

THE CLINICO-ANAMNESTIC EFFICACY OF CONTROLLER THERAPY OF THE PERSISTENT BRONCHIAL ASTHMA IN CHILDREN WITH EARLY AND LATE ONSET OF THE DISEASE

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The results of the clinical efficacy of basic treatment of children with bronchial asthma have been presented. We examined 50 patients aged 6-18 years. It has been found that patients with a late-onset phenotype of asthma had a higher risk of disease exacerbations with hospitalization. At once the frequency of daily and nocturnal symptoms, using short-acting β_2 -agonist was higher in the patients with early onset of the disease. The data shows a prevalence of controlled asthma in school-children with late onset of the disease compared with patients who suffer from the disease from the first three years of life.

Keywords: bronchial asthma, children, prophylactic therapy, phenotype, control.

Formulation of the problem. The substantial increase in the prevalence and incidence of bronchial asthma in the world over the past few decades has been reported in many epidemiology studies [1, p. 181]. If the current trend continues, it is estimated that there may be an additional 100 million more asthmatics by 2025 [2].

Analysis of recent research and publications. According to modern concepts, the basis of asthma is a chronic allergic airway inflammation with the presence of immune disorders that require long-term anti-inflammatory therapy [3, p. 639]. Despite the concept of international consensus documents which states that the control under the symptoms of the disease can be achieved in persons who used prophylactic treatment [4], in practice aspect is dominated persons with partly or uncontrolled asthma [5, p. 66]. This leads to a high frequency of hospitalizations and increased social disadaptation of sick children. Thus the annual increase in the cost of treatment and prevention of this disease [6, p. 146]

Inadequate effect from the proposed scheme of the basic therapy enables researchers to consider that bronchial asthma not as a single disease but a group of asthmatic diseases. Such different «phenotypes» of asthma may vary in response to treatment, prognosis, inflammatory patterns and in susceptibility to environmental exposure [7].

This leads to increase the number of scientific studies concerning the identification of potential phenotypes and endotypes of bronchial asthma and more widespread application of individualized approaches to diagnostics, treatment and prevention of the disease in recent years [8, p. 327].

Thus, it is important to determine the effectiveness of symptomatic and prophylactic therapy in children with bronchial asthma with alternative phenotypes depending on the onset of the disease.

Purpose of the article. To justify and evaluate the effectiveness of symptomatic and basic anti-inflammatory therapy in children with early and late onset persistent bronchial asthma.

Materials and methods of investigation. On the base of the Children Clinical Hospital (Chernivtsi) retrospectively were examined 50 children who are afflicted with bronchial asthma. Key inclusion criteria were:

- Age of the children from 6 to 17 years;
- Diagnosed of persistent bronchial asthma;
- Using the basic medications during at least the last three months

- Availability of information consent of parents and children.

Key exclusion criteria were:

- Age less than 6 and over 18 years;
- Intermittent variant of bronchial asthma;
- Active smoking more than ten cigarettes per day;
- Duration of illness less than three months;
- Using the drugs that could affect the results of research;
- Orphans;
- The presence of congenital malformations of the bronchi or lung and other diseases associated with bronchial obstruction syndrome.

According to the terms of asthma symptoms manifestation, have been formed two groups of monitoring. The first (I) group included 25 patients whose first episode of illness occurred before the age of three, the second (II) clinical group formed 25 patients, in which the appearance of asthma symptoms was observed after six years of life.

General clinical characteristics of patients' comparison groups are presented in table 1.

Table 1
**Clinical features in the patients of both groups
($M \pm m$)**

Group	Number of observations	Male, %	Urban residents, %	Median age, years
I group	25	72,0 \pm 9,0	32,0 \pm 9,3	11,36 \pm 0,67
II group	25	80,0 \pm 8,0	44,0 \pm 9,9	12,78 \pm 0,66
Pt, ϕ		>0,05		

Any significant differences in severity of bronchial asthma and concomitant allergic disease were not observed. Patients with severe variant of the illness prevailed in both clinical groups (76,0 \pm 8,5% та 68,0 \pm 9,3% in I and II clinical groups, $P\phi > 0,05$). In the majority of children was noted availability of other atopic symptoms (52,0 \pm 9,9% in patients with early and 60,0 \pm 9,8% in children with late onset of bronchial asthma, $P\phi > 0,05$)

No significant differences by sex, age, and place of residence have been shown a correctly formed clinical comparison group.

We studied the clinical characteristics of the disease (frequency of daily and nocturnal symptoms, limitations of activities, need for reliever treatment,

and episodes of exacerbations). In order to identify the level of control was used the clinical-instrumental assessment. This questionnaire includes seven questions that reflect the main symptoms of bronchial asthma (each question was estimated from 0 to 4 points) and the indices of respiratory function (forced expiratory volume at 1 sec and peak expiratory flow) [9, p. 20]. Ten points or less allows us to identify controlled, 11-16 points associated with partly and above 17 points – with uncontrolled bronchial asthma.

The obtained results of the study were analyzed using computer programs «STATISTICA 6.0» StatSoft Inc. and Excel XP for Windows with parametric and nonparametric methods. Assessment of the risk implementation events was calculated by attributive (AR) and relative risks (RR), and odds ratios (OR) [10, p. 134]

The main material. In children of both clinical groups despite receiving inhaled corticosteroids during the last three months, was observed the episodes of asthma exacerbations that required hospitalization in profile department. Among patients of clinical group I the frequency of exacerbations was slightly lower and amounted to $32,0 \pm 9,3\%$, in schoolchildren with phenotype of late onset this sign was $56,0 \pm 9,9\%$, $P > 0,05$. AR of the exacerbations was $24,0\%$, RR – $1,54$ (95% CI 0,82 to 2,90), OR – $2,70$ (95% CI 0,85 – 8,57) in patients with bronchial asthma which started after 6 years. Thus, patients with late debut of onset were in 2,7 times more likely to be admitted to hospital with asthma attacks. The frequency of the main clinical symptoms of asthma in patients of both groups has been shown in fig. 1.

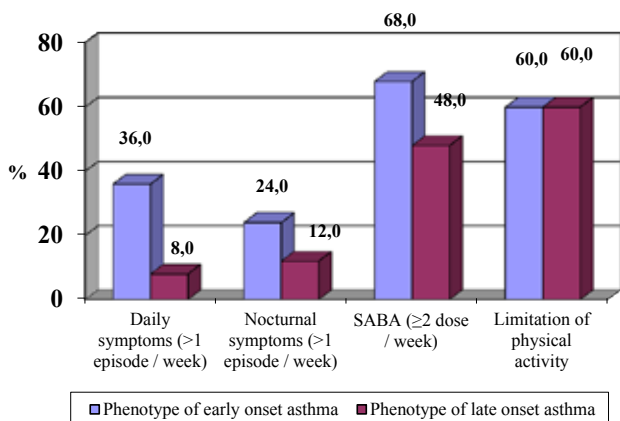


Fig. 1. The frequency of the bronchial asthma characteristic signs in the patients of both groups

Note. * $P < 0,05$ between clinical groups

The risks to have more than one episode of daily symptoms of bronchial asthma for a week in the school-age children with early onset asthma phenotype were higher relatively to the patients whose symptoms manifested after six years: AR – $28,0\%$, RR – $1,44$ (95% CI 0,40-5,17), OR – $6,47$ (95% CI 1,23-34,01). Also the risks of the frequency of nocturnal signs (AR – $12,0\%$, RR – $1,16$; 95% CI 0,44-3,04; OR – $2,32$; 95% CI 0,51 – 10,54) and the use of short-acting β_2 -agonists (AR – $20,0\%$; RR – $1,63$; 95% CI 0,94-2,81; OR – $2,30$; 95% CI 0,73-7,27) in the patients if the first clinical group were higher relative to the students from the second one. Thus, in patients with phenotype of early onset bronchial asthma, the chances of the presence nightly symptoms and use of symptomatic medications were higher in 2,5 times, the presence of daytime symptoms were higher almost in 6,5 times compared with the children from

clinical group II. The frequency of the patients in both groups who felt the limitations of physical activity was identical.

Among patients with early debut of bronchial asthma the frequency of symptoms had the following relationships with anamnestic characteristics. The frequency of daily symptoms have been significantly correlated with duration of disease ($r = 0,46$; $p < 0,05$), the incidence of nocturnal symptoms have been shown in a direct relationship with aggravating allergic history ($r = 0,55$, $p < 0,02$). Also have been revealed a tendency in a direct relationships between physical activity limitation and body mass index ($r = 0,42$, $p > 0,05$), between physical activity limitation and aggravating allergic history ($r = 0,43$, $p > 0,05$).

However among school-age children with late onset bronchial asthma was observed significantly relationship between the frequency of specific symptoms and place of residence. So, living in the rural areas has been correlated with greater frequency of daytime ($r = 0,72$, $p < 0,01$), nocturnal symptoms ($r = 0,53$, $p < 0,05$), using the symptomatic therapy like short-acting β_2 -agonists ($r = 0,45$, $p < 0,05$) and limitation physical activity ($r = 0,63$, $p < 0,01$). Have been shown relationship between duration of disease and frequency of nightly episodes of asthma ($r = -0,28$, $p > 0,05$), female sex and the number of using doses of β_2 -agonists for the week ($r = 0,35$, $p > 0,05$). However, these correlations have not received significant differences.

Thus, in the children of the first clinical group significantly dominated frequency of daily symptoms, whereas among patients with late debut of asthma has been observed in 2.7 times a higher risk of hospitalisation with asthma exacerbation.

However, taking into account the subjective patients' evaluation of the disease symptoms, in-depth analysis of the clinico-anamnestic criteria with a questionnaire of clinico-instrumental evaluation of the level of bronchial asthma control has been conducted.

The average value of clinico-instrumental evaluation in both groups have not been significantly different and was $21,74$ (95% CI: 18,41-25,06) and $17,40$ (95% CI: 14,38-20,41), $P < 0,05$. The frequency of the controlled, partly controlled and uncontrolled bronchial asthma depending on the results of clinico-instrumental assessment has been presented in fig. 2.

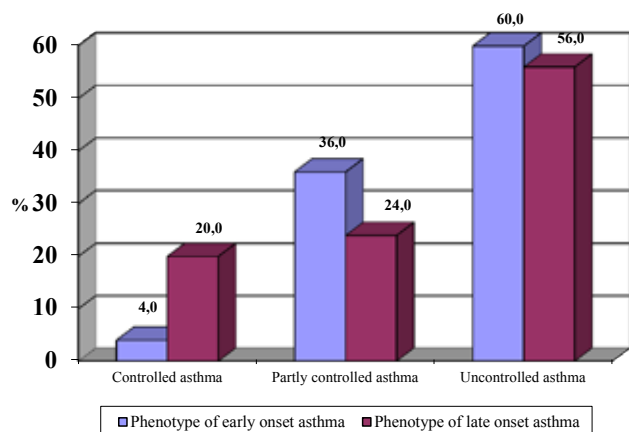


Fig.2. The frequency of the levels of asthma control in the patients of both clinical groups

The data shows a slight prevalence of patients with controlled asthma in a cohort of children with phenotype of late onset asthma over partly controlled among schoolchildren who suffer from the disease from the first three years of life. However, it has

been noted an uncontrolled level of the bronchial asthma in majority of patients in both clinical groups.

In assessing the effectiveness of basic treatment, it has been established that basic use of IGCS reduced the absolute risk of uncontrolled asthma by 4,0% in children with early onset of the disease with reduction of relative risks being 6,67%(95% CI: 2,61-13,53%), and the number needed to be treated – 15,0 (95% CI: 8,64-23,54). However attributive risk to not achieved control of bronchial asthma in children of the first clinical group was 16,0%, relative risk of 1,2 (95% CI: 0,20-7,33) with odds ratio – 6,0 (0,65 -55,66).

The correlation analysis has been allowed to reveal significantly direct relationship between body mass index and clinico-instrumental assessment ($r=0,54$, $p<0,05$) in patients with early onset asthma. This result has allowed us to recommend more aggressive tactics of initial preventive therapy in overweight

children with early debut of bronchial asthma. Other clinical parameters do not have any significant differences with the questionnaire of clinico-instrumental evaluation of disease control.

Conclusions and suggestions. Patients with phenotype of late onset asthma as opposed to the children of first clinical group, had a higher risk of disease exacerbation: an additional risk was 24,0%, relative risk – 1,54 (95% CI: 0,82-2,90), odds ratio – 2,70 (95% CI 0,85-8,57). In the patients with early onset asthma phenotype in the presence of risk factors such as disease duration, aggravating allergy history and increasing body mass index should be recommended to start basic therapy with the «step up» tactic. In contrast, among the patients with late debut of bronchial asthma living in rural areas should be proposed educational program with scheduling of personal asthma action plans and prescribe preventive treatment to «step up» scale.

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КЛІНІЧНО-АНАМНЕСТИЧНА ЕФЕКТИВНІСТЬ КОНТРОЛЮЮЧОЇ ТЕРАПІЇ ПЕРСИСТУЮЧОЇ БРОНХІАЛЬНОЇ АСТМИ У ДІТЕЙ З РАННІМ ТА ПІЗНІМ ПОЧАТКОМ ЗАХВОРЮВАННЯ

Анотація

У статті наведені результати клінічно-анамнестичної ефективності базисного лікування дітей, хворих на бронхіальну астму. Обстежено 50 пацієнтів віком 6–18 років. Встановлено, що школярі з фенотипом астми пізнього початку мали вищий ризик виникнення загострення хвороби, що супроводжувалося госпіталізацією. Водночас, частота денних, нічних симптомів захворювання, використання швидкодіючих β_2 -агоністів була вищою серед пацієнтів з раннім початком бронхіальної астми. Контрольований варіант бронхіальної астми виявлявся частіше серед школярів з пізнім початком захворювання порівняно з пацієнтами, в яких симптоми маніфестували до трьох років.

Ключові слова: бронхіальна астма, діти, профілактична терапія, фенотип, контроль.

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КЛИНИКО-АНАМНЕСТИЧЕСКАЯ ЭФФЕКТИВНОСТЬ КОНТРОЛИРУЮЩЕЙ ТЕРАПИИ ПЕРСИСТИРУЮЩЕЙ БРОНХИАЛЬНОЙ АСТМЫ У ДЕТЕЙ С РАННИМ И ПОЗДНИМ НАЧАЛОМ ЗАБОЛЕВАНИЯ

Аннотация

В статье приведены результаты клинико-anamнестической эффективности базисного лечения детей, больных бронхиальной астмой. Обследовано 50 пациентов в возрасте 6-18 лет. Установлено, что школьники с фенотипом астмы позднего начала имели более высокий риск возникновения обострения болезни, требующей госпитализации. В то же время, частота дневных, ночных симптомов болезни, использования быстродействующих β_2 -агонистов была более высокой среди пациентов с ранним началом бронхиальной астмы. Контролируемый вариант бронхиальной астмы обнаруживался чаще среди школьников с поздним началом заболевания сравнительно с пациентами, у которых симптомы манифестировали до трех лет.

Ключевые слова: бронхиальная астма, дети, профилактическая терапия, фенотип, контроль.