**УДК 616.248-059.3-085**

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# THE MODERN POSSIBILITIES OF INCREASING THE EFFICIENCY OF BASIC ANTI-INFLAMMATION THERAPY OF SCHOOL-AGE CHILDREN'S BRONCHIAL ASTHMA

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*Summary. The effect of Nucleinat included in the basic therapy of bronchial asthma (BA) has been analyzed by means of double-blind, placebo-controlled method in 98 school age children. Two clinical groups were formed with the help of the table accidental numbers. The application of the Nucleinat in complex anti-inflammatory therapy of the BA was accompanied by decrease of bronchial hyperresponsiveness due to the possible reduction of the inflammatory process activity in the airways. The use of Nucleinat in the basic therapy of the school-age children significantly reduced the risk of moderate bronchial responsiveness: DAR – 28,5%, DRR – 54,8%, MNT – 1,8 (95% CI 0,1-7,1).*

*Key words: children, bronchial asthma, bronchial hyperresponsiveness, Nucleinat.*

**Introduction.** According to the Global Strategy for prevention and treatment of bronchial asthma [8], the main goal of treatment of children's bronchial asthma (BA) are achieving and maintaining control over the clinical manifestations of disease. It is believed that adequate therapy to control clinical manifestations of asthma [6]. However, in certain parts of patients develop asthma that is difficult to treat [7]. Thus, according to Russian scientists [2, 4], the effectiveness of standard anti-inflammatory therapy scheme promotes stabilization of clinical and functional parameters of only 60% of patients. This phenomenon is probably connected with the existence of different phenotypes of asthma, which currently is not exactly studied [11, 10]. One

of them can be considered a genetically determined relative insensitivity to children glucocorticosteroids (GCS), which is the foundation of basic therapy of the disease [15]. The insufficient effectiveness of the inhalation glucocorticosteroid (iGCS) is giving proof of the use new medications which can improve of the BA.

In our view, this drug can be considered Nuclienat that is immunomodulator and at the same time, possesses anti-inflammatory action [3, 13]. Thus, the use of Nucleinat in combined anti-inflammatory therapy of asthma in adults resulted in increased control of the disease [1], which may justify the use of such therapeutic approach in patients of school age.

**Purpose of the study**: To increase the effectiveness of the basic therapy with the use of Nucleinat in its complex for the treatment of school-age children's BA.

**Material and Methods**: Altogether, 98 school-age children with bronchial asthma in the period of remission were subjected to complex examination. The examinations were conducted by a double blind, randomized, placebo controlled method. Using the table of random numbers, all the patients were divided into two clinical groups. The first (I) group consisted of 47 patients, which were administered Nucleinat in a dose of 0.25 g/day for 21 days as an addition to the combined basic therapy. The second (II) group was consisted of 51 patients, which instead of Nucleinat were administered placebo. The groups did not differ significantly by age, duration of disease, levels of bronchial asthma control or type of anti-inflammatory therapy.

The first clinical group consist of 32 boys (68,0%) and 15 girls (31,9%). The second clinical group consist of 31 boys (60,8%, $P\varphi>0,05$) and 20 girls (39,2%, $P\varphi>0,05$). The middle child's age was 11,7±0,5 years at the basic groups and 12,3±0,4 years ($P>0,05$) at the control group.

According to the classifications of the BA, which is in the GINA-2006, there were 5 children (10,6±4,5)% with controlled asthma at the first group and 9 patients (17,6±5,3)% at the second ($P>0,05$), 24 children (51,1±7,1)% with partly controlled asthma I group and 32 (62,7±6,8)% sick children II group ($P>0,05$). Uncontrolled

bronchial asthma was in 18 children (38,3±7,1)% at first group and in 10 ill (19,6±5,5)% at second (P<0,05).

In addition to the generally accepted clinical examinations, there was performed the determination of respiratory tract hyperesponsiveness with the use of a portable calibrating spirograph MicroLab (Micro Medical). Bronchial hypersensitivity was estimated by the findings of an inducing dose of histamine, which resulted in a 20% reduction of $FEV_1$ ($PC_{20}H$), a cumulative dose ($PD_{20}H$) [14, 5] with the use of histamine serial dilution and dose-dependent curve (DDC) [9].

The obtained results of the study were analyzed using the computer package licensing program "STATISTICA" StatSoft Inc. and Excel XP for Windows on a personal computer using parametric and nonparametric methods of calculation. Risk assessment of the events held in view of the relative risk (RR), absolute risk (AR), odds ratio (OR) and determination of their confidence intervals (95% CI). The effectiveness of the treatment was evaluated taking into account to decrease of the absolute risk (DAR), relative (DRR) risk, as well as the minimum number of patients (MNP), which should be treatment to get one positive result.

**Results and Discussion**: Following the therapy conducted out in both the groups, there were revealed reductions in bronchial hypersensitivity in form of elevated both the inducing and cumulative doses of histamine. However, significant elevations in $PC_{20}H$ and $PD_{20}H$ were only noted in the first group patients, while a trend towards elevations of these parameters was noted in the second group patients (Tabl. 1).

**Table 1**

**Parameters of the respiratory tract hypersensitivity in patients of the both clinical groups**

| Group / Therapy | $PC_{20}H$ (mg/ml) | | $PD_{20}H$ (mg) | |
|---|---|---|---|---|
| | I group (n=47) | II group (n=51) | I group (n=47) | II group (n=51) |
| Prior to the therapy | 1,3±0,2 | 1,7±0,3 | 0,29±0,05 | 0,37±0,06 |
| Following the therapy | 2,8±0,5 | 2,2±0,4 | 0,6±0,1 | 0,48±0,1 |
| P | P<0,05 | P>0,05 | P<0,05 | P>0,05 |

At the end of treatment in children which in complex anti-inflammatory therapy received Nucleinat, noted the likely reduction of patients with a value of cumulative doses of histamine provokes (PD20H) less than 0,13 mg in contrast to the control group of persons. Thus, in the first group of clinical indicators PD20H, below the specified level registered in 20 persons (42,5 ± 7,2%) to the proposed therapy and only 10 patients (21,2 ± 5,9%, P<0,05) after its completion. In the comparison group indicated bronchial sensitivity to histamine was determined in 21 children (41,1 ± 6,8%) and in 20 patients (39,2 ± 6,8%, P>0,05), respectively. However, in children who received Nucleinat in complex basic therapy, signs of airway hypersensitivity decreased in 70,2% of patients and in those taking placebo, only 41,8% of cases (Rφ<0,05).

At the same time, the number patient with airway hyperreactivity in first clinical group was significantly decreased after our proposed therapy. So, in children which in complex anti-inflammatory therapy received Nucleinat the dose-dependent curve more then 0,9 arbitrary units registered in 42 persons (89,4%) to the proposed therapy and only 34 patients (72,4%, Pφ<0,01) after its completion. In the comparison group indicated bronchial sensitivity to histamine was determined in 36 children (70,6%) and in 38 patients (74,6%, Pφ>0,05), respectively. The results obtained can be explained by a reduction in inflammatory component of bronchial hypersensitivity as a result of the therapy conducted [12].

It should be noted that after the treatment revealed the likely increase in risk reduction air ways hypersensitivity expression in patients who received combination therapy with Nucleinat, compared with children control group (Tabl. 2), and that changes were mainly indicators of bronchial hypersensitivity.

**Table 2**

**The risk of the respiratory tract hypersensitivity in patients of the first clinical groups on control group**

| Indicators of the bronchial hypersensitivity / Time of the examination | Risk | |
|---|---|---|
| | relative risk (95% CI) | odds ratio (95%CI) |

| | | | |
|---|---|---|---|
| $PC_{20}H$ more than 0,25 mg/ml | before treatment | 1,03 (0,8-1,2) | 1,06 (0,5-1,9) |
| | after treatment | 1,94 (0,6-2,2) | 3,13 (1,5-6,4) |
| $PD_{20}H$ more than 0,13 mg | before treatment | 0,97 (0,7-1,2) | 0,94 (0,53-1,6) |
| | after treatment | 1,60 (1,3-1,9) | 2,39 (1,2-4,7) |
| DDC less than 0,9 a.u. | before treatment | 0,47 (0,2-0,9) | 0,28 (0,1-0,6) |
| | after treatment | 1,06 (0,6-1,6) | 1,1 (0,5-2,1) |

So, children in the first clinical groups after the treatment were characterized by higher risk reduction bronchial hypersensitivity in terms of concentration of histamine provokes relatively sick placebo-controlled group. In particular, the achievement of positive change on the part of bronchial hypersensitivity in school-age children that combined anti-inflammatory therapy received Nucleinat, the relative risk was 1,9 (95% CI 1,3-9,3), the absolute risk – 0,3 with odds ratio – 3,3 (95% CI 1,7-6,1). It should be noted that under the influence of Nucleinat in the basic therapy revealed lowering of absolute risk of distinct hypersensitive airways and could see 25,8%, DRR – 54,8% (95% CI 44,5-64,8) and the minimum number of patients who should be treated to get one positive result was equal to 1,8 (95% CI 0,1-7,1).

**Conclusions**: The use of Nucleinat in the combined therapy for children's bronchial asthma ensures a significant reduction in bronchial hyperresponsiveness. The achievement of positive change on the part of bronchial hypersensitivity in school-age children that combined anti-inflammatory therapy received Nucleinat, the relative risk was 1,9 (95% CI 1,3-9,3), the absolute risk – 0,3 with odds ratio – 3,3 (95% CI 1,7-6,1). The influence of Nucleinat in the basic therapy revealed lowering of absolute risk of distinct hypersensitive airways and could see 25,8%, DRR – 54,8% (95% CI 44,5-64,8) and the minimum number of patients who should be treated to get one positive result was equal to 1,8 (95% CI 0,1-7,1)

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