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THE INFLUENCE OF GENETIC PREDISPOSITION ON THE DEVELOPMENT AND COURSE OF STENOSING LARYNGOTRACHEITIS IN CHILDREN

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Abstract: Resume. Features of acute stenosing laryngotracheit (ASLT) in children, there is a predominant occurrence at an early age and a rapid increase in the picture of acute respiratory failure. The study of the genetic aspects of the development of ASLT, especially its continuously recurrent course, with further transition to a chronic non-specific disease, is currently given insufficient attention. In our opinion, the hereditary predisposition of patients to ASLT plays an important role in the development of the disease in children.

Keywords: Children, acute stenosing laryngotracheitis, primary and recurrent laryngotracheitis, premorbid background, genetic predisposition.

Relevance. At present, our country has carried out large scale program measures to radically change the quality of medical care for the population, reform the healthcare sector, and introduce an effective model of the healthcare system. As a result of these measures, positive effects were achieved in the diagnosis and treatment of bronchopulmonary pathology in children [1, 5].

Acute respiratory infections still occupy a leading place in the structure of infectious pathology in childhood. In recent years, the number of diseases associated with bronchial obstruction syndrome has increased worldwide. Patients with a family history burdened by allergies get sick more often in 30-40% of cases, which is also typical for children who suffer from respiratory infections more than 6 times a year. Acute stenosing laryngotracheitis (ASLT) is one of the most frequent and severe manifestations of acute respiratory viral infections accompanied by respiratory disorders [1,2,6,8].

ASLT belongs to the category of life-threatening conditions, that require urgent medical and diagnostic intervention. Features of acute stenosing laryngotracheitis in children are the polyethology of this condition, the predominant occurrence at an early age.

Purpose of the work. To study the role of genetic factors on the formation and recurrent course of acute stenosing laryngotracheitis on the basis of a genealogical history by the example of Urgut population of children's population Samarkand region.

Material and methods. To assess the hereditary predisposition for atopic diseases and bronchopulmonary pathologyбыло , a thorough genealogical study was conducted of 97 children with ASLT who were hospitalized in the States Samarkand branch of the Republican Scientific Center for Emergency Medical Care (SFRNCEMP) and Clinic № 2 SamGosMI during 2020-2024., from the number of patients living in Urgut district of Samarkand region. In general, the population of the Urgut district prevails over other residents of the Samarkand region in terms of hospital visits for ASLT.

The analysis of genealogical history was carried out with the assessment of the burden of family history with atopic diseases according to the burden index of L. N. Machulina (2005) [3]. Our selection of patients did not include children with ARI complicated by acute obstructive bronchitis, acute pneumonia, or acute bronchiolitis. To study the role of genetic factors on the formation and recurrent course of acute stenosing laryngotracheitis in children by the example of Urgut. The genealogical history of 97 children who received inpatient treatment for acute stenosing laryngotracheitis was studied in the Urgut population of children. Urgut district, Samarkand region, aged from 3 months to 5 years. To identify a hereditary predisposition for the development and recurrence of the disease, we studied the genealogical history of the parents of children, carefully studied the data on the transmitted diseases of parents and relatives. Additionally, data on previous pregnancies and the course of current pregnancy and childbirth, early and late neonatal period were studied.

Assessment of hereditary predisposition for bronchopulmonary pathology and atopic diseases according to the method of L.N.Machulina was carried out in 3 stages [3]. First of all, we made a genealogical map of the family for all the examined people. Moreover, each examined sick child with ASLT had a family tree compiled with the number of generations of at least 3, which reflected the presence or absence of hereditary diseases. A genealogical history with a detailed genealogical tree of the examined people was displayed in a specially developed program at the Department of Pediatrics SamSMU On the map itself. Next, a mathematical calculation was performed to determine the total burden of the genealogical history with the calculation of the burden index using the following formula:

$$IO = \frac{\text{Total number of diseases for all known relatives}}{\text{Total number of proband relatives}}$$

To calculate the burden index, the total number of diseases detected by us for all known relatives of each subject was divided by the total number of relatives of the proband. We interpreted the conclusion about the severity of anamnesis in cases where the IO was more than 0.7.

In the course of the study, special attention was paid to the genealogical atopic history, the history of maternal and paternal history, the index of genetic burden for respiratory and allergic diseases was calculated, tests indicating the possibility of developing asthma were performed, their sensitivity, specificity and prognostic value were evaluated. To determine the direction of the burden of a genealogical history with the calculation of the burden index for bronchopulmonary (respiratory) pathology, the following formula was used:

$$INI = \frac{\text{Total number of bronchopulmonary diseases for all relatives}}{\text{Total number of proband relatives}}$$

To calculate the burden orientation index (INI), the total number of bronchopulmonary diseases detected by us for all known relatives of each examined person was divided by the total number of relatives of the proband. The conclusion about the history burden for this nosological group, in this case for bronchopulmonary pathology, was made in cases where the INI was more than 0.4.

Then we started to determine the direction of the burden of the genealogical anamnesis with the calculation of the burden index for atopic (allergic) diseases using the following formula:

$$INI = \frac{\text{Total number of atopic diseases for all relatives}}{\text{Total number of proband relatives}}$$

To calculate the burden orientation index (INI), the total number of atopic diseases detected by us for all known relatives of each subject was divided by the total number of relatives of the proband. The conclusion about the history burden for this nosological group, in this case for atopic diseases, was made in cases where the INR was more than 0.4. The clinical characteristics of the examined patients were based on the study of the characteristics of the premorbid background, risk factors of the seasons of the year, and the severity of the underlying disease.

The results obtained and their discussion. There were - 62 boys and 35 girls among all surveyed. According to the severity of stenosis, the patients were distributed as follows: out of 97 patients, acute stenosing laryngotracheitis of the I degree was diagnosed in 33 children, II-degree in 62, and III-degree in 2 children. The majority of children (78%) developed laryngeal stenosis in the first two days after the onset of acute respiratory infection. In 85% of patients, croup syndrome developed at night.

Repeated episodes of acute stenosing laryngotracheitis were observed mainly in children over 3 years of age. According to the goals and objectives, to study the course of acute stenosing laryngotracheitis depending on the presence of risk factors and to assess the hereditary predisposition for respiratory pathology and atopic diseases, we conducted a genealogical study of 97 children with ASLT living in the United States.In the Urgut district of the Samarkand region. A characteristic climaticand geographical feature. The main feature of the Urgut region is that the indigenous people in this free economic zone have been intensively engaged in tobacco production and processing for many decades.

The analysis of genealogical history was carried out with an assessment of the burden of family history with atopic diseases according to the burden index of L. N. Machulina (2005). At the same time, special attention was paid to the genealogical atopic history, the severity of allergic history on the maternal and paternal lines, the index of genetic burden for this pathology was calculated, tests indicating the possibility of developing bronchial 162 asthma (BA) were performed, their sensitivity, specificity and prognostic value were evaluated.

To study the influence of risk factors on the course of the disease, patients were divided into 2 groups. I-Group I - 50 children with recurrent episodes of recurrent stenosing laryngotracheitis (RSLT) and II-group II-47 children - with the first and only episode of stenosing laryngotracheitis (PSLT).

The analysis of our material showed that the development of laryngeal stenosis in patients with recurrent stenosing laryngotracheitis depends on a combination of many factors, age differences, the presence of concomitant diseases, various risk factors, etc. So, we found that 42% of children had a hereditary burden of allergic diseases. In children with IIgrade II stenosis, as well as in children of the first year of life, this indicator was higher (63.9%) than in children with Igrade I stenosis-34%.

The most common type of asthma was that of 24% of parents and immediate family members. Thisfact allows us to concludethat the presence of bronchial asthma in direct relatives can contribute not only to the early occurrence, but also to the aggravation of acute stenosing laryngotracheitis in children. As mentioned above, the purpose of studying the genealogical historyлось was to obtain reliable information about the presence of hereditary diseases, the state of health of family members and other close relatives. To identify hereditary predisposition to bronchopulmonary pathology and atopic diseases, we studied the genealogical history of the parents of children, carefully studied the data on the transmitted diseases of parents and relatives in the past the Urgut population of children.

It was found that the genealogical history of respiratory diseases in group I children was burdened in 35.6% of children, but in group II children with PSLT-in 26.9% of patients (P>0.05). We also found that in group I children with recurrent croup, the genealogical atopic history was burdened in 42.4% of children, and in group II children with PSLT-in 31.6% of patients (P>0.05).

Both maternal (32.3%) and paternal (21.5%) lineages were slightly more common in children with PSLT than in children with MSLT (24.6% (P>0.05) and 15.8% (P>0.05), respectively). The proportion of children with bronchopulmonary burden for both parents in both groups was almost the same and did not exceed 6%.

Studying the features of the genealogical history of atopic patients in children, we found that children with RSLT was more often recorded burdened allergic history as the maternal (35,3%) and paternal (22.4%) of the lines than in children with PSLT (21,8% (P>0.05) and 18.4% (P>0.05), respectively).

The number of children with atopic burden for both parents in both groups was almost the same and was within 6%. Despite the fact that among the examined group II, children with a burdened genealogical respiratory history were somewhat more common, the tendency to the highest burden index for this pathology was found in children of group I (0.21±0.018 CU vs. 0.19±0.017 CU, P>0.05), which is associated with a large percentage of the closest relatives who had atopic diseases.

Thus, the tendency to a high burden index for respiratory and atopic pathology was higher in children with recurrent acute stenosing laryngotracheitis. Next, we calculated the index of genetic diseases history of bronchopulmonary pathology, which was characterized by a sensitivity of 41% (95% CI 22-60), specificity of 63% (95% CI 47-79), the predictive value of a positive result - 46% (95% CI 25-67), the predictive value of a negative result - 60% (95% CI, 43-75), with a likelihood ratio of a positive result - 1,25. The relative risk of recurrence relapse was 1.1 (95% CI, 0.6-2.2), with a chance ratio of 1.5 (95% CI, 0.5-4.1).

With regard to the studied indicators of the genetic history of atopic diseases, we identified the value of this test more than 0.2 in.e. This test indicates the possibility of development of ad, characterized by a high sensitivity of 42% (95% CI 23-62), high specificity was 65% (95% CI, 49-81), the predictive value of a positive result - 48% (95% CI 27-69), the predictive value of a negative result - 62% (95% CI 45-77), with a likelihood ratio of a positive result to 1.27. The relative risk of recurrence of the disease was to 1.2 (95% CI 0,7-2,4), with an odds ratio of 1.5 (95% CI 0,5-4,2).

Thus, as a result of the presence of associative links between bronchopulmonary pathology and atopic diseases in parents, primarily with bronchial asthma and with a recurrent course of ASLT, the disease should be considered as genetically determined.

Inepisodes. For 1/4 of parents and direct relatives of children had bronchial asthma, which can contribute not only to the early onset, but also to the severe recurrent course of ASLD in children. In patients with RSLT in the studied population of children. The Urgut district of the Samarkand region has a high hereditary burden of respiratory diseases, and children with RSLT also have a high hereditary burden of atopic pathology. Risk factors in combination with genetic factors not only have a negative impact on the course of the disease, but can further predispose to the recurrent course of the disease and the development of asthma in children. The revealed high hereditary burden of bronchopulmonary pathology and atopic diseases will allow us to conclude that in. In the Urgut population of children, there is a "programmed" genetic risk of morbidity based on bronchopulmonary pathology.

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