellular immunity in children to predict the development of emergency conditions in respiratory diseases in children. IgG control in dynamics determines the prognosis of the development of critical conditions in respiratory diseases in children. As an indicator of humoral immunity, IgG plays a complex role in the process of protecting against the re-entry of foreign antigen into the body, which prevents reinfection.

Keywords Cellular immunity, Cytokines, Children, Respiratory diseases, Immune response, Urgent conditions

1. Introduction

Currently, a steady increase in the frequency of respiratory allergic diseases is relevant. Allergies are very often associated with the recurrent nature of the course of respiratory diseases. The symptoms of respiratory atopy can both mimic the symptoms of a respiratory infection, and be the cause of chronic inflammation of the respiratory tract and immunodeficiency, against which the child has frequent infections [4,6].

In recent years, persistent infections caused by representatives of the Herpesviridae family, the primary infection of which in the population of our country occurs more often at preschool age, have become particularly relevant. The immediate and long-term prognosis for a person infected with herpesviruses depends on the presence and severity of immune dysfunction. At the same time, representatives of the Herpesviridae family themselves are capable of causing significant disturbances in the immune status of the macroorganism, causing lymphoproliferation and chronic inflammation [2,5,8].

According to the World Health Organization (WHO), in the global structure of pathologies of children, the incidence of infectious diseases is more than 90%. Infectious agents are the cause of 35% of deaths among children [3].

Over the past 4 years, there has been an increase in the number of children's intensive care units (ICU) by 17.8%, while deaths have decreased by 38% of the total number of cases. Infants, toddlers, and high school age children predominate among all pediatric ICU patients. More than 60%

of the total mortality of patients in children's intensive care units is due to unfavorable outcomes of critical conditions in children of the first three years of life [7].

In Switzerland and Italy, almost 50% of the total number of pediatrician consultations are conducted for acute respiratory diseases (ARI), in the USA acute respiratory infections are one of the main causes of hospitalizations, in the Russian Federation – 90% of outpatient visits and home visits are for respiratory diseases [1,9].

The purpose of the research: study of the etiological structure of respiratory diseases in children.

2. Materials and Methods of Research

280 patients who applied for respiratory symptoms similar to allergies in the periods from 2020-2022 to the advisory polyclinic of the BODMPMC in Bukhara were under observation. The Chi of the square, the two-sided Fisher criterion, the normalized value of the Pearson coefficient and the bond strength for the two-by-two matrix were calculated simultaneously in an online calculator.

3. Results and Discussion

Of all those who applied to the polyclinic for outpatient consultation, boys were 1.35 times more -161 (57.5%) than girls -119 (42.5%). The age distribution of patients showed a predominance of preschool children -185 (66.0%). At the same time, there were 59 (21.0%) young children, 185 (66.0%) preschool children, 25 (9.0%) 8-11 years old and 11 (4.0%) 12-18 years old, Fig. 1.

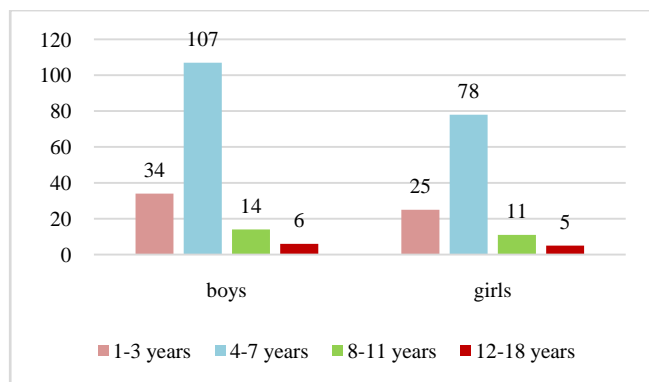


Figure 1. Distribution of sick children by gender and age

Repeated episodes of respiratory diseases were noted in 187 (66.8%) children and concomitant pathologies in the form of adenoiditis, chronic tonsillitis, sinusitis, bronchitis and pneumonia were revealed, which served as the basis for conducting research to develop clear criteria for the differential diagnosis of respiratory allergoses and viral-bacterial diseases in children.

All those selected for the study underwent blood tests for immunoglobulin E, an allergological blood test, immunoglobulin M and G for cytomegalovirus, herpesvirus type I-II and VI, mycoplasma, chlamydia, Epstein Barr virus and candida. If necessary, the sick children were sent to the bacteriological laboratory of the BODMPMC and nasopharyngeal swabs were taken for bacteriological seeding to determine sensitivity to antibiotics.

As a result of the examination of 280 sick children with respiratory symptoms, 174 (62.2%) of them revealed respiratory diseases with persistent infections, 106 (37.8%) patients had respiratory atopy mimicking the symptoms of respiratory infections. Consequently, allergy in children in 37.8% of cases is associated with the recurrent nature of the course of respiratory infections.

The study of anamnesis and conversation with parents, as well as the results of blood tests of sick children for specific immunoglobulins M and G, made it possible to clarify the range of etiological factors in children selected for examination.

In young children (59) with repeated respiratory symptoms similar to allergies (-33 patients, 55.9%):

- mycoplasma infection-7 (21.2%);
- chlamydia-4 (12.2%);
- cytomegalovirus-2 (6.0%);
- herpesvirus infection-5 (15.2%);
- combination of mycoplasma and Candida-6 (18.2%);
- CMV+herpes infection-9 (27.3%), Fig. 2.

As can be seen from Figure 2, in young children there is an increase in cases of combination of CMV with herpesvirus infection-27.3%, as well as cases of Mycoplasma hominis-21.2%. At the same time, it is necessary to take into account the combination of Mycoplasma hominis with Candida, which is 18.2% of cases.

Of all preschoolers with RRI (131), 56 (42.7%) children had monthly episodes of respiratory diseases, 75 (57.3%)

had episodes from 6 to 10 times with a "light interval" all year round.

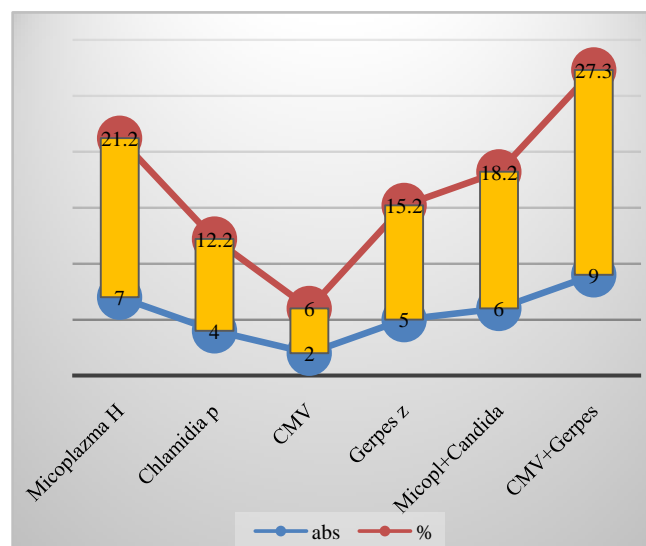


Figure 2. Pathogens of respiratory diseases in young children

The study of the spectrum of etiological factors of respiratory episodes in preschool children showed a predominant increase in cases of combination of CMV with herpesvirus infection - 47 (35.8%) and Mycoplasma hominis with Candida -41 (31.3%). Individual cases of Mycoplasma hominis were in 33 sick children (25.2%), Chlamydia pneumoniae - in 3 patients (2.3%), cases of Candida were detected in 7 (5.4%) patients of preschool age, Fig. 3.

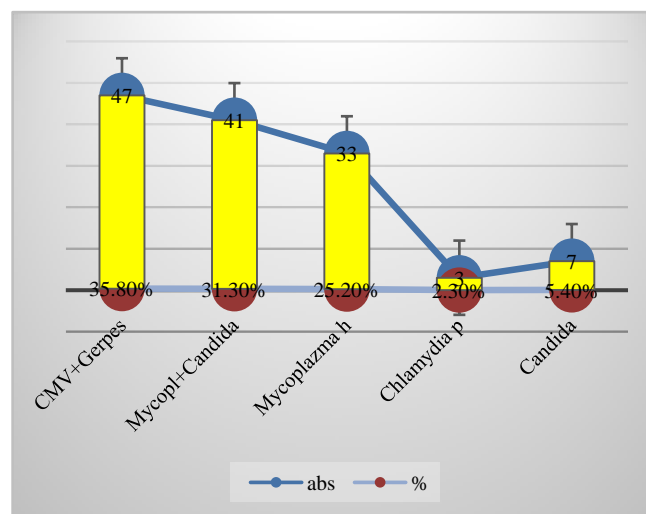


Figure 3. Pathogens of respiratory diseases in preschool children

The presence of other concomitant diseases in school-age children was also characteristic. The obtained results of a study on the spectrum of etiology of respiratory diseases showed the predominance of virus-viral and virus-fungal associations depending on the age of children.

In our studies, of all children aged 8-11 years (25), 7 (28.0%) had RRI, and respiratory allergies were found in 18 (72.0%). In high school students (12-18 years old), in 3 cases (27.3%), RRI was established and 8 children (72.7%) had respiratory

allergies. The results show a 2.6-fold increase in allergy cases in both younger and older school-age children.

Dental caries was also detected-11 (44%), tonsillitis-11 (44%), adenoid vegetation - 7 (28%), sinusitis-7 (28%) as concomitant diseases in children with bronchitis - 15 (41.7%), community-acquired pneumonia-21 (58.3%).

4. Conclusions

Thus, the study of the etiology of respiratory diseases in children made it possible to establish cases of coinfection in children with RRI. Respiratory diseases with persistent infections in our studies account for 62.2%, which is 1.64 times more than the combination with atopy in children.

At the same time, the association of viruses with each other, bacteria with each other, the virus is fungal, the virus is mycoplasmic and parasitic. Age-related features of the association of respiratory pathogens have been established.

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