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Exploring opportunities for improving adherence to treatment in adolescents with bronchial asthma

Key words: *bronchial asthma, adolescents, adherence, treatment.*

Despite the significant progress in the understanding of the nature of bronchial asthma (BA) and the implementation of clear and concise standards of treatment in 20–60 percent of the cases still, show inefficiency of basic preventive therapy. This situation is largely associated with poor patient adherence to long-term treatment [4, 11]. In the recent years, great attention was given to the elaboration of effective methods of medical tactics that would enable the implementation of active participation of the patient in the process of treatment, which led to the active application of the term «adherence» in the field of medical practice. Adherence is the term that combines the understanding, willingness and active participation of the patient in the therapeutic process [4, 7]. According to the definition of the experts of the WHO, adherence to treatment is a concept that characterizes how accurately and consistently the patient performs the physician's advice regarding the medication regimen, diet observance and lifestyle modifications [3, 4]. The studies in recent years found that the adherence level is significantly higher in patients with acute conditions than with chronic diseases. Considering the fact that BA is a chronic disease that requires long-term basic treatment, compliance with the new lifestyle, elimination of triggering factors, the issue of patients' adherence to their treatment plays a greatly important role. Current studies have shown that adherence to treatment dramatically declines in the first six months of a long-term treatment regimen. In such cases the decrease of adherence does not only lead to the progression of the disease and the occurrence of complications, but also to the limitation of the functional abilities of the body, worsening of the quality of life, and sometimes premature death [12, 13]. Because of the importance of adherence to treatment,

it is also called the «key mediator between medical practice and potential prognosis for the patient» (National Council on Patient Information and Education, 2007).

Adolescents represent an especially vulnerable category of patients with low adherence to treatment, as they show a strongly negative attitude to long-term treatment and are unwilling to look ill in front of their peers [1, 5, 12]. Despite the fact that almost all available drugs are allowed to be used in the treatment of adolescents with bronchial asthma (age limits applied for younger children were removed), the paradox is still present – it is very difficult to achieve the control of the disease. This situation is largely caused by the psychological imbalance of teenagers, as the vast majority of them have hysteroid traits of character: they show off in their statements, tone, and behavior, and often are extremely self-absorptive. They are very emotional and vulnerable, generate mixed reactions to treatment, which significantly reduces the level of cooperation between the doctor and patient. Adolescents enter adulthood but are still not able to think as adults, nor as children thus it is difficult to find common ground. Even though adolescents are not willing to admit the presence of their disease they are still emotionally experiencing deterioration in their condition during relapses of the illness and are not always looking for the support that they need in their parents, physicians, and peers. Parents often lose contact with the teenager and can not control treatment, while the cooperation with the treating physician is also worsening. At the same time, there is evidence that particularly this young group of patients is at highest risk of death during asthma attacks. [8].

The studies conducted in the recent years have shown that low adherence to treatment in patients with bronchial

asthma could be explained by the lack of awareness about the nature of their disease and the possibility of its control, the desire to avoid permanent dependence on drugs, inefficient use of inhalers, unwillingness to accept chronic aspect of the condition, etc. [6, 15]. On the contrary, the lack of monitoring of the causes of poor adherence leads to the possibilities of physicians to wrongly increase the dose of the inhaled drugs, which in its turn does not only increase the cost of treatment, but also complicates the medication regimen, increases the risk of side effects and thus lowers adherence to treatment [9, 10, 16]. However, there are still no definitive standard guidelines to evaluate patient adherence to treatment. Various clinical methods assist in resolving this issues with the help of a specially designed questionnaires and scales [2, 17]. The situation described above has identified the relevance and purpose of our study.

Purpose of the work: to increase the efficacy of treatment of adolescents with bronchial asthma with the help of the implementation of a complex program aimed to increase the adherence to treatment.

Materials and methods. The research was conducted at the Lviv City Children's allergy center of the City Community Children's Hospital. The study included 92 adolescents. Criteria for inclusion in the study were the following: age 12–18 years; diagnosed asthma (the length of which was not less than 2 years); prescribed basic asthma treatment, which is compliant with the recommendations of the protocol (Ministry of Health of Ukraine from 08.10.2013, № 868 «On approval and introduction of medical and technological documents on standardization of asthma care»); absence of disease control; low adherence of patients to prescribed treatment. The patients were observed during 6 months. During the study contact was lost with six patients, so the final analysis of the research results was conducted on 86 adolescents. Patients were assessed at the baseline and at the 1st, 3d and 6th month. Each examination included the evaluation of the symptoms of the disease using the Asthma Control Test (ACT), measuring FEV₁, as well as filling in questionnaires for adherence control, specially designed for parents and children. Each questionnaire contained eight question the aim of which was to identify the main factors influencing adherence to treatment, and to determine their role in the attitude of the child and one's parents to the disease, and their relation to the treatment. The questions were posed in such a way as to comprehensively cover the most common causes of poor adherence to treatment. Each patient was interviewed in a calm and favorable atmosphere, in order that one could realize and understand what exactly leads to rejection in taking the drug. Thus, giving answers regularly made it possible not only for adolescents to become better aware of what factors occupy the key role in revising their attitude to the disease but also for the treating physicians to receive the necessary data for treatment optimization.

When the questionnaire for parents was being created it has been aimed to cover the most common reasons that could influence parents decisions. For example, it has

been noticed that parents tend to replace the original drug with its cheaper analog because of its price. They also decreased the frequency of the regimen of medication intake, or in some cases completely stopped using the prescribed drug. Nevertheless, during each interview, parents gave their own answers to the questions and justified their position. It should be noted that after each subsequent interview, we noted that parents significantly changed their positions and began to realize what risks and dangers may arise during unauthorized modification or discontinuation of treatment. For each answer «Yes», the respondent received 1 point. Accordingly, the adherence considered to be poor if the respondent received 6–8 points, average 4–6 points, and 0–4 points were considered as high adherence to treatment.

Results of the research and discussion. The study of factors that influence patients' with bronchial asthma adherence to treatment (from the position of children and their parents) was conducted among 86 patients, 39 (45,3%) girls, and 47 (54,7%) boys. The average age of the studied patients was (14,8 ± 2,55). The selected patients showed no reservations or reluctance to participate in the study. The children were open to communication and collaboration and their parents have shown initiative and interest in reaching better control of the disease.

At the time of enrollment, the majority of patients, namely 52 (60.5%) and their families received most of the information about their illness from online editions and did not understand the nature of asthma symptoms, as well as did not understand the seriousness and the variability of symptoms and how to act to manage them.

According to the data of the questionnaire of adherence to treatment, high and average adherence was registered in 28 (32,6%) patients.

The results of the study showed that 58 (67.4%) adolescents did not understand and did not perceive the need for long-term basic treatment of asthma. It was established that most of the adolescents (59–68.6%) and their parents (65–75.6%) considered short-acting bronchodilators as essential drugs for asthma treatment, however not the drugs included in the basic treatment. They viewed asthma not from a position of chronic inflammation but from the position of attack.

It is important to mention that 35 (40.1%) children were raised in single-parent families, which was considered as one of the stress factors that can affect adherence to disease. Moreover, studies published in recent years have shown that the psychological condition of the parents and the general atmosphere in the family significantly impact the treatment of children's' asthma [1, 5]. Single-parent families are at greater risk of depression in parents into comparison with two-parent families. Furthermore, randomized studies have shown that there is a direct correlation between the need for emergency medical assistance of children in single-parent families [14, 18].

In recent years it has been proven that achieving control of asthma is largely determined by the position of the parents. Our research has shown that 29 (33.7%) parents included in the study did not trust the prescribed treatment,

independently changed the dosage, often allowed to abuse the treatment regimen. Children missed their medication when the overall health condition improved and the disease did not cause serious health-related issues. We tried to identify what encourages parents and children to such actions and found that the vast majority (54–62.8%) of parents did not understand the need for long-term treatment.

The presence of bad habits in parents and patient was also considered to be as one of the risk factors contributing to poor adherence. It should be noted that adolescence is exactly the time when children begin to experiment with different alcohol and tobacco substances, while it is known that active and passive smoking significantly affects the controllability and the emergence of asthma exacerbations. It has been established that – 18 (20.9%) of the surveyed children were active smokers, and 46 (53.5%) were subjected to passive smoking.

Considering the factors that might influence the patients' with bronchial asthma adherence to treatment from the position of physicians', we conducted a set of interviews of 9 doctors that are working in various departments of the Lviv Community Children's Hospital. The questions were posed in a way so that it could be possible to receive the most accurate information on the topic. Unauthorized stopping treatment, according to doctors, can be caused by side effects of drugs, a significant improvement of the patient's condition, unwilling to take medication, and fear of addiction to the prescribed treatment. Children of the adolescent age are often ashamed to look ill in the eyes of their peers and therefore they often stop treatment. And of course, the lack of improvement of the disease in the background of this treatment spreads disappointment and stimulates refusal of treatment.

Factors that increase the adherence of patients to treatment, according to doctors, are the apparent effectiveness of medicines, understanding of the benefits of prescribed treatment, ease of use of the medicines, severe bronchial asthma, low price of medicines, unfortunate experience of other patients who suffered from asthma, a good relationship and trust between the doctor and patient.

The major problem in achieving high adherence to treatment could be considered in the absence of effect in the use of prescribed therapy, doctors assume. However, the absence of the effect of treatment is not always possible to be explained by the poor quality of prescribed medication, self-appointed replacement of the drug by a cheaper analog or irregular reception. The results of the interviews have shown that one of the reasons of medication inefficacy could be present because of an inadequately prescribed treatment (2 doctors), an insufficient dose of the medication. One of the main reasons for the ineffectiveness of inhaled medicines, 8 doctors considered improper use an inhaler. Only one doctor named misdiagnosis as one of the reasons of ineffective treatment.

The conducted studies allowed us to systematize the main reasons of poor adherence to treatment in adolescents with bronchial asthma and we highlighted the following:

- difficulties in using the inhaler – 46 children (53,4%);

- inconvenient medication intake regimen (3–4 times per day) – 32 children (37,2%);
- medication side effects – 7 children (8,1%);
- fear of side effects of the medication – 32 (37,2%);
- the cost of the medication – 40 children (46,5%);
- lack of patient awareness – 69 (80,2%);
- upbringing in a single-parent family – 35 (40,6%);
- poor compliance with the treating physician – 26 (30,2%);
- underestimation of the severity of the condition – 34 (39.5%);
- underestimation of the severity of indifference on his health (teenage negativism) – 54 (62.7%);
- lack of quality monitoring of the progress of the disease – 31 (36.04%).

Considering the presented data we have developed a special program aiming at the increase of adherence to treatment that foresaw:

- awareness of the patient about one's disease (individual interviews);
- clear and presented in writing specific instructions for basic treatment algorithm and actions at the time of asthma attacks;
- clear system of monitoring the progress of disease control and assessment of its calculation of risk of a relapse.

Thus, having this in mind we focused more attention on writing down the action plan depending on the situations that might occur. This plan was developed individually during each hospital visit. We did not ask the adolescents to keep a self-assessment diary because it immediately caused rejection. Therefore, we kindly asked the parents to carefully control the treatment process.

Adherence to asthma treatment is inextricably linked with the skills to effectively use inhalation device. A key element in optimizing treatment was the reduction of errors that patients commit during inhalation. The way to address this issue was to study the possibility of supply of medicines in a single type of inhaler. We tried to select the most convenient inhalation device for each patient, considering the abilities of the patient, and the cost of the drug.

During each physician visit, the patient underwent specific individual education, evaluated the control of asthma, current treatment, and quality of life. In addition, each patient was determined in the terms of risks of relapse, and side effects of the drug. Assessment of current treatment included the analysis of the adequacy of prescribed therapy, the correct inhalation technique, and adherence to treatment.

One of the main objectives of the comprehensive program was to find comorbid conditions in each patient and the relevant medical recommendations for their control.

Considering the presented data, as well as long-term work with patients we have developed educational and informational material in the form of a manual «My asthma and me,» which was given to each of our patients.

Individual educational work with patients and their families contributed to a significant improvement of adherence to treatment. This is confirmed not only by the analysis

of a special questionnaire but also by the indicators of the Asthma Control Test and spirometric examination.

Dynamic analysis of the survey results has allowed us to establish that according to the data of the questionnaire at baseline, the average and high adherence to treatment was recorded in 28 adolescents (32.5%), after 3 months – in 49 (56.9%) and at the end of the 6 month – 75 (87.2%) patients. Studies have shown that children from single-parent families are more challenged in achieving high indexes of adherence to treatment.

Bronchial asthma evaluation based on the ACT results has shown low results at the start of the research, as asthma control was reached in 49 children (56.9%) whereas, in the end of the 6 months, asthma control was reached in 72 (83.7%) children. At the start of the study the average FEV1 was 58.9%, increased to 65.3% during the 3 months, and at the end of the research was 69.1%, accordingly.

The implementation of a comprehensive program made it possible to achieve not only better asthma control within 6 months of treatment and improve the FEV1 performance, but also reduce the pharmacological load in 23 (26.7%) adolescents (IGCC reduce the dosage and prolonged bronchodilators).

Significantly better performance FEV1 showed that increasing adherence to treatment has a critical impact on the course of symptoms of asthma, as well as the ability to control the disease, which is reflected in the dynamics of improvement of the functional capacity of the lungs.

Throughout the whole research process, it was important to establish trust between the doctor, parents and the patients, so that the process of treatment could be considered as an algorithm of executed command actions. The establishment of trust between parents and the attending physician was especially important because often the parents influence the final decision on adolescents confidence in one's doctor and one's adherence to prescribed treatment. At the start of the study, the use of Internet resources and their credibility were registered in 52 parents of adolescents (60.4%), while scientific medical literature was read only by 10 (11.6%) of them, while the physician's advice

was taken as authority only in 24 (28%) parents. After 3 months, the results changed, the advice of the doctor was preferred by 37.2% of parents. At the end of the study, the popularity and credibility of online publications and the opinion of the treating physician became almost equal and amounted to 43.02% and 40.6% respectively, however parents' commitment to scientific and popular literature remained virtually unchanged and registered only in 16.2% of parents.

Thus, we can conclude that online publications and the latest technologic advancements significantly affect the decision on further treatment of patients, especially in terms of their parents. However, through establishing a personal relationship with patients and creating an atmosphere of trust and responsibility, we can achieve crucially important changes in the right perception and search the right information about their illness.

Conclusions

The reasons for poor adherence to treatment of bronchial asthma in adolescents are the lack of understanding of the needs of long-term basic treatment and the altered perception of the treatment approaches, fear of side effects of drugs, and inadequate monitoring of the disease. The situation only worsens because of the complexity of the prescribed therapy regime and the difficulties associated with the use of the inhalation device.

Psychological imbalance of adolescents, show off in expressions, intonations, and behavior, and self-absorption provoke conflicts with parents, as well as mixed reactions to treatment and reduces the level of cooperation with the attending physician.

Adherence to treatment of adolescents also reduces when the psychological climate in the family is worsening (upbringing in single-parent families).

The utilization of the comprehensive program allows to better results in asthma controllability, FEV1 performance and to improve adherence to treatment, which provided the opportunity to reduce the pharmacological load in 23 (26.7%) adolescents, only during the 6 months study period.

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