

Prevalence and antibiotic-associated diarrhea development factors in children with acute respiratory diseases

Popov Serhiy, Smiyan Alexander, Nekhaenko Irina
Sumy State University, Ukraine

Introduction

Acute respiratory diseases (ARI) are one of the dominant pathologies in childhood. During the year, the child can have up to 6-8 cases of ARI. The incidence of ARI is registered throughout the year, most significantly in the autumn - winter period. In the period of epidemics of influenza, up to 90% of children suffer respiratory pathology. Viruses prevail in the etiology of acute respiratory infections, but in some cases bacterial infection may be associated.

The possibility of bacterial infection, the severity acute respiratory disease, duration, age and other factors determine the appointment of antibiotics use. The number of side effects of antibiotic therapy is large and includes the development of allergic conditions, the formation of resistance of pathogenic microflora, intestinal microbiota disorders and the development of antibiotic associated diarrhea (AAD).

Purpose

The aim of the study was to study the prevalence antibiotic associated diarrhea among children with Acute respiratory diseases and identification of factors, that lead to the appearance of AAD.

Methods

The 75 children aged 1 to 12 years who were on treatment in a hospital with a diagnosis of acute respiratory disease, rhinopharyngitis were examined. All of them received antibiotic therapy at age-related doses.

Children were divided into 3 groups according to age, each of them into 2 subgroups depending on the presence or absence of signs of AAD. Antibiotic-associated diarrhea was defined as 3 or more cases of loose stool after antibiotic use. The 27 children aged from birth to 3 years were included in group 1, in group 2 - children from 3 to 6 years, in group 3 - children from 7 to 12 years old.

The features of anamnesis of life, disease, clinical signs were evaluated. The obtained results were processed by the methods of descriptive statistics, obtaining odds ratios.

Results

Among all the children studied, the frequency of development of the antibiotic associated diarrhea was 52%. AAD was more common in young children than in the elder. The literature data indicate that the AAD frequency can range from 5 to 60%.

Dependence of development of AAD on age is indicated by some authors⁷ for children 2 years and under. At the same time, other researchers deny the existence of such a connection.

Table 1. Prevalence antibiotic-associated diarrhea

	Group 1 (27)	Group 2 (29)	Group 3 (19)	Total (75)
Antibiotic-associated diarrhea, n/%	16/59,3	14/48,3	9/47,4	39/52

Most often, AAD developed in children receiving penicillin line - amoxicillin, 92% of all children, who received this antibiotic. Less often antibiotic associated diarrhea was detected in children who received cephalosporins third generations - 86%. The frequency of development of AAD with the use of macrolides was the lowest - in 25% of children who received these antibacterial drugs. The literature data indicate the frequent role of amoxicillin with clavulonic acid in the development of AAD, that confirms our data.

The conditions, the frequency of which was increased in children with antibiotic associated diarrhea, were identified (Fig.1). Among them was a large proportion of patients born prematurely, but the value of odds ratio, that showed relations between premature and AAD was not reliable. At the same time, the presence of functional disorders at child, such as diarrhea and vomiting, increased the risk of developing AAD. The pathogenesis of the development of functional disorders is associated not only with the disruption of the "brain-intestine" relationship, but also by changes in the level of activity of the central nervous system, microbiota composition, and immune status. Perhaps these factors are important for the early development at these children of the AAD. This also confirms the high probability of allergic conditions of children for the development of the AAD, which we found.

The condition of the parents was also important for the development of the AAD in the child. The highest relationship was observed between parental allergies and stool disorders with the development of antibiotic associated diarrhea in a child.

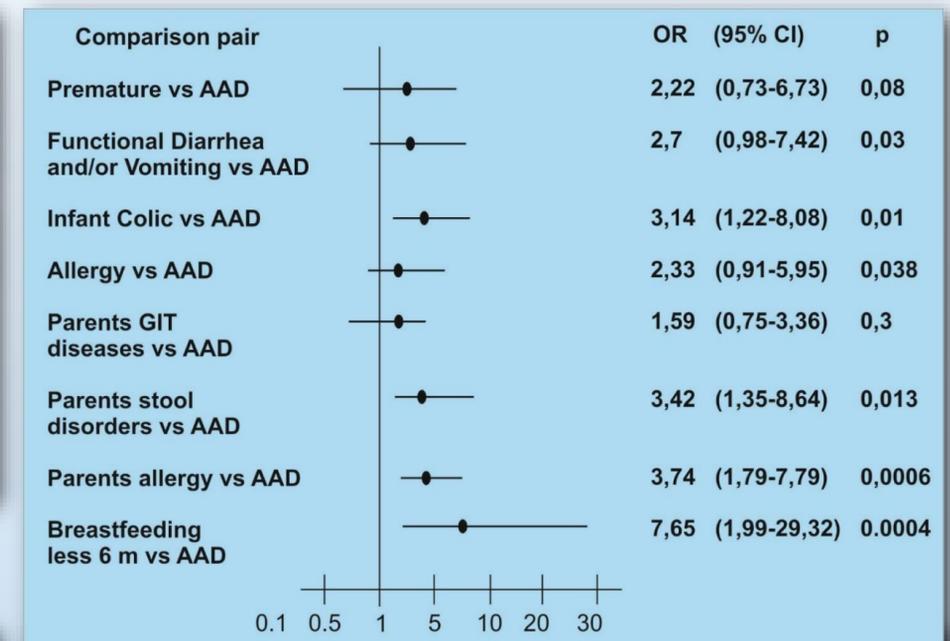


Fig.1. Effect of selected characteristics on development of the antibiotic associated diarrhea

The presence of functional disorders in the child and parents and the relations them with the AAD may indicate the role of hereditary factors in the formation disorders of the brain-intestinal relationship. Perhaps a certain role in the violation of these relationships plays preterm birth. Recently, a significant amount of data supports high incidence various diseases in children different age, which born prematurely.

A significant increase in the chances of developing AAD was observed if breastfeeding lasts less than 6 months. The role of breastfeeding in the development of the microbioma and the immune system is extremely high. The preventive effect of breastfeeding duration on the degree of deficiency of normal microflora is also noted by some authors.

Conclusion

Thus, in children with ARI and prescribed antibiotic therapy, the risk of developing antibiotic-associated diarrhea can be determined by a hereditary anamnesis concerning the disorders of the gastrointestinal tract in the parents, the presence of functional disorders of the gastrointestinal tract and allergies in the history of life in the child itself, a variant of antibiotic therapy. At the same time, prolonged breastfeeding is important for prevent of the development of antibiotic-associated diarrhea.