

ORIGINAL ARTICLE

MULTIDISCIPLINARY APPROACH TO MANAGEMENT OF PEDIATRIC PATIENTS WITH SKIN SYMPTOMS OF FOOD ALLERGY

DOI: 10.36740/WLek202201104

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ABSTRACT

The aim: To determine the significance of multidisciplinary approach to management of pediatric patients with skin symptoms of food allergy.

Materials and methods: The study included of 36 patients aged 4 to 6 years with skin manifestations of food allergy, of which 18 were randomly included in the study group and had a multidisciplinary approach to treatment and the other 18 patients constituted a comparison group and used a standard therapy regimen. Observation of children was carried out for 3 months.

Results: Assessment of the severity of the cutaneous form of food allergy by SCORAD score showed the average degree of disease activity in the groups of the study at the beginning of treatment and significantly better dynamics in patients of the study group ($p=0.0055$). In 88.9% ($n=16$) of patients in the study group and 61.1% ($n=11$) of the control group, the process became mild.

Conclusions: The application of a multidisciplinary approach allows the integrated implementation of medical, nutritional, and psychological aspects, which significantly increases the effectiveness of treatment and improves the quality of life of patients and their parents.

KEY WORDS: food allergy, atopic dermatitis, treatment, children

Wiad Lek. 2022;75(1 p.1):20-26

INTRODUCTION

To date, various manifestations of allergic reactions and diseases are registered in 15-35% of the population according to the World Health Organization, and in recent years there has been a constant tendency to increase [1]. The first sign of allergic pathology in children, as a rule, is a food allergy, which is mainly manifested by atopic dermatitis. According to official statistics, the rate of atopic dermatitis in Ukraine is known to range from 3 to 10 per 1000 children [2]. However, the results obtained in some regions of our country according to studies under the standardized international program ISAAC (International Study of Asthma and Allergies in Childhood), exceed the above figures by 5-10 times [3]. This situation can be explained by the presence of terminological differences in the interpretation of atopic dermatitis in children, different methodological approaches to statistical research, clinical and age-related polymorphism of the disease. The development of atopic march can begin with a food allergy, so all efforts of physicians should be directed to prevent the transformation of skin forms into respiratory ones and provide the patient and his/her parents with a full quality of life [4,5].

The "School of Atopy" operates under the auspices of the MNPE "Lviv City Children's Clinical Hospital" and the Lviv City Children's Allergological Center, where a model of a

multidisciplinary approach to the management of patients with food allergies according to European standards was reproduced. Every patient treated for food allergies goes from diagnosis to treatment. Of course, great emphasis is placed on preventing and predicting the development of atopic march in children and improving the quality of life of patients and their parents.

THE AIM

The aim of the study was to determine the significance of multidisciplinary approach to management of pediatric patients with skin symptoms of food allergy.

MATERIALS AND METHODS

The study included 36 patients aged 4 to 6 years with skin manifestations of food allergies. Criteria for inclusion in the study were: food allergy with cutaneous manifestations of mild and moderate course, duration of the medical history of at least 3 months. Two groups, identical in age, sex, and severity of the disease, were formed by the randomization method. The exclusion criteria were deterioration and the need for antihistamines for more than 5 days. Observation of children was carried out for 3 months and included 4

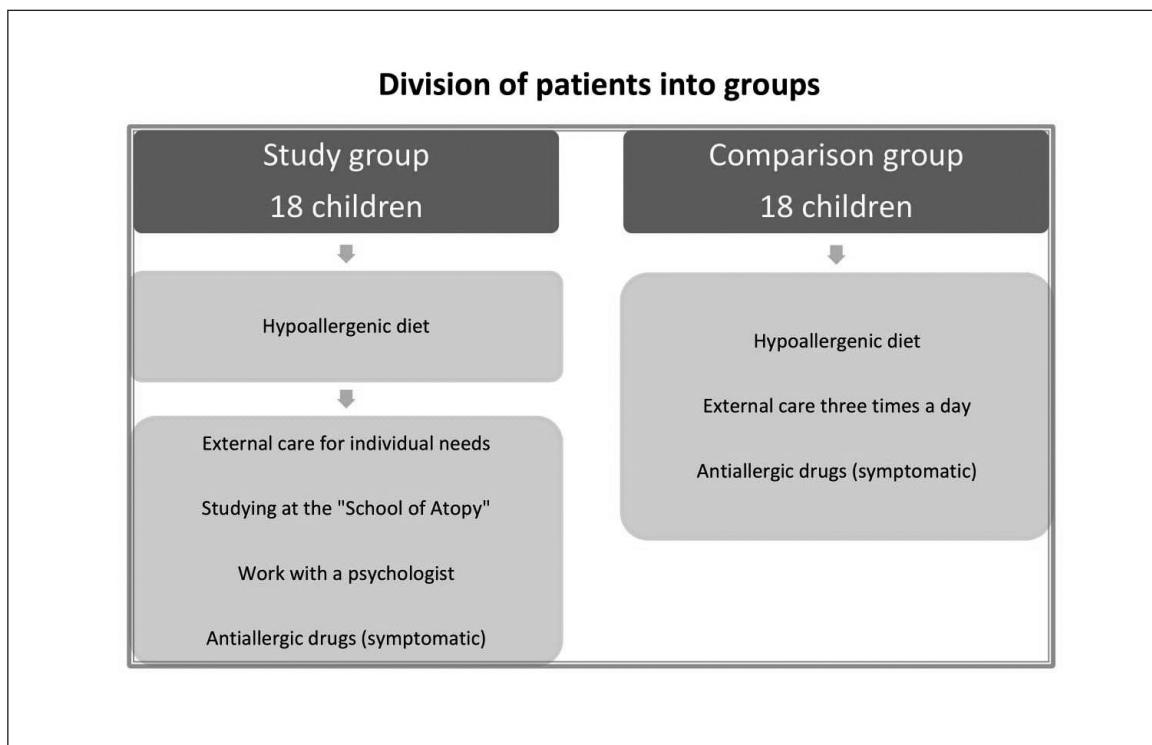


Fig. 1. Division of patients into groups

visits to the clinic – at the stage of inclusion and after 4 weeks, 8 weeks, 12 weeks in the course.

The study group included 18 patients who attended the school of atopy, kept to a hypoallergenic diet (elimination of “causal” allergens), external therapy with a moisturizing agent for individual needs, support from a nutritionist and a psychologist.

The comparison group included 18 patients who kept to a hypoallergenic diet and external therapy with a moisturizing agent with a fixed rate – three times a day and antihistamines, if necessary. Consultations and observations by additional specialists were not conducted in this group.

The division of patients into groups was performed by random sampling and is shown in Figure 1.

The multidisciplinary approach was to implement medical, nutritional, and psychological aspects.

Desloratadine was used to relieve allergy symptoms as the situation arises.

MEDICAL ASPECTS

Medical aspects were discussed with all patients in the study group in four lessons within the “School of Atopy”. Each lesson lasted up to 30 minutes, in which an allergist conducted a mini-lecture for 7-10 minutes and practical issues were discussed for 10-20 minutes. The purpose of the lessons was to inform patients about the cause of food allergies, the occurrence of symptoms, and the need for treatment. This knowledge enables a better understanding of the causes of disease exacerbation, which in many cases enables the prevention of subsequent episodes, or

when they occur, to help the doctor find out the cause and eliminate the problem faster.

The first lesson provided general information on the problem of food allergies (definition, mechanisms of development, and methods of diagnosis) [6]. Basic issues were discussed with parents in plain language. The main message of this meeting was to find the cause of the disease and record the main symptoms in writing. Such information is crucial for the doctor and can significantly reduce the time to collect medical history in the clinic. At the meeting, patients received printed forms for keeping a food diary and analysed several illustrative examples of its use (Tab. I), and later the doctor analysed the nutritional aspects [7, 8].

Much attention was paid to food additives and their impact on the child’s body (marked with the index “E” in the digital classification system), the use of which is under constant control of national and international organizations that ensure the reliability of food safety.

The second lesson discussed the influence of environmental factors (allergens, climate, chemical, and physical factors) and other possible initiating agents of exacerbation. Household allergens are a common cause of allergic reactions. Household allergens: house dust, book dust, daphnia. Epidermal allergens: fur, down, feathers, dandruff, faeces, pet saliva, human epidermis [3].

The need for regular cleaning of the apartment and more frequent ventilation, especially in the room where the child spends most of the time was emphasized.

The third lesson discussed the need and features of skin care. This information is important because the skin has several anatomical and physiological features, depending

Table I. An example of keeping a food diary and recording the development of disease symptoms

Day 1					
Time of the day	Meal (list all ingredients)	The amount of food consumed	Changes in the child's health (describe symptoms in detail and record the time of their occurrence)	Medications used	Special notes (Can the occurrence of the symptoms be associated with additional factors)
Breakfast at 8.30 am	Pear-flavored puree produced by "X"	5 tablespoons	Body rash, itching 30 minutes after consuming the product (9.00 am)	Suprastin - ½ tab. (9.20 am), activated carbon - 1 tab. (11.00 am)	Acute respiratory viral infection (day 1 of the disease), use of paracetamol in syrup 5 ml (7.15 am)
II breakfast					
Lunch					
Nooning					
Supper					

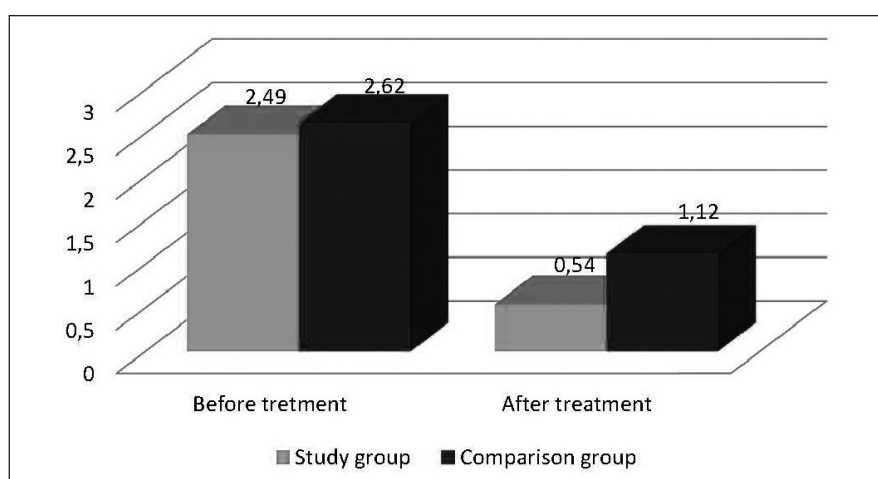


Fig. 2. Assessment of quality of life in the groups of the study (points)

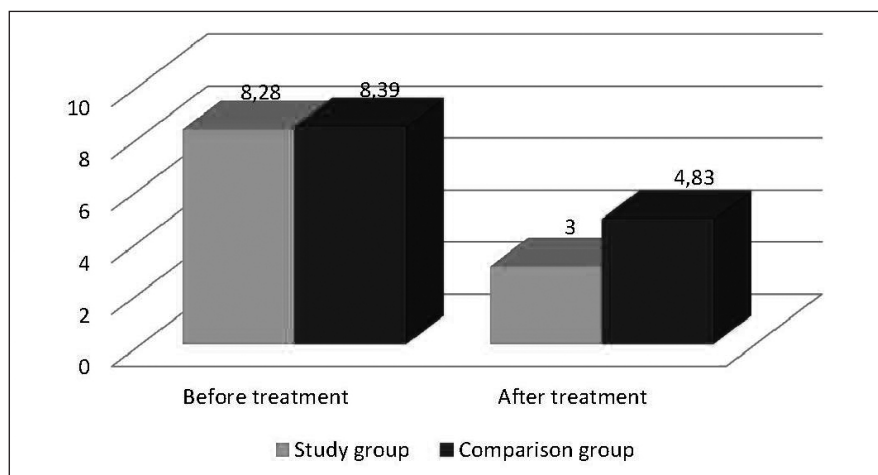


Fig. 3. Changes over time in itching in the groups under study (points)

on age, season, fluid intake, disease manifestations [9, 10]. The key point of this lesson is the application of our method of determination of the individual need and rate of external care with moisturizers [11]. Touching the proposed samples of fabrics, the patient or his parents daily determine the need and frequency of application of the emollient at home:

- satin silk – fabric is thin, light, elastic, silky, and smooth; corresponds to well-moisturized skin, apply the external medium, if necessary - once;

- suit fabric “Nicole” – fabric with linen weave, elastic, dense; corresponds to the skin that needs more thorough hydration, moisturizing 2-3 times a day;
- chiffon crepe – light fabric with a grainy texture; dry skin, frequent hydration - 4-5 times a day;
- “shine” – textured, elastic fabric, strongly rough to the touch; the skin is very dry, needs moisturizing 6 or more times a day.

Patients in the comparison group evaluated skin hydration by the rating scale without using samples of fabrics and applied the emollient three times a day:

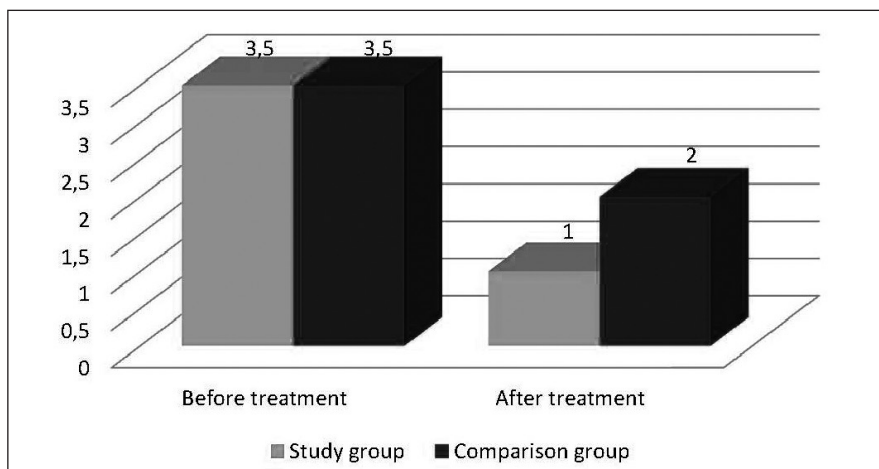


Fig. 4. Changes over time in sleep in the groups of the study (points)

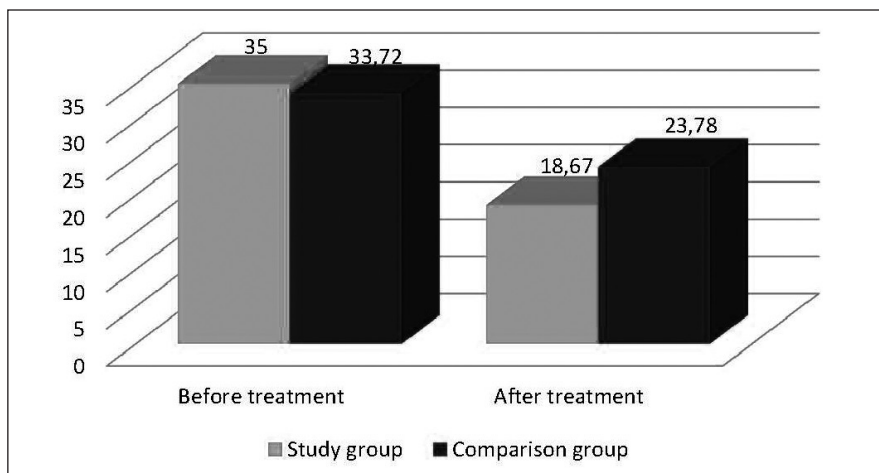


Fig. 5. Changes over time in the SCORAD index in the groups of the study

- well-moisturized skin (1 point);
- moderately moisturized skin (2 points);
- dry skin (3 points);
- very dry skin (4 points).

According to the moisture content of the skin, we can talk about the control of atopic dermatitis.

The fourth lesson analyzed the principles of treatment (indications for medications, exacerbations) and the active participation of parents in therapy for a better therapeutic effect. At this stage, treatment options were discussed – exacerbation and remission.

Parents of patients received a questionnaire to assess the quality of life in food allergies (a form for parents of children aged 0 to 12 years), which is an important criterion for the effectiveness of treatment. The questionnaire for parents with children aged 4 to 6 contains 26 questions. Each criterion was evaluated by a seven-point scale – from 0 to 6, where 0 – does not affect, 1 – barely affects, 2 – slightly, 3 – considerably, 4 – significantly, 5 – very strongly, 6 – extremely. The questions grouped information about three components – emotional impact; concerns connected with food consumption; social and dietary restrictions. The points in each area were summed up and divided into three [4, 12]. The results of the assessment of the quality of life over time became a criterion for the success of treatment.

PSYCHOLOGICAL ASPECTS

The most common complaint that came during a visit to a psychologist was itching and the disturbed sleep of the child and his/her parents. Itching is a specific sensation for the skin (and mucous membranes located close to it), which physiologically acts as a signal-warning system against tickling, scratching up to the threshold pain. The psychologist assessed the itching comprehensively, depending on the main characteristics: generalized – localized; continuous – paroxysmal; progressive – fading; depending on additional factors – temperature, situation, time of day [13].

During the psychologist’s visit, a conversation was held with children and parents. Independently developing a given subject of the plot, the child revealed his/her inner world, talked about feelings, emotions (fears, concerns), dreams, and sought a way out of any situation. Eventually, it helped get rid of negative thoughts and feel optimistic about the future – to believe in a speedy recovery [14].

Important components of disease control are the absence of itching and good sleep quality, which were assessed by parents on a visual analogue scale.

The intensity of itching was estimated from 0 to 10, where 0 – absent, 10 – very pronounced.

Sleep quality – from 0 to 10, where 0 – very strong sleep, no waking up; 10 - the child did not sleep at all.

The method of assessing the manifestations and severity of atopic dermatitis on the SCORAD scale is standard and

Table II. Types of food allergies in children

Target Organ	Symptoms	Nosology
Skin	Rash Swelling (lips, eyelids)	Urticaria angioneurotic oedema (Quincke's oedema) Atopic dermatitis Oral allergic syndrome
Digestive tract	Dysphagia, vomiting, regurgitation Constipation, diarrhoea Colic, abdominal pain Refusal to eat, rapid satiety	Eosinophilic esophagitis Gastritis, gastroenteritis Colic Food protein-induced enterocolitis syndrome
Respiratory tract	Cough Rhinitis Wheezing	Bronchial asthma Allergic rhinitis
Systemic manifestations	Anaphylaxis Shock-like symptoms	Anaphylactic shock Food-dependent cofactor-induced anaphylaxis

Table III. Aspects of monitoring patients with food allergies

Medical aspects	Nutritional aspects	Psychological aspects
Basic information (definition, epidemiology, pathophysiological mechanisms, diagnostic tests)	General recommendations for nutrition (balanced diet, diet according to age)	Stress (training on relaxation, elimination of sleep problems in parents and children)
Skin care (skin function, care recommendations)	Risk of alternative diets (diet without taking into account individual features, depleted without proper replacement)	Itching and scratching (there is a vicious circle that needs to be broken to reduce the psychological tension)
Environmental factors (allergens, climate, chemical, and physical triggers)	Different diets (preventive, diagnostic, therapeutic)	Acceptance of the disease by the child (positive perception and hope for a speedy recovery)
Treatment (indications, exacerbation)	Components of food allergy diagnosis (double-blind placebo-controlled trial)	Acceptance of the disease by the child's family (have realistic plans, increase motivation in treatment)

includes a comprehensive assessment of the prevalence of skin manifestations and their intensity (the assessment was performed by a physician) [5, 15]. It enables us to summarize the effectiveness of an integrated approach in the treatment of the child.

RESULTS

The study involved 36 children. The description of the studied cohort of children by age showed the following distribution: the median of the study group was 5.00 years [4.00; 6.00], comparison groups - 4.50 years [4.00; 5.00] ($p=0.5966$). Gender distribution: in the study group there were 44.4% of boys and in the comparison group 55.6% ($p=0.7389$).

DATA ANALYSIS OF THE FIRST LESSON

The analysis of the food diary revealed the connection of a certain product with the development of exacerbation of the disease in 33.6% ($n=6$) of patients in the study group and 38.9% ($n=7$) of the comparison group ($p=1$).

In particular, the main causes were milk, eggs, fish, nuts, honey. Previously, when obtaining medical history, parents did not specify the above products, but they were included in the diet.

27.8% ($n=5$) children of the study group and 16.7% ($n=3$) of the comparison group consumed juices and sweets with fillers ($p=0.6906$).

Experience shows that sometimes children consume food not controlled by their parents (in preschool, school, on a visit). It is helpful to record the child's entire diet in writing to find the relation to the causative allergen. The need to record a menu during the day is very disciplining for patients' parents.

DATA ANALYSIS OF THE SECOND LESSON

Analysing the living conditions at the beginning of the study, we found that 22.4% ($n=4$) of patients in the study group and 27.8% ($n=5$) have a source of dampness in the room ($p=1$).

In 61.1% ($n=11$) of the study group and 66.7% ($n=12$) of the comparison group, feather and down items were eliminated ($p=1$).

There were pets in 27.8% ($n=5$) of the study group and 11.1% ($n=2$) of the comparison group ($p=0.4018$). In the study group, cats, dogs, and parrots lived with the child in the house. There were cats and hamsters in the comparison group.

DATA ANALYSIS OF THE THIRD LESSON

External skin care was studied. Individual determination of the need and frequency of external care by moisturizers in the study group and a specified need three times a day in the comparison group.

Skin moisturizing at the beginning of treatment in both groups was 3 points ($p=0.8296$), which corresponds to dry skin. Patients in the study group made the tactile comparison of the skin with the chiffon crepe fabric – a light fabric with a grainy texture and moisturized the skin more often – 4-5 times a day. Patients in the comparison group evaluated skin hydration but received the emollient steadily three times a day. The results of the study showed that significantly better changes in the skin hydration were in the study group after treatment ($p=0.0009$) and there was a tactile resemblance of skin to the satin silk fabric – a thin, light, elastic, silky, and smooth fabric.

DATA ANALYSIS OF THE FOURTH LESSON

Patients' parents received a questionnaire to assess the quality of life in food allergies (form for parents of children aged 0 – 12 years) and evaluated twice - at the beginning and end of treatment.

The quality of life indicators in both groups showed that the manifestations of the disease affect the lives of children slightly – significantly at the beginning of treatment ($p=0.4187$). The results of the assessment of the quality of life over time showed successful results in the study group, which managed to reach the level of the disease that has *no effect* – *barely affects* it, while in the comparison group there was also an improvement in the level that *barely affects* it.

ANALYSIS OF PSYCHOLOGICAL ASPECTS

All patients in the study group appreciated the effectiveness and importance of the psychologist's work. Thanks to a conversation with a psychologist, all parents were able to find compromises in nutrition and the right approach to the child.

Figures 3 - 5 show the changes over time in itching, sleep, and evaluation on the SCORAD scale in the groups under study.

The intensity of itching did not differ at the beginning of treatment in the compared groups and had significantly better changes over time in the study group at the end of the observation ($p=0.0015$).

Before treatment, parents in both groups equally assessed a significant sleep disturbance of children (3.5 points), but at the end of treatment in the study group had better changes over time ($p=0.0011$).

Assessment of the severity of the cutaneous form of food allergy on the SCORAD scale showed the average degree of disease activity in the groups of the study at the beginning of treatment and significantly better changes over time in patients of the study group ($p=0.0055$). The process became mild in 88.9% ($n=16$) of patients in the study group and 61.1% ($n=11$) of the comparison group.

Children in the study and comparison groups received Desloratadine for symptomatic treatment during 1-5 days in 33.3% ($n=6$) and 38.9% ($n=7$) cases.

DISCUSSION

Food allergies can affect various target organs, including the skin, digestive tract, respiratory tract, or develop systemic manifestations (Tab. II).

In Ukraine, there is no clear sequence in the management of patients with food allergies by a specific specialist. That is why they are scattered among doctors of different specialties, which mainly depends on the nature of the symptoms. Primary care physicians, dermatologists, allergists, most often treat skin forms of food allergy. The occurrence of gastrointestinal symptoms leads patients to gastroenterologists, infectious disease specialists, surgeons. Respiratory symptoms are eliminated by paediatricians, family doctors, pulmonologists, allergists. In this situation, it is difficult to calculate the prevalence of food allergies. Besides, paediatric patients with symptoms of food allergies often seek medical attention to eliminate somatic complaints, prescribe an appropriate diet and medications.

Various aspects of monitoring of patients with food allergies and their characteristics are presented in Tab. III [3].

In developed countries, there is a multidisciplinary approach to the management of patients with food allergies, which is to adhere to medical, nutritional, and psychological aspects. The management of such patients is carried out in cooperation with specialists of various related specialties – paediatrician, dermatologist, psychologist, nutritionist, and paramedics [1].

We are providing multidisciplinary approach to the management of patients with food allergies in local area and this complex therapy has to be recommended in all hospitals in Ukraine.

CONCLUSIONS

Summarizing the analysed information, we can conclude that training is an important component of treatment success. When the patient or his/her parents know what causes the exacerbation and how to behave in a particular situation, the disease can be ceased much faster. There are different types of programs that include individual or group classes. It is believed that individual classes do not require funds, technical equipment, but each visit some time is spent to discuss various issues. Electronic resources are becoming more and more popular, where the patient can study a topic that interests him/her at a convenient time. Thus, training can be organized in any way, mainly to benefit the patient and his / her family. A comprehensive multidisciplinary approach to patient management is already our current priority, which must be developed and implemented in daily medical practice.

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Conflict of interest:

The Authors declare no conflict of interest.

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Received: 05.11.2020

Accepted: 15.08.2021

A – Work concept and design, **B** – Data collection and analysis, **C** – Responsibility for statistical analysis,

D – Writing the article, **E** – Critical review, **F** – Final approval of the article



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