

**I. L. ARSENTYEVA, E. A. DOTSENKO,
N. L. ARSENTYEVA**

**SYMPTOMS, DIAGNOSIS, PRINCIPLES
OF TREATMENT AND PREVENTION
OF ACUTE ALLERGIC DISEASES**

Minsk BSMU 2021

МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ
БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ УНИВЕРСИТЕТ
КАФЕДРА ПРОПЕДЕВТИКИ ВНУТРЕННИХ БОЛЕЗНЕЙ

И. Л. АРСЕНТЬЕВА, Э. А. ДОЦЕНКО, Н. Л. АРСЕНТЬЕВА

**СИМПТОМАТОЛОГИЯ, ДИАГНОСТИКА,
ПРИНЦИПЫ ЛЕЧЕНИЯ И ПРОФИЛАКТИКИ
ОСТРЫХ АЛЛЕРГИЧЕСКИХ ЗАБОЛЕВАНИЙ**

**SYMPTOMS, DIAGNOSIS, PRINCIPLES
OF TREATMENT AND PREVENTION
OF ACUTE ALLERGIC DISEASES**

Учебно-методическое пособие



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Аллергические заболевания являются одной из актуальных проблем в клинической медицине. Представлены современные принципы клиники, диагностики, лечения и профилактики острой аллергической патологии.

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LIST OF ABBREVIATIONS

- AA — acute anaphylaxis
AAE — acquired angioedema
HAE — hereditary angioedema
HCG — household chemical goods
Ig — immunoglobulin
IM — intramuscularly
IV — intravenously
MA — medication allergy
SAS — surface active substances

MOTIVATIONAL CHARACTERISTIC OF THEME

Annually there is an increase in the number of allergic diseases events all over the world. This pathology can develop any age.

The house dust, wool of animals, medicines, hexapods (especially Hymenoptera), pollen of plants during blooming, household chemicals, food stuffs, a mould fungi, and also cosmetics can be allergens.

Allergic diseases are one of the most complicated problems of modern medicine. This is due to the high prevalence of the yielded pathology, with morbidity mainly at able-bodied age, with a high frequency of idiopathic forms (50 % of acute urticaria cases), the expressed depression of quality of life of patients and frequent unsuccessfulness of diagnostic and medical measures at this pathology.

Treatment of patients with acute allergic diseases frequently requires punctuality in the organization of medical process, specific discipline in patient's behavior, close cooperation between the doctor and the patient. In persons, suffering from any allergic pathology, the quality of life is seriously impaired: asthma attacks, rhinitis, a dacryagogue, skin itching can influence daily activity, disrupt sleep, rashes on open areas of the body constrain the patient, reduce a self-esteem, sharply limit leisure, interpersonal communication and professional activities.

The basic measures for prophylaxis of any allergic pathology include making of a hypoallergenic lifestyle and following a diet excluding causally significant allergens.

Undesirable responses to medicines are a serious problem for the physician. Body's reactions to medicines are extremely varied. The nature of medicines side effect is intricate and interdependent upon diverse structure of medicines and as well as with the body reactivity. With a high frequency of medicine

complications (up to 30 % of the number of hospitalized patients), and amount of medication allergy itself is on average about 10 %. Therefore, it is very important to be able to make a correct diagnosis, to distinguish allergic complications from non-allergic ones and not to refuse patients in treatment when it is possible just to change the dose, method of administration or combination of medicines.

Clinical features, diagnosis and treatment of allergic diseases are largely caused by the pathogenetic mechanism of their development (B-dependent allergic reactions, antibody-dependent, and T-dependent (reaction of cellular type). In turn, B-dependent reactions are A-globulin caused by secretory globulin A (with clinical form like allergic rhinitis or bronchitis); G-globulin (with clinical form like serum disease, cytotoxic reactions), E-globulin (with clinical form like anaphylaxis, pollinosis, urticaria). T-dependent allergic reactions are of the tuberculin type, contact dermatitis type and transplant rejection reactions.

Allergen classification:

1. Infectious allergens (bacterial, fungal, viral).
2. Not infectious (food, pollen, household (Fig. 1), medicinal, chemical).



Figure 1. House dust mites (E. A. Dotsenko, MD, Professor of Medicine, BSMU, 2021)

URTICARIA

Urticaria is the heterogeneous group of diseases characterised by appearance of skin rash and itching when the primary skin rash element is the bleb and / or is more rarely — a papule. The Feature of urticaria is the rapid onset of blebs and their rapid resolution within 24 hours without the formation of secondary cells.

The bleb is a localized dermal edema in diameter from several millimeters to several centimeters, peripheral hyperemia on and with more pale central part. It is an element towering over a surface of the skin, turns pale at pressure, is accompanied by itching and completely disappears within days. The major characteristic of urticaria is uniformity, i.e. the dermal eruption is presented by one morphological bleb.

Urticaria is widespread disease: from 15 to 25 % of the world`s population has urticaria at least ones in their lives. Acute urticaria accounts 70–75 % of cases, occurs more often at young people of both sexes, mainly with atopic constitution. Disease debut is occurs in the 2nd, 3rd or 4th decades of life. In 49 % of patients a combination of urticaria and Quincke's edema is observed, in 40 % of patients there is only urticaria, and 11 % has Quincke's edema. Hereditary complement-dependent edema occurs rare (2 % of all cases of Quincke's edemas).

The basic etiological factors of acute spontaneous urticaria are food and medicines. Acute urticaria is also possible in patients with a latex allergy and when eating some food products (bananas, kiwi, yellow apples, potatoes, apples, eggs, crabs, etc.) due to the two-dimensional allergic responses known as “a fruit-latex syndrome”.

Urticaria develops probably in case of allergies to epidermal allergens (a cat, a dog), to house dust mites (see Fig. 1), and pollen allergens, to poison of Hymenoptera (bees, wasps).

Clinical features of urticarial. In urticaria any localization of skin rashes with itching is possible. It includes a hairy part of the head, a palm and foot, as well as a lesion of the mucosa: the oral cavity, larynx, esophagus. The size of rashes varies from several millimeters to several centimeters. Formation of confluent elements with figured outlines (huge urticaria) is possible. In acute urticaria large generalised rashes are normally observed which develop rapidly and resolve quickly (Fig. 2, 3).

Acute urticaria lasts less than 6 weeks. It can be continuous (daily rashes) and periodic (absence of symptoms from 6 weeks to about several months).

The most frequent causes of spontaneous urticaria are infections — viral hepatitis, gastritis caused by *Helicobacter pylori*, staphylococcal and streptococcal infections, physical urticaria: cold variant, a time-delayed urticaria from pressure, thermal, solar, demographic one, vibratory urticaria / edema. Special types of urticaria: aquagenic, cholinergic, contact and also caused by physical effort.

Urticaria classification. Acute urticaria — less than 6 weeks:

1. Continuous — daily.
2. Periodic — absence of symptoms from 6 weeks about several months.



Figure 2. Urticaria (Fitzpatrick's Color Atlas & Synopsis of Clinical Dermatology / K. Wolff, R. A. Johnson, D. Suurmond. The McGraw-Hill Companies, 2005)



Figure 3. Urticaria (Fitzpatrick's Color Atlas & Synopsis of Clinical Dermatology / K. Wolff, R. A. Johnson, D. Suurmond. The McGraw-Hill Companies, 2005)

Characteristics of main types of urticarial:

1. The Allergic urticaria:

- relationship of cause and effect with allergen;
- rapid disappearance of symptoms after antihistamine treatment;
- recurs in a repeated contact with allergens;
- widespread urticaria can be an anaphylaxis symptom;
- risk groups: young persons, people with atopic phenotype;
- cross sensitivity is a characteristic feature of the contact with related allergens.

2. *Dermografic urticaria* (about 5 % of the population):

- more often at young age patients;
- accompanies diseases with an asthenoneurotic syndrome;
- itching after shaped irritation of the skin disappears within 30–60 minutes;
- the provocative test: a mechanical stimulation by a blunt object;
- high efficacy in antihistamine treatment (up to 96 % of patients).

3. *Cold urticaria* (not less than 3 % among all physical urticarias):

– it is provoked by low environment temperatures, by relative changes of air temperature (with wind, cold beverages, etc.);

– systemic reactions up to an anaphylaxis are possible when bathing in natural bodies of water;

– the test with an ice cube is used for diagnosis;

– secondary cold urticaria is started in infectious, autoimmune limfoproliferative, and parasitic diseases;

– cryoglobulin level test is indicated in case of secondary cold urticaria.

4. *Cholinergic urticaria* (15–34 % of patients with special types of urticaria):

– it more often occurs in young men and persons with atopic constitution;

– typical triggers are physical exercises, hot bath/ shower, stress, emotions, hot beverages, a spicy food;

– the next systemic reactions are possible: hypotension, collapse, bronchospasm, gastrointestinal symptoms;

– it is diagnosed by means of provocative tests: physical exertion, a hot bath;

– it is diagnosed by means of provocative tests: at an exercise stress, a hot bathroom.

Principles of urticaria treatment:

1. Elimination of causally-significant allergens,

2. Following the drinking regimen (not less than 30–40 ml of water per 1 kg of body mass per day).

3. Considering participation of Histaminum in the formation of all urticaria symptoms, antihistamine medicines of the 2nd generation (Parlazin, Zirtek, Kestin, Erius, etc.) are select medicines. Besides their direct antihistamine activity action, they have anti-inflammatory activity.

4. Enterosorbents (activated (absorbent) carbon, Polyphepanum, Enterosgel etc.).

5. If these drugs are ineffective, use other drugs: Peritolium, Ketotifenum, Montelukast. In cholinergic urticarial it is possible to use cholinolytics.

6. If there is no efficiency: a tolerance induction. (In *cholinergic urticaria* tolerance induction is carried out through physical activity).

QUINCKE'S EDEMA

Quincke's edema, also known as angioneurotic edema, is an acute allergic disease characterised by edema of the skin and also hypodermic fat tissue, as well as mucosas of various organs and systems (respiratory, alimentary, urinary, nervous, etc.) and skin itching (Fig. 4).



Figure 4. Quincke's edema (E. A. Dotsenko, MD, Professor of Medicine, BSMU, 2021)

Classification of Quincke's edema:

1. Acute Quincke's edema.
2. Acute recurrent Quincke's edema (3 and more episodes within 3–6 months).

Clinical features of Quincke's edema:

- sudden severe edema of dermal sublayers and hypodermic fat tissue;
- it is seldom accompanied by an itch, much more often — a burning sensation or painfulness;
- frequent lesion of mucosas;
- it takes more than 24 hours (up to 72 h) edema to disappear, i. e. the Quincke's edema disappear more slowly than the resolution of blebs;
- edema is often asymmetric;
- light pink or ordinary skin colour;

– typical localisation is hydrophilic tissues: face (periorbital areas, lips, the hairy part of the head, oral cavity (tongue), pharynx, genitalia, palms, dorsal surface of feet, but in general, an edema can have any localization.

Simultaneously with dermal manifestations there may be edemas of joints, mucosas, including larynxes, pharynx and gastrointestinal tract.

Larynx edema is a life-threatening condition. The clinical features manifestations are: cough, husky voices, asthma attack, stridor respiration and also death from asphyxia is possible.

Edema of gastrointestinal tract mucosa is accompanied by an intestinal colic, nausea, vomiting. Lesion of any parts of a gastrointestinal tract is possible.

Cases of brain and myocardium Quincke's edema are described.

HEREDITARY ANGIOEDEMA

Hereditary angioedema (HAE) is an autosomal-dominant disease characterized by episodic angioedema of any area of body. The cause of the disease is a decrease in the protein function inhibiting S₁-esterase that leads to uncontrolled activation of the classical way of a complement activation and bradikinin stage. The onset of the disease usually occurs under the age of 20, but in many patients the disease is not recognized for decades. It is necessary to examine close relatives of the patient, since persons with an unidentified diagnosis of HAE are at risk of death in 35 % of cases. HAE is suspected in each patient with a recurrent angioedema or abdominal pain syndrome when a reduced amount of s₄-fraction of a complement in blood serum is detected. At datum level of S₄-fraction the probability of the absence of HAE in the patient is 96 % and, as a rule, there is no necessity for further diagnosis.

Acquired angioedema (AAE) occurs in older people, is frequently associated with lymphoproliferative diseases, presence of antibodies to s₁-inhibitor or with persistent chronic infection. If AAE is suspected it is necessary to search for possible lymphoproliferative diseases, systemic Lupus Erythematosus, hepatitis or other infections. For AAE, unlike HAE, a low level of C₁-fractions of complement is usual.

Clinical features of HAE. Absence of itching, edemas with typical localisation in the extremities, skin and mucosa of internal organs are usual. Damaging the upper respiratory tract the edema usually located above the larynx, with widespreading to labiums, tongue and a pharynx. Edema in the abdominal organs, as a rule, is accompanied by the severe spastic spasm of smooth musculature, nausea, vomiting and diarrhea. The clinical picture often reminds “acute abdomen” or intestinal obstruction. Urticaria is not common in HAE, however some patients have a skin rash reminding multiform erythema in the prodromal stage of the edema. HAE symptoms develop within several

hours, they persist for 12–36 hours and disappear within 1–3 days. The frequency of the exacerbation can vary from weekly episodes to once a year. Thus, the diagnosis of HAE is most often occurred in patients with a life-threatening edema which is resistant to traditional treatment, in the relatives of the patient with the diagnosis of HAE and in the persons who have been ill for many years, when disease was regarded as an allergy or psychosomatic disorder. Any of the factors, capable to cause a complement activation on the classical way, kallikrein-kinin system or the blood clotting stage, contributes to an increase in the need for a C1-inhibitor and is the potential trigger of the exacerbation: a trauma, a surgical intervention, odontectomy procedure, medicines as angiotensin converting enzyme inhibitors, contraceptives containing estrogen, drugs of hormone-replacement therapy; infections, stress. Chronic foci of infection which quite often do not have clear clinical manifestations, such as Helicobacter Pylory infection, are associated with more obstinate course of HAE.

Principles of Quincke's edema treatment:

1. Elimination of causally-significant allergens.
2. Following a drinking regimen (not less than 30-40 ml of water per 1 kg of body mass daily).
3. Considering participation of Histaminum in the formation of all urticaria symptoms, antihistamine medicines of the 2nd generation (Parlazin, Zirtek, Kestin, Erius, etc.) are select medicines. Besides their direct antihistamine activity, they have anti-inflammatory activity.
4. Enterosorbents (activated (absorbent) carbon, Polyphepanum, Enterosgel etc.).
5. Face and neck angioedema treatment: Prednisolonum of 60–90 mg IM, Tavegilum 2.0 ml IM.
6. In case of HAE development an ethiological treatment is the replacement therapy (injection of C1-inhibitor), for first aid treatment we use: epsilon — Acidum aminocapronicum, Adrenaline — for a larynx edema, injection of fresh blood plasma.

ACUTE ANAPHYLAXIS (ANAPHYLACTIC SHOCK)

Acute anaphylaxis (AA) is a clinical syndrome with variety of mechanisms, clinical signs and severity, a rapidly developing life-threatening reaction based on immune mechanisms. Etiological factors of AA are: food products (especially peanuts), medicines (more often — penicilline group, non-steroid anti-inflammatory drugs, radiocontrast materials, anaesthetics, Serums, etc.), insects (Hymenoptera, ants, mosquitoes), inhalation allergens (pollen of plants, animals — a cat, a hamster, a horse).

More severe AA proceeds in people with mastocytosis, thyroid gland pathology, mental diseases, alcohol and drug addiction, ischemic heart disease, bronchial asthma, taking soporific and sedatives, beta-blockers, monoaminoxidase inhibitors, APE inhibitors.

Acute anaphylaxis (anaphylactic shock) classification. Clinical variants of anaphylactic shock:

- light degree;
- medial degree;
- serious degree.

Clinical Features of AA:

1. It is not associated with dosage.
2. Positive allergic anamnesis.
- 3 It develops when the allergen penetrates the body repeatedly (immunologic memory).
4. Genetic predisposition.

Clinical manifestations of AA (Fig. 5):

- cardiovascular system: weakness, sweating, hypotension, tachycardia, retrosternal pains, collapse, arrhythmia, possible cardiac arrest;
- respiratory organs: rhinitis, sneezing, dysphonia, dyspnea, tussis, bronchospasm, larynx edema, stridor, asphyxia;
- central nervous system: fear, anxiety, itching, transitory hearing disorder, vision disorder, coma;
- skin: itching, hyperemia, urticaria, Quincke's edema;
- gastrointestinal tract: nausea, vomiting, abdominal pains up to the development of intestinal colic, diarrhea;
- urinary tract: anuria due to a decrease of filtration pressure in the kidneys.

Variants of atypical AA:

1. Asphyctic.
2. Hemodynamic.
3. Abdominal.
4. Cerebral (clinical manifestations correspond to one of a body system disorder (1 — respiratory, 2 — blood circulation, 3 — gastrointestinal, 4 — mainly symptoms of central nervous system damage).

Clinical criteria for the diagnosis of anaphylaxis see on Fig. 6.

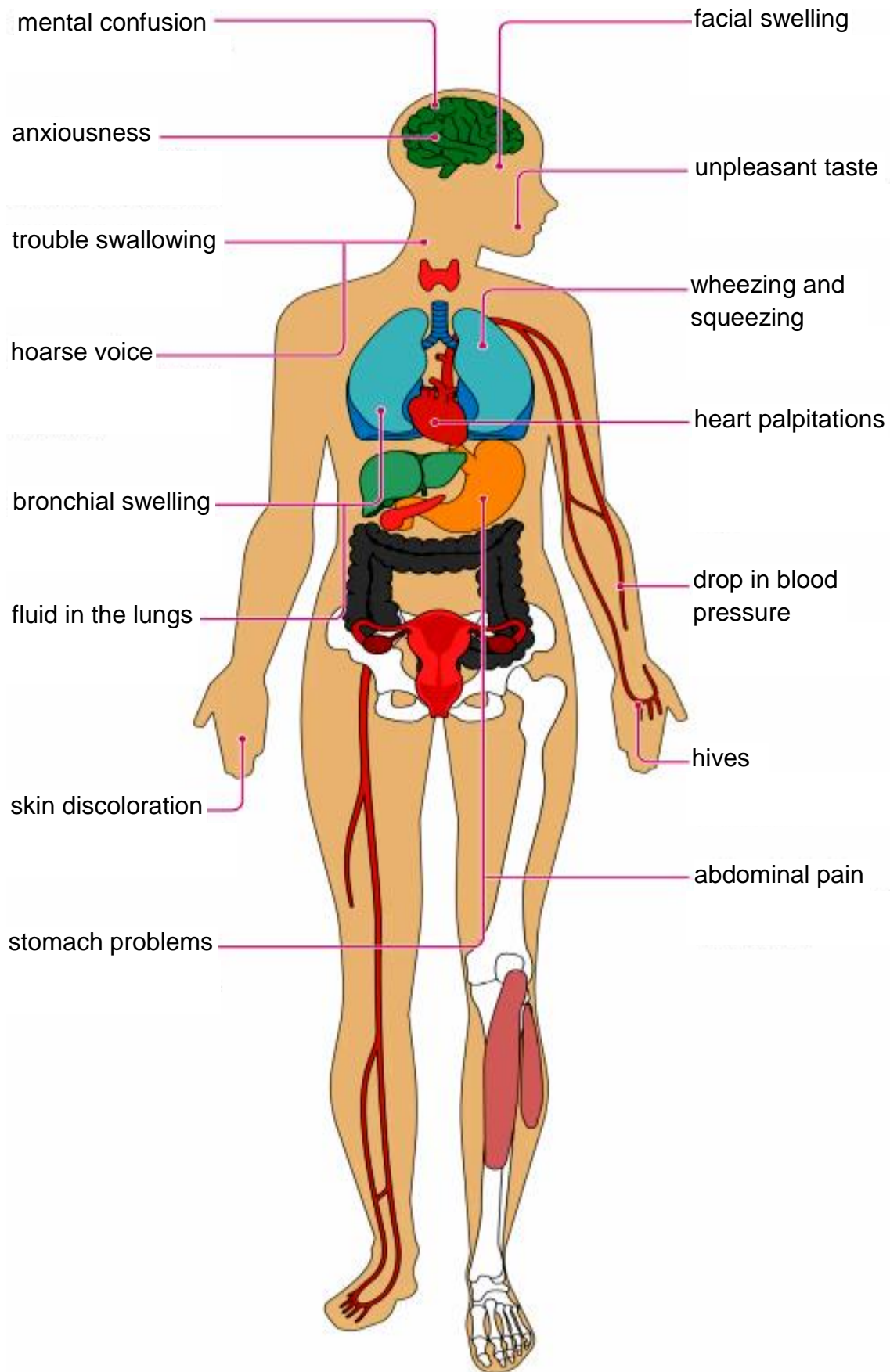
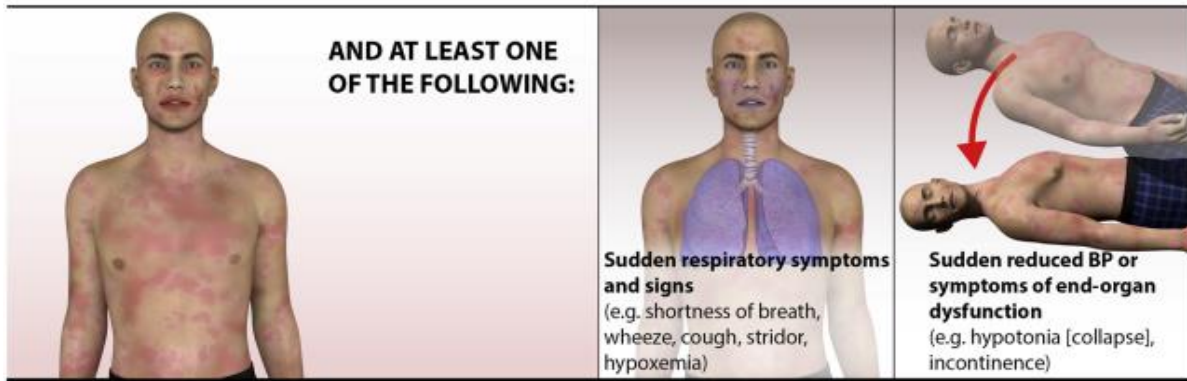


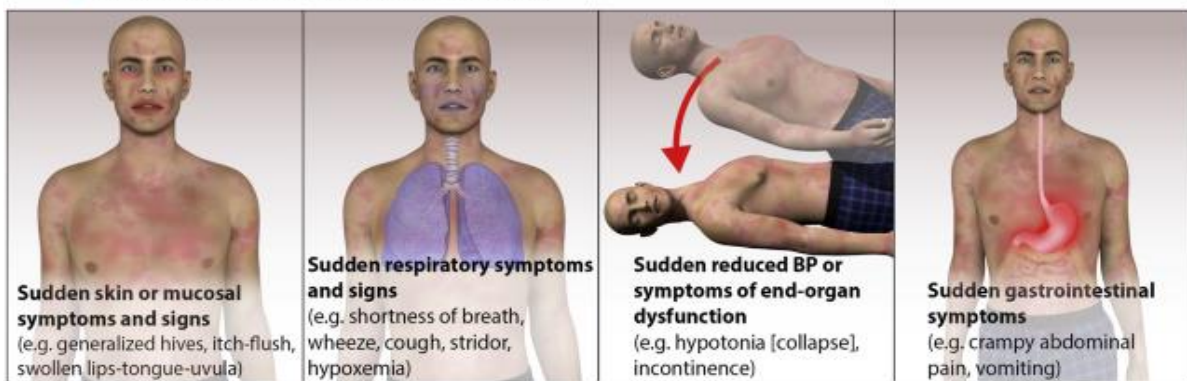
Figure 5. Clinical manifestations of AA (D. Sullivan, A. Pietrangelo. 2018)

Anaphylaxis is highly likely when any one of the following three criteria is fulfilled

- 1** Sudden onset of an illness (minutes to several hours), with involvement of the skin, mucosal tissue, or both (e.g. generalized hives, itching or flushing, swollen lips-tongue-uvula)



- OR 2** Two or more of the following that occur suddenly after exposure to a *likely allergen or other trigger** for that patient (minutes to several hours)



- OR 3** Reduced blood pressure (BP) after exposure to a *known allergen*** for that patient (minutes to several hours)



* For example, immunological but IgE-independent, or non-immunologic (direct mast cell activation)

** For example, after an insect sting, reduced blood pressure might be the only manifestation of anaphylaxis; or after allergen immunotherapy, generalized hives might be the only initial manifestation of anaphylaxis.

*** Low systolic blood pressure for children is defined as less than 70 mm Hg from 1 month to 1 year, less than (70 mm Hg + [2 x age]) from 1 to 10 years and less than 90 mm Hg from 11 to 17 years. Normal heart rate ranges from 80 - 120 beats/minute at age 3 years; and from 70 - 115 beats/minute after age 3 years. In infants and children, respiratory compromise is more likely than hypotension or shock and shock is more likely to be manifest initially by tachycardia than by hypotension.

Figure 6. Clinical criteria for the diagnosis of anaphylaxis

Anaphylaxis is likely when 1 of 3 criteria are fulfilled: 1) acute onset of an illness (minutes to hours) with involvement of the skin, mucosal tissue, or both with either respiratory involvement or reduced blood pressure (BP)/associated symptom of end-organ dysfunction; 2) > 2 of the following that occur rapidly after exposure to a likely allergen for the patient, including involvement of skin-mucosal tissue, respiratory involvement, reduced blood pressure or associated symptoms, or gastrointestinal symptoms; 3) reduced blood pressure as a result of exposure to a known allergen trigger (by M. S. Shaker, MD, MSc et al. // J. Allergy Clin. Immunol. Vol. 145, N 4).

PRINCIPLES OF ACUTE ANAPHYLAXIS THERAPY

First aid therapy of AA:

1. Give the patient a horizontal position, raise his legs.
2. Make sure airways are free.
3. Stop medicine injection (if it is the reason of AA), use cold, a tourniquet locally.
4. Adrenaline 0.1 % 0.3–0.5 ml or Epinephrinum 0.18 % 0.5 ml IM (the most optimal is the injection of Prednisolonum of 90–120 mg or Dexamethazonum of 12–20 mg into the deltoid muscle of the shoulder or into quadriceps hip muscle; beta-agonists (Berotek, Salbutamolum) are used for bronchospasm treatment, antihistamines (except Pipolphenum, Fenotiazin which attack the central nervous system).
5. Hypovolemia treatment: physiological solution (usually saline solution), Ringer`s solution up to 100 ml a minute IV dropwise.
6. Body warming.
7. Access to fresh air, oxygen therapy, treatment of a convulsive syndrome (Diazepamum).
8. In severe cases — intubation, tracheotomy, artificial lung ventilation.

BRONCHIAL ASTHMA

Bronchial asthma is a recurrent disease with reversible obstruction of respiratory ways which causing asthma attacks and developing as a result of allergic or pseudo allergic congenital or acquired bronchial hyperreactivity to allergens and nonspecific factors (Fig. 7).

So, reversible obstruction underlies clinical manifestations of bronchial asthma (Fig. 8) — asthma attacks (attacks of mixed dyspnea up to asphyxia development).

Principles of Treatment of an Asthma Attack:

- selective beta-2 agonists (Salbutamolum, Berotek; cholinolytics (Atrovent) and their combination (Berodual) — two inspirations (maximum 8 inspirations a day);
- in severe asthma attacks: additionally Prednisolonum 60–90 mg IV; 2.4 % solution of Euphyllinum IV (5–10 ml dropwise with isotonic solution of Sodium chloridum).

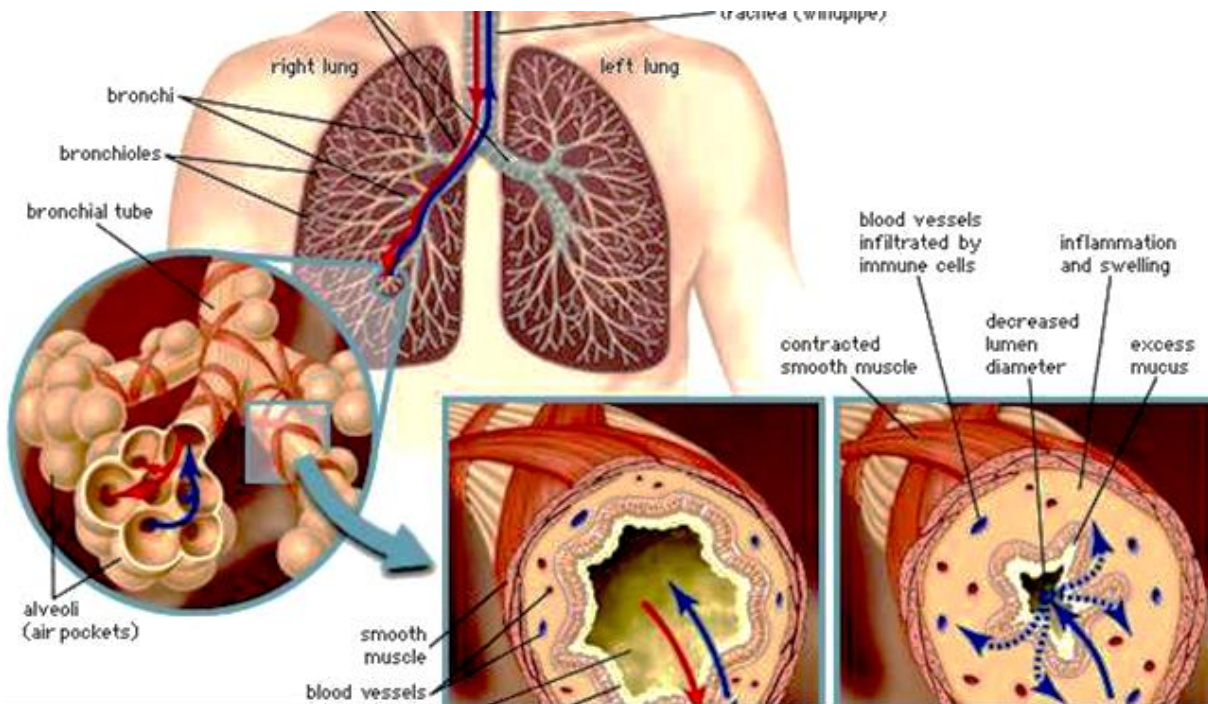


Figure 7. Bronchial Asthma Pathogenesis (J. Hansen-Flaschen, PM, University of Pennsylvania, Philadelphia)



Figure 8. Bronchial Asthma symptoms, causes and triggers (<https://www.medlife.com/order>)

ASTHMATIC STATUS

Asthmatic status is one of the most serious complications of bronchial asthma. There is an acutely progressing obstruction of respiratory tracts (with the expiratory stridor) with development of an acute hypoxia and hypercapnia with discirculatory disorders, expressed dysmetabolism, and as consequence, a high risk of brain edema, coma and asystole.

Clinical features of asthmatic status. Become perceptible increasing:

– acute hypoxia, hypoxemia with hypocapnia (stage 1), hypercapnia (stage 2), hypercapnic coma and severe dysmetabolic and discirculatory disorders (stage 3);

- decrease of beta-2-adrenoreceptors sensitivity to Catecholamines;
- accumulation of contents in the bronchial tree owing to the expressed obstruction and formation of “a silent lung”;
- severe vegetative (autonomic) nervous system dysfunction.

Clinical manifestations of the 1st stage: tachycardia, tachypnea, skin pallor, slight dizziness, laryngospasm during expiration, decrease of sputum amount and airflow power, a tendency to increase in arterial pressure, weakened vesicular breathing on auscultation, a tendency to rhonchi disappearing.

Clinical manifestations of the 2nd stage: increase of obstruction, cyanosis, rhonchi disappearing («a silent lung» symptom).

Clinical manifestations of the 3rd stage: coma (hypoxic, dysmetabolic, dyscirculatory).

Treatment of asthmatic status:

1. 2.4 % solution of Euphyllinum IV with Sodium isotonic chloride solution every 4–6 hours.

2. Correction of blood pH.

3. Solu-Medrolum of 60–90 mg IV dropwise.

4. Ringer-Locke’s solution IV up to one l a day for sputum dehydration.

5. Expectorants (Ambroxol IV slowly 2 ml).

6. In case of tachypnea and tachycardia, and normal or high arterial blood pressure, excitation presence — Droperidolum 1 ml (2.5 mg) IV slowly in 20 ml with 5 % glucose solution.

7. In progressing lung ventilation impairment with pH decrease more than below 7.3 and an increase in PaCO₂ to 70 mm hg — artificial lung ventilation in Intensive Care Unit.

8. After removing the patient from asthmatic status — maintenance therapy with glucocorticosteroids up to 32–48 mg of Medrolum a day, prolonged Methylxanthines (Teotard with a dose of 200–500 mg depending on peak flowmetry results) and Oxygen therapy (36–42 % of Oxygen) up to 20 minutes, in the presence of a concomitant bronchitis — Atrovent, Lazolvan with the prolonged course.

MEDICATION ALLERGY

Allergic reactions to medications are usually observed within 5–7 days from the beginning of their administration (the so-called sensibilization period). There are 4 types of allergic reactions:

1) stormy development-from several minutes to several hours: it is immediate, the so-called reagin variant, Ig-E-dependent, type I);

2) adjourned (within 7–9 hours — types II–III);

3) sluggish (within 2–3 days — cellular, time-delayed, type IV), affecting different systems and organs. The most terrible complications, undoubtedly, are an anaphylactic shock (immediate type 1 responses) and a number of polysystemic lesions — a scalded skin syndrome, Stevens-Johnson syndrome (type 2 responses, cytotoxic), a serum disease (immunocomplex type 3).

In certain cases, the medicine allergy imitates deterioration of the main disease (for example, an increase in number and severity of bronchial asthma attacks). In such cases it is possibly to suspect unfavorable, inadequate effect of medication therapy taking in consideration an increasing eosinophilia of peripheral blood or sputum, or affixion of other manifestations of allergic reactions (urticaria, dermatitis, the reaction “in situ” such as Artijus phenomenon at the place of medicine injections — with inspissation, hyperemia, morbidity, skin itching).

The most common clinical syndrome of MA is the lesion of the skin which can have a various character and makes up to 70 % of cases of allergic reactions to MA.

It should be noted that a number of drugs are capable of inducing true and false allergic reactions simultaneously. It can be caused by the capability of some substances to cause the release of Histaminum from mast cells and basophiles in nonspecific way (without the participation of the immune system (histaminoliberation). Similar properties have such drugs as iodine substances, X-ray contrast agents, Mannitolum, Tetracyclinum, dextrans, serum albumin, Indomethacinum, Aspirinum, Codeinum, Carbacholinum, Morphinum, Promedolum. Such false-allergic reactions more often occur in patients with gastrointestinal tract diseases, hepatobiliary system pathology, neuroendocrine disorders, as well as eating some food products — with a high concentration of Histaminum or a tyramine (tuna, bloater, sardines, strawberry, jerked ham, spinach, beer yeast, Cheddar cheese, food supplements — stains and conserving agents).

As a whole all methods of laboratory diagnosis have low sensitivity and specificity. Therefore they have no independent value in the diagnosis of a medicine allergy, and are used only as an auxiliary aid to confirm the anamnesis of the allergy or to select a “safe” medicine. A trial intake of a small medication dose could become “the gold standard” for confirmation of a medication allergy. But in connection with the high potential danger of this test it is practically not used.

Responses of immediate type are estimated by means of sublingual or dermal tests, an enzyme immunoassay, Mast cell degranulation test.

Responses of delayed type are reproduced using application tests. It is possibly to estimate the time-lag reaction to a medication by the results of intradermal testing (the infiltrate and a hyperemia in these cases occur in 24 or 48 hours after the allergen injection).

Principles of MA treatment are:

- stop taking medication;
- drug elimination from the body;
- keeping to a hypoallergenic diet during treatment;
- symptomatic and pathogenetic therapy;
- desensitization (deallergization) to the drug.

Symptomatic treatment in the overwhelming majority of cases is restricted to antihistamine drugs usage. On hunger days it is better to prescribe antihistamine drugs parenterally, and then orally until the symptoms of an allergic reaction disappear complete. If the treatment lasts more than 10 days it means that for the first generation antihistamine drugs the medicine must be changed (the effectiveness decreases with prolonged treatment), the second generation of H1-receptors antagonists maintains activity even with prolonged use.

If the initial allergic symptoms are severe (Quincke's edema, anaphylactic shock, bronchospasm, skin lesions), or, despite the taken measures, the state worsens, glucocorticosteroids must be administered (60–90 mg of Prednisolonum parenterally).

Severe MA forms (Stevens-Johnson's syndrome, scalded skin syndrome, recurrent or prolonged course of anaphylactic shock, etc.) can require higher doses of steroids (up to 700–1500 mg of Prednisolonum a day) and obligatory hospitalisation into an intensive care unit (in case of Lyell's syndrome — a in burn centre). Other methods of treatment include plasmapheresis and hemosorbtion — for the treatment of severe immunocomplex reactions and Lyell's syndrome; parenteral injection of 5 % ε-aminocaproic acid solution (100 ml intravenously dropwise every other day three times) must be administered in cytotoxic type of immune reactions and in certain cases of immunocomplex reactions.

Steroids for external using (ointments, creams, eye and ear drops) are applied in skin and mucosa lesions.

PRINCIPLES OF ACUTE ALLERGIC PATHOLOGY PROPHYLAXIS

HYPALLERGENIC LIFE

It is necessary to air the apartment thoroughly, to control the freshness of the air at night; to use air-cleaning devices, air conditioners.

It is better to choose rooms which are exposed to sunlight as bedrooms; in the winter it is preferable to use UV lamps.

It is recommended to maintain the temperature in the room not higher than 21–23 degrees Celsius, the relative humidity of the air — less than 50 %, as mites — dermatophages (house dust allergy “originators”) reproduce at a relative humidity of 75–80 % and cannot survive in less than 50 % relative humidity.

Acaricides (benzyl benzoate, tannin acid, metilpirimidol, pyretoids) are not recommended as their harmlessness with a long-term use is not proved.

Daily wet sweeping of the floor and other smooth surfaces is obligatory.

Handling of bedding by the vacuum cleaner not less than two times a week is obligatory; it is preferable to use a washing vacuum cleaner or a vacuum cleaner a the filter.

It is recommended to take away all unnecessary things accumulating dust: carpets, curtains, upholstered furniture and etc.

Storage of books, clothes, linen in the closed (glassed-in) cabinets and their regular cleaning.

Take away heavy curtains from premises. Curtains should be cotton or linen, they need to be washed often in hot water. The vertical jalousie (not horizontal on which the dust accumulates) is more preferable.

Furniture that can be wiped is preferred. The furniture upholstered in fabric should be vacuumed at least 2 times a week, including handles, backrests and armrests.

It is necessary to use special anti-allergic protective covers for mattresses, blankets and pillows.

They exclude the impact of epidermal allergens: feather, wool from which they are made. Synthetic pillows, mattresses and blankets do not provide sufficient protection against the contact with mites. Mites can live in synthetic bedding as well, therefore synthetic bedding, children's toys and bed-clothes must be washed weekly at 60 degrees C. Toys can also be vacuumed or placed in the freezer ($-20\text{ }^{\circ}\text{C}$) overnight to reduce the number of mites.

HYPOALLERGENIC DIET

Diet therapy principles (see App. 1) are:

1. Limitation or complete elimination of food products with a high sensitizing activity (eggs, fish, caviar, honey, chocolate, coffee, cocoa, as well as berries, fruit and vegetables that have orange and red colouring: strawberries, raspberries, peaches, apricots, citrus, carrot, tomatoes).

2. Complete elimination of causally significant food allergens.

3. Meeting physiological needs for the basic nutrients and energy through the adequate replacement of excluded food products.

4. Gradual dilating of the diet introducing previously excluded food products taking into account their individual tolerance.

5. Strict observance of the rules of cooking food products.

6. Food products and dishes having irritating effect on digestive organs — broths, spicy, salty, fried food, canned food, smoked products, spices, offals and other foods with supplements (stains, conserving agents, emulgents) — marmalade, marshmallows, pastilles, pastries, cakes, fruit waters, syrups, etc.).

7. Limit flour, bread, bakery and macaroni products; whole milk, curds, sour cream, cream, butter; sugar up to $\frac{1}{2}$ the age norm; salt to 2–3 g a day.

8. The food products recommended for including into the hypoallergenic diet include berries and fruit of a light color: apples, light variety of currants, yellow cherries, gooseberries, pears, bananas, etc.; vegetables of green and white colors: green-head cabbage, cauliflower and Brussels sprouts, vegetable marrows, squash, turnips, potatoes, swede, cucumbers; milk products (kefir, biolact, clotted milk, Acidophilin, Caucasian milk, etc.); cereals (rice, buckwheat, oat, pearl); meat (beef, low-fat mutton, rabbit, turkey); vegetable oils (sunflower, corn, olive, soybean) and cooking butter; bread (wheat of the second breed); Saccharum (Laevulose, Xylitol).

9. While cooking meals it is recommended to keep the following basic rules: food products are steamed or boiled, mashed; potatoes and cereals are soaked in cold water for 12–18 hours; meat is boiled twice.

ORGANISATION OF HYPOALLERGENIC LIFE IN CASE OF HYPERSENSITIVITY TO ANIMAL EPIDERMIS

Dandruff, saliva and urine of animals are potential allergens. On the hair/fur of animals dust, mold and pollen can settled and be carried from place to place. The best way of the contact minimization in case of meeting with these group of allergens is to avoid having domestic animals with fur or feathers. Allergenicity of animals does not depend on length of their fur; there are no absolutely non-allergenic animals. Cockroaches that often come up in dwellings, can cause allergy. The correct storage of food, regular sweeping and drying of the kitchen prevents occurrence and spread of cockroaches.

If the patient has allergic reactions, the following measures can help:

– if possible to keep the animal out of door. Do not let the animal into the bedroom;

– wash arms after touching an animal;

– wash the animal regularly;

– replace feather pillows and feather-beds with sintepon items;

– do not wear clothes made from wool and fur;

– the injection of following Serums is forbidden: antitetanic, antirabies, antitubulinic, anti-diphtheria, antilymphocytic Serum and Immunoglobulins.

ORGANISATION OF HYPOALLERGENIC LIFE IN CASE OF HYPERSENSITIVITY TO MOULD FUNGI

It is necessary to exclude the following products from the feeding: cheese, kefir, yoghurt, sweet cheese masses, dried fruits, grapes, grape juice, sauerkraut, pickled cucumbers and tomatoes, items from a fresh yeast dough, kvass, beer, dry wine, champagne, vinegar, soy-bean sauce, mushrooms. All fruits must be peeled.

It is not recommended to be in damp, badly aired rooms with leakings, mould on the walls, with the damp cellar, to visit vegetable storages, haylings, grain warehouses.

It is necessary to control the absence of damp spots on ceilings and walls in the house. The accumulation of moisture promotes the growth of a mould fungi. If there is fungus on the walls, you should contact the sanitary and epidemiological station, consult about drugs that the mould must be treated with. It is recommended to treat the places of leakings with a quartz lamp, to take measures to improve living conditions (repair the roof, drain the basement).

It is important to wash a bathtub and a shower booth regularly by means of special cleaning agents, timely repair a leaking tap or a leaking roof, often wash and empty the collectors where water accumulates; in order to avoid the occurrence of mould do not leave damp linen and clothes rolled up in the washing machine, dry linen immediately after washing in a special drying machine with air outlet to the outside. Do not hang laundry and clothes outside, as pollen and mold in the air can settle on things. It is necessary to put filters on the ventilation heating openings, to change filters regularly.

It is not recommended to work with soil and compost in a village, to clean mushrooms, to work in rooms with high air humidity (greenhouses, etc.). It is necessary to remove leaves and weeds before they start to rot.

THE ORGANISATION OF A HYPOALLERGENIC LIFE AT A POLLINOSIS

Limitation of staying outside in sunny windy weather is necessary; going out for a walk it is necessary to protect your eyes with tight-fitting glasses, and after returning home — change clothes, to take a shower, rinse your mouth, wash your eyes.

It is necessary to avoid trips to the nature, where there is a high concentration of pollen allergens.

Control of pollen concentration in the room (closed windows and doors, air conditioner, dampers and air purifiers, water vacuum cleaners) is important.

It is obligatory to make air the room at night, when the concentration of pollen in the atmosphere is minimum.

It is necessary to cover windows and doors with wet bed-sheets or a four-layer gauze.

It is necessary to make the wet sweeping daily.

Remember that indoor plants (a geranium, a primrose), garden and wild flowers (a lilac, a jasmine, a rose-tree, a lily of the valley, a violet, etc.) can cause exacerbations of the disease because of common allergens with pollen from trees, meadow grasses and weeds.

Remember that the best place for the summer holiday are shores of water bodies.

Limit obligate food allergens in the diet, especially in the spring-summer period (see App. 2), as well as products of plant origin that have common allergens with pollen of allergenic plants.

Do not use phytodrugs in the treatment of associated diseases; honey (it contains about 10 % pollen), Propolisum.

It is forbidden to travel to other climatic zones during the flowering period of plants in the area of the health resort chosen by the patient.

It is not recommended to grow flowers (it is necessary to remove flowers from the room where the patient sleeps as mould fungi can multiply in flower pots).

It is recommended to sanitize the fingernails, mucosas and the skin of feet affected by fungal infections.

It is forbidden to take antibiotics of the penicillin, cephalosporin, tetracycline series.

It is not recommended to spend holidays in areas with a subtropical climate (the Black Sea coast of the Caucasus, some coastal regions of Turkey, etc.). Areas with dry climates (the Crimea, Bulgaria, Cyprus, Spain) are recommended.

It is important to equip the rooms with air conditioners, keeping microclimate parameters (low humidity, the temperature conditions 21–23 degrees).

RECOMMENDATIONS TO THE PATIENT WITH HYPERSENSITIVITY TO ASPIRIN

In order to control the course of the disease successfully, it is important not to take drugs of the pyrazolone series as Analginum, Rheopyrinum, Spazmalgon, Tempalgin, Baralginum, Theophedrinum, etc.; Acidum acetylsalicylicum and drugs containing it (Plidol, Tomapirin, Citramonum, Askofen, etc.); other non-steroid anti-inflammatory drugs and the drugs containing them in the composition (Diclofenac, Indomethacin, Ibuprofen, Voltaren, Piroksikam, Naproxenum, etc.).

The use of tartrazine — a yellow stain E 102, similar in the chemical structure to Aspirinum is also excluded. Do not take yellow or yellow-coated drugs (tablets, a pills) (No-spa, Tavegilum, Ketorol, etc).

If necessary to use pain-killers or antipyretic therapy it is recommended to take Paracetamolium (Atsetaminofen, Panadolum, Efferalgan), Solpadein, Phenacetin, Tramadol (Tramal).

It is necessary to remember that some food products contain stains and the conserving agents for food conservation used in the food-processing industry (Sodium sulfitums, Benzoas, tartrazine, etc.).

It is not recommended to take all products that include industrial or natural salicylates. They are similar in their structure to Aspirinum. Salicylas are included into canned food, in gastronomic products (sausages, ham, pork). Tartrazine is included into the dough of cakes, pies, pastries, fruit candy,

marmalade, oil, marshmallows (soufflé sweetmeat), creams and macaroni products of the yellow colour, fruit and low alcohol beverages, sweets, cookies and dragees. Natural Salicylas are found in raspberries, European black currants, blackberries, cherries, peaches, melons, gooseberries, almonds, apricots, plum (drainage), grapefruits, grapes, raisins, winter greenery, lemons, oranges, beverages from carrots, beets, radishes, young potatoes, tomatoes and cucumbers.

RECOMMENDATIONS TO THE PATIENT WITH INSECT ALLERGY

Extra care should be taken in the summer in the open air: while working in the yard, rest in the open air.

Wear shoes outside the house.

Do not wear loose clothes, where insects can tangle.

It is advisable to avoid clothes made of bright, motley fabrics, especially of yellow and dark blue colours, with a floral drawing which attracts hexapods.

The clothes of white, green, brown and khaki colours are preferable.

Do not use perfumes, lotions, colognes, perfumed soaps and hair care products with a strong odour.

Before the journey in a car it is necessary to check, whether there are no hexapods, the car windows should be closed.

Being near hexapods, do not make sudden movements. Hexapods do not usually attack themselves.

It is necessary to remove beehives and nests near the house. Patients with an allergy to poisons of hexapods must not do it.

Insect repellants do not provide the complete protection against hexapods, and the desensibilisation does not relieve the need of taking precautionary measures.

Patients with the allergy to hexapods poisons should always have an identification badge or bracelet with them.

It is necessary to wear a first aid kit with you. Family members and relatives should be able to use them.

After first-aid treatment, consult a doctor immediately.

RECOMMENDATIONS TO THE PATIENT WITH ALLERGY TO COSMETICS

Preventive measures:

Do not use the perfumed cosmetics.

Do not use perfumes, deodorants, lipsmites applied to the skin in the sunlight.

Select creams, cosmetic water and make-up carefully, as well as hair-dyes.

Dye the eyelashes as seldom as possible, without touching the skin with the paint.

Apply the cream with special sponges (use no more than 4 months).

Do not touch your face, neck and eyelids with your fingers until the varnish applied to the nails dries (10–15 minutes after that it ceases to be an allergy source).

The best soap is white, odorless, non alkaline.

You must remove your make-up before going to bed and best of all with vegetable oil.

Do not use cosmetic agents containing conserving agents — parabens, foaming agents — laurilsulfats, fragrances (cinnamal and its derivatives, limonene, linalool), synthetic and mineral syrups, silicones, cocamidopropylamines (they are a part of some shampoos), triclosan, phenoxyethanol (together with benzoates included in the components of wet wipes).

In tooth pastes, besides lauryl sulfates, irritating components can be titanium dioxide, chlorhexidine bigluconate, cetylpyridinium chloridum.

ABOUT THE IMPACT OF HOUSEHOLD CHEMICAL GOODS ON HEALTH

Surface active substances (SAS). Anionic surfactants are the most common, effective, cheap and toxic. SAS often cause skin drying, epidermal decondensation, skin itching, skin hyperemia, impairment of skin protective functions. In case of regular entering the human body they will cause damages of the liver, kidneys, eyes. SAS are extremely badly rinsed with water (six to eight times rinsing with warm water is necessary). SAS are capable of persisting on a fabric for 4 days.

Phosphates are added to powders to protect against a scale deposit, soften water and to improve washing. They are badly rinsed out, very strong allergens, provoke the growth of blue-green algae in water bodies. Their natural analogues — Citrats, Zeolites are less negative in soap powders.

Volatile organic substances: butane, isobutane, a formic aldehyde, oil distillates are added to fabric softeners, paints, tars, waxes and polishes, dry-cleaner fluids, aerosols for hair. They are capable of causing allergic reactions, leading to the development of bronchial asthma, speeding up headaches and depressions.

Chlorine ((calcium) sodium hypochlorite), Chloraminum, dichloroisocyanuric acid sodium salt) are most commonly found in bleaches. Chlorine and its compounds contribute to the occurrence of atherosclerosis, arterial hypertension, anaemia and other diseases of the cardiovascular system, the irritation of eye mucosa and mucosa of the upper respiratory tract, can negatively influence on the skin and hair, enlarge the risk of allergy and oncology diseases. Preference should be given to bleaches where the active agent is the atomic oxygen.

Nitrobenzol (in floors and furniture polishes, ammonia — in glass cleaners) is also toxic.

PROPHYLAXIS OF ALLERGIC REACTIONS TO HOUSEHOLD CHEMICAL GOODS

It is necessary to reduce the use of HCG to a minimum, give preference to natural detergents: lemon, soda, vinegar, mustard powder.

It is important follow the exact dosage of HCG.

Less aggressive liquid detergents are preferred.

During cleaning it is necessary to use gloves, a face mask.

It is necessary to use a regimen of an additional rinse with a machine wash, with a hand wash-rinse 6–8 times.

It is impossible to mix various agents of HCG with each other in order to avoid the of formation more toxic substances.

It is necessary to air the room after cleaning and washing.

Wash dishes only with warm water, rinsing out 4–5 times, within 15–20 seconds.

TEST CONTROL

1. Causes of urticaria are:

- a) food products;
- b) medications;
- c) pollen allergens;
- d) house dust mites;
- e) latex allergy;
- f) poison of Hymenoptera;
- g) epidermal allergens.

2. Quincke's edema is characterized by the following manifestations:

- a) cutaneous edema;
- b) hypodermic fat tissue edema;
- c) edema of various organs and systems;
- d) tachycardia;
- e) BP increase;
- f) skin itching.

3. On auscultation of the lungs in case of the 2nd stage of Asthmatic Status reveals the following:

- a) bronchial breathing;
- b) weakened vesicular breathing;
- c) «a silent lung» symptom;
- d) rough breathing.

4. On auscultation of the lungs in case of the 1st stage of Asthmatic Status reveals the following:

- a) bronchial breathing;
- b) weakened vesicular breathing;
- c) saccadic (intermittent) breathing;
- d) dry rales (rhonchi).

5. Complaints of patients with acute urticaria are:

- a) skin itching;
- b) skin rash;
- c) pain in the thorax;
- d) edema;
- e) dyspnea.

Answers: 1 — a, b, c, d, e, f, g; 2 — a, b, f; 3 — c; 4 — b, d; 5 — a, b.

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BASIC RULES OF THE UNIVERSAL HYPOALLERGENIC DIET

It is not recommended to use	it is possible to eat
Citrus	Low-fat beef, boiled
Walnuts	Soups: cereal, vegetable a) in secondary beef broth b) vegetarian
Fish and fish products	butter, oil: olive, sunflower
Poultry and products from them	Boiled potatoes
Chocolate and chocolate products	Porridge: buckwheat, oatmeal, rice
Coffee	Lactic acid products (curd, kefir, clotted milk)
Smoked products	Fresh cucumbers, parsley, dill
Vineger, mustard, mayonnaise and other spices	Baked apples, water-melon
Horse-radish, small radish, redish	Tea
Tomatoes, eggplants	Sugar
Mushrooms	Compotes from apples, plums, currants, cherries, dried fruit
Eggs	White bread
Milk	
Strawberry, wild-strawberry, melon, pineapple	
Fancy pastry(Sweet dough)	
It is strictly forbidden to use any alcoholic beverages	
It is not recommended to use	In nutriment(nutrition) it is possible to use
Citrus	Low-fat beef meat, boiled
Walnuts	Soups: groat, vegetable a) on the secondary beef cook water b) vegetarian
Fish and fish yields	Creamy butter, oil: olive, sunflower
Auk and items from them	Boiled potato
Chocolate and chocolate confectioner	Gruel: buckwheat, oat, rice
Coffee	Lactate yields (curd, kefir, clotted milk)
Smoked items	Fresh cucumber, parsley, dill
Acetum, mustard, mayonnaise and other spices	Baked apples, water-melon
Horse-radish, small radish, redish	Tea
Tomatoes, eggplants	Saccharum
Mushrooms	Compotes from apples, plums, currants, cherries, from a dried fruit
Eggs	White bread
Milk	
Strawberry, strawberry, melon, pineapple	
Fancy pastry(Sweet dough)	
It is categorically forbidden to use any alcoholic beverages	

POSSIBLE VERSIONS OF INTOLERANCE TO RELATED PLANT ANTIGENS, FOOD PRODUCTES AND PHYTODRUGS IN ALLERGY TO POLLEN OF PLANTS

Etiological factor (pollen)	Possible cross-allergic reactions		
	Pollen, leaves and caulisse of plants	Vegetable Food products	Medicinal Plants (Phytodrugs)
Birch	Filbert, alder, apple-trees, etc.	Birch sap, apples, pears, kiwi, cherries, sweet cherries, peaches, apricots, plums, olives, lambert nut, persian walnuts, almond, carrots, greenery and spices (celery, dill, curry, anise, cumin), potatoes, tomatoes, peppers, cucumbers, onions	Birch leaf (Buds), alder knobs, buckthorn bark (cortex), etc.
Gramineous grasses	Timothy, fescue, Scleranthus, oats, wheat, barley, rye, corn, etc.	Beer, kvass, corn, peanuts, leguminous, cereals and macaroni products; bread and bakery products or other cereal products or products that contain flour; strawberries, wild strawberries, citrus, sorrel	All gramineous grasses
Weeds	Wormwood (Sage-brush), orach, ragweed, dahlia, chamomile, dandelion, common chrysanthemum, centaurea, sunflower, etc.	Sunflower oil, sunflower seeds and halva, mayonnaise, mustard, chicory; beverages prepared with the use of wormwood (sage-brush) (Absinthiums, balsams); melons and gourds; greenery and spices (celery, dill, cumin, parsley, curry, pepper, anise, nutmeg, cinnamon, ginger and coriander, carrots, garlicks, citrus, bananas, beets, spinach	Coltsfoot (Tussilago Wormwood (Sage-brush), dandelion, chamomile, dahlia, Calendulae, farfara), Inula, beggarmites, milfoil, plantain, licorice, Corvalolum, Valocordinum, naphthalene, tansy, mother-of-thyme, etc.

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Арсентьева Ирина Леонидовна
Доценко Эдуард Анатольевич
Арсентьева Наталья Леонидовна

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ОСТРЫХ АЛЛЕРГИЧЕСКИХ ЗАБОЛЕВАНИЙ**

**SYMPTOMS, DIAGNOSIS, PRINCIPLES OF TREATMENT
AND PREVENTION OF ACUTE ALLERGIC DISEASES**

Учебно-методическое пособие

На английском языке

Ответственный за выпуск Э. А. Доценко
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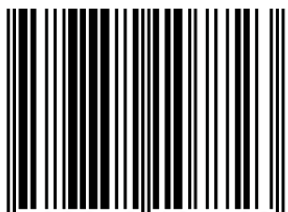
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