Ministry of Health of the Republic of Belarus
Education Institution
"Gomel State Medical University"

Department of Pediatrics with the course of the Faculty of Advanced Training and Retraining

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METHODOLOGICAL GUIDELINES

for a practical exercise
by a teacher with students
4th year of the Faculty of foreign students,
trainees in speciality 1-790101 in the discipline of pediatrics

Topic: Respiratory allergies. Bronchial asthma.

Time: 6 hours

Approved at the meeting of the Department of Pediatrics with the Course of the Faculty of Advanced Training and Retraining
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2022

LEARNING AND EDUCATIONAL OBJECTIVES, TASKS, MOTIVATION FOR LEARNING THE TOPIC

Learning objective:

- to form students' basic professional competence while studying the discipline of Pediatrics according to the curriculum
- to form students' scientific knowledge of allergic diseases in children and their prospects of use in professional activity; skills and abilities necessary for work with patients of different age, knowledge of clinical manifestations of diseases, treatment and diagnostic measures, bases of rehabilitation and prophylaxis.

Educational objective:

- to foster students' sense of professional responsibility of a future medical worker;
- tormation of professionally significant and socially-psychological qualities of the doctor's personality in the system of doctor-nurse-patient relations;
- formation of students' responsible attitude to their future professional activity;
- formation of academic and work discipline, discussion of disciplinary issues (attendance at lectures and practical classes, unexcused absences, tardiness, arrears on missed classes).

Objectives:

As a result of the study session, the student will

know:

-classification of allergens and allergic reactions;
- epidemiology of allergic diseases;
- the main risk factors for the development of allergic diseases;
- specifics of allergy history and physical examination of a patient with or suspected of having an allergic disease;
- Clinical symptoms of allergic diseases in children and their diagnostic significance;
- basic diagnostic methods for allergic diseases;
- groups of medicines used in the treatment of allergic patients;
- Basic principles of ASIT therapy;
-Primary, secondary and tertiary prevention of allergic diseases.

be able to:

- gather an allergological history in a child;
- perform a physical examination of a patient suffering from an allergic disease;
- identify clinical symptoms of allergic diseases in children;
- identify the group of nosologies to make a differential diagnosis;
- construct an examination plan for a child with an allergic disease or in case of suspected allergic disease;
- prescribe treatment for a patient with allergic rhinitis, bronchial asthma (basic therapy);
-provide first aid in case of an attack of bronchial asthma;
- carry out the prevention of allergic diseases.

know:

methods of objective (palpation, percussion, auscultation) and additional (measuring, laboratory, instrumental, histological, immunological, etc.) examination skills of communication with patients of different ages and their parents, medical staff.

Motivation for mastering the topic:

The knowledge and skills acquired during the study of the discipline of paediatrics allow motivating the students to improve theoretical and practical knowledge to carry out early diagnosis, treatment and complex rehabilitation measures for children with chronic and allergic diseases or with suspicion of them; tactics of emergency care.

MATERIAL EQUIPMENT

Tables on the topic of the class, medical records of inpatients, set of haemograms, biochemical blood tests, skin test results, cytological and bacteriological examination of nasal secretions, respiratory function tests, chest X-rays, lung computer tomograms, phonendoscope; scales, stadiometer, tape measure; assignment bank for independent work; selection of case studies of inpatients in the hospital departments.

CONTROL QUESTIONS FROM RELATED DISCIPLINES

1. "Normal Physiology", "Pathological Physiology"

- Types of allergic reactions;
- Risk factors of bronchial asthma in children;
- Mechanisms of obstructive syndrome development;
- prevention of bronchial asthma;
- What is hypoxia and what forms of hypoxia do you know?
- What is respiratory failure and what degrees of respiratory failure do you know?
- Factors contributing to chronic respiratory disease.

2. "Human Anatomy"

- The anatomical and physiological characteristics of the respiratory organs in children of different ages;

CHECKLISTS FOR THE TOPIC OF THE CLASS

1. etiopathogenetic mechanisms of allergic diseases in children.
2. allergic rhinitis. Etiopathogenesis. Classification. Clinic. Diagnostics. Treatment. Prophylaxis. 3.
3. etiopathogenesis of bronchial asthma. Classification.

Features of the clinical course of bronchial asthma in children of different ages.

5. Diagnosis of bronchial asthma.
6. Emergency treatment of an attack of bronchial asthma.
7. Baseline therapy of bronchial asthma. The stepwise approach to its implementation. 8.
8. Prevention of allergic diseases. Allergen specific immunotherapy.

PROCESS OF THE STUDY

Theoretical part

In recent years, there has been an increase in allergic diseases worldwide, including Belarus. The most common one is bronchial asthma. An increase in the incidence of asthma has been noticed since the mid-1980s. Causes include environmental degradation, air pollution by oil products, deterioration of food quality, and sedentary lifestyles. Bronchial asthma has been called a disease of civilisation. At present there are about 235 million patients with bronchial asthma in the world. In Belarus about 0.7% of the population has it. About 10% of them are children.

Bronchial asthma is a chronic inflammatory disease of the airways, based on allergic inflammation and bronchial hyperresponsiveness, which is manifested by respiratory symptoms, such as wheezing, shortness of breath, cough, chest tightness, associated with exposure to specific triggers and occurring mostly at night or early in the morning.

The onset of bronchial asthma occurs in most cases during childhood and adolescence. Bronchial asthma in children is difficult to diagnose in its early stages. The process of disease development is lengthy, associated with the immaturity of the child's respiratory and immune systems. It is important to establish a family history of atopy or bronchial asthma: a family history of allergy on the mother's side is more significant than on the father's side. It is important to identify the relationship between the onset of bronchial asthma symptoms after exposure to an allergen, the seasonal variability of symptoms, and the reversibility of bronchial obstruction. To achieve control of bronchial asthma symptoms, the principle of stepped therapy is recommended. Each step includes treatment options, which may constitute an alternative in the choice of bronchial asthma maintenance therapy.

The reason why bronchial asthma is so important is that poor treatment, untimely diagnosis, and frequent exacerbations reduce the quality of life, social and physical activity of patients. Disability develops in 7% of children with bronchial asthma.[9]

Practical part.

The students are briefed, attention is paid to the rules of internal order, the peculiarities of work in paediatric department №3 (profile allergology). The selection of patients is carried out in accordance with the theme of the lesson. During the practical work the student must carry out:

- collection of complaints and anamnesis of the disease,
- clinical examination of the child,
- make a preliminary diagnosis and develop an examination plan,
- Interpret the results of the laboratory and instrumental methods of investigation,
- Formulation of the final clinical diagnosis,
- Formulation of a treatment and rehabilitation plan,

- Writing prescriptions for medicines

Monitoring the understanding of the topic

1. Demonstration of case studies with clinical case studies:

- Year-round allergic rhinitis, period of exacerbation
- Year-round allergic rhinitis, remission period
- Seasonal allergic rhinitis, acute exacerbation period
- Seasonal allergic rhinitis, remission period
- Bronchial asthma mild intermittent, remission period
- bronchial asthma mild intermittent, exacerbation period
- bronchial asthma light persistent, remission period
- bronchial asthma mild persistent, relapsing phase
- asthma moderate to severe persistent, remission period
- asthma moderately severe persistent, relapsing phase
- Bronchial asthma moderate-to-severe persistent, relapsing phase

2.Decipher the proposed spirograms of children with exercise test and bronchodilators.

3.Solution of situational tasks

Task 1.

A 5-year-old boy M. was examined by a paediatrician for nasal discharge and sneezing. Past medical history: the child became ill 2 years ago, when in April severe itching and burning of the eyes, lacrimation, photophobia, conjunctival hyperemia appeared. Later itching in the nose and nasopharynx, nasal congestion and breathing difficulties joined the described clinical manifestations. Antihistamines, hormonal ointments and topical drops provided some relief. In mid-June the symptoms ceased. Family history says that mother suffers from eczema and the patient himself has had eczema in childhood up to the age of 3 years. Obviously: the boy is of asthenic build. Skin was clean and dry. Breathing through the nose is difficult, the patient scratches his nose and sneezes. There is abundant watery nasal discharge. Eyelids swollen, conjunctiva hyperemic, lacrimation. Respiratory rate is 22 per minute. Breath sounds vesicular in the lungs. Heart sounds are rhythmic and loud. The abdomen is soft and painless. Stool and urination are intact. Scarification tests: sharply positive (+++) with pollen allergens of alder, hazel; latent allergy to wormwood pollen, which has not yet manifested clinically.

Questions:

1.Your diagnosis?

2.Suggestions for diet and environment.

3.Recommendations for treatment.

Task 2.

A 6-year-old girl. Complains of coughing and wheezing. Born from first normal pregnancy, emergency delivery. Body weight at birth 3400g, length 52cm. Was formula fed from 2 months of age. Had infantile eczema until 1 year of age. Can't tolerate chocolate, strawberries, eggs (skin rash). Family history: mother has recurrent urticaria, father has peptic ulcer. At the age of 3 and 4 years, in May, in the countryside, the girl had episodes of suffocation, which were self-limited when she

moved to the city. The real attack occurred when she ate chocolate. General: Condition is moderate. Skin was pale, blue under the eyes. On cheeks, behind ears, in natural folds of hands and feet dryness, peeling, scabbing. Tongue "geographical", acne in the corners of the mouth. Breathing is whistling, audible at a distance. Exhalation lengthened. Breath rate was 28 per minute. Above the lungs percussion sound with boxy tinge, auscultatively: mass of dry rales over the entire surface of the lungs. Heart sounds are muffled. The heart rate is 82 beats per minute. The abdomen is soft and painless. The liver is +1 cm from under the rib edge. The spleen was not palpable. Stools were daily, regular. General blood count: Íb - 118 g/l, RL - 4.3×1012/l, LL - 5.8×109/l, B/L - 1%, C - 48%, E - 14%, L - 29%, M - 8%, SLE - 3 mm/hr. Chest roentgenogram: lung fields with increased transparency, bronchopulmonary pattern enhancement in the root zones, no focal shadows.

Questions:

1. What is your diagnosis?
2. What investigations are needed to confirm the diagnosis?
3. recommendations for treatment.

Task 3.

A 10-year-old boy was admitted to the children's pulmonology department with complaints of painful coughing, intensifying at night and in the morning. He had been ill for 1.5 months, when after working with magazines and books a barking cough and hoarseness of voice appeared. He was treated as an out-patient: bromhexine, ATS. No positive dynamics of therapy was noticed. He is seen by an allergist for atopic dermatitis. Since the age of 8 he has had episodes of obstructive bronchitis 2-3 times a year. Mother suffers from pollinosis (allergic rhinoconjunctivitis). Objektivno: Condition of the child is moderately severe. The skin is pale, breathing through the nose is difficult. Auscultatively, the lungs are hard breathing, on forced exhalation dry whistling rales are heard on both sides, exhalation is prolonged, BP 24 per min. The heart tones are clear and rhythmic, heart rate 88 per minute. The abdomen was accessible to palpation, soft. The stools are regular and regular. He urinated freely.

Questions:

1. What disease can be thought of?
2. What additional examinations are needed to confirm the diagnosis?
3. Prescribe an emergency treatment.

GUIDELINES FOR ORGANISING AND CARRYING OUT COURSEWORK

The time allocated for independent work is used by students for:

- Studying the topics (issues) for independent study;
- problem solution;
- research and creative assignments;
- preparing thematic reports, presentations;
- completing practical assignments;
- designing information and demonstration materials (stands, posters, charts, tables, newspapers, etc.);
- compilation of thematic selection of literary sources, internet sources;

- Duty in health care organisations;
- compiling a review of scientific literature on the issues of the class.
- preparation of lectures, talks with patients on the prevention of respiratory diseases and the formation of a healthy lifestyle;

The main methods of organizing independent work

- making a report;
- Exploring topics and problems that are not covered in the classroom;
- preparation and participation in active forms of learning.

List of SIW tasks:

- study of clinical guidelines (examination and treatment protocols for children) with allergic rhinitis; bronchial asthma.
- drafting situational tasks on the topic of the class:
- Year-round allergic rhinitis, exacerbation period
- Year-round allergic rhinitis, remission period
- Seasonal allergic rhinitis, exacerbation period
- Seasonal allergic rhinitis, remission period
- Bronchial asthma mild intermittent, remission period
- bronchial asthma mild intermittent, exacerbation period
- bronchial asthma light persistent, remission period
- bronchial asthma mild persistent, relapsing phase
- asthma moderate to severe persistent, remission period

asthma moderately severe persistent, relapsing phase

- Bronchial asthma, severe persistent, relapsing phase

Write prescriptions for the main groups of drugs used in pulmonology:

- To carry out a research paper on the topic of the class.

GUIDELINES ON THE ORGANISATION AND IMPLEMENTATION OF THE GSSS

The recommended forms of GSSS organisation are:

1. preparation of abstracts on proposed topics;
2. solving case studies on the theme of the class; 3.
3. tests on the subject of the class.

List of SIWtasks:

1. Prepare an essay on the proposed topic:

- Cortagener's syndrome.
- Congenital malformations of the respiratory system
- Screening-diagnosis of hereditary and congenital abnormalities. 2.

2.Solve situational problems.

Task 1 A 6-year-old child, parents have complained about persistent nasal breathing problems for the last year. His condition improves in summer and persists when it is cold. The history of atopic dermatitis in the first year of life is known, after one year the skin cleared up. Since the age of 3 years, the child has been attending nursery school and has respiratory infections almost monthly. A cat lives in the house, the child sleeps on a feather pillow and his room is carpeted. Family

history of allergies: mother has atopic dermatitis. Objective: Condition is moderately severe, nasal breathing is difficult, breathing through the mouth, transverse fold at the bridge of the nose, periorbital cyanosis. Pharyngeal mucosa swollen, thick mucus dripping down the posterior pharyngeal wall, lymphoid hyperplasia of the posterior pharyngeal wall noted. Rhinoscopy reveals pronounced swelling of the mucosa, especially of the nasal cavity floor, the mucosa is marbled with cyanotic tinge, secretions are thick and vitreous. On auscultation, vesicular breathing, no rales, BP 22 per minute. Cardiac tones are rhythmic, clear, heart rate 78 per minute. The abdomen is soft and painless on palpation.

Questions:

1.Your preliminary diagnosis?

2.What further investigations need to be done?

3.Prescribe treatment.

Task 2

A 10 year old girl. Complaints: long runny nose for 3-4 years, serous discharge during daytime.

During the day: serous discharge, paroxysmal sneezing fits, stuffy nose at night, frequent use of vasoconstrictors.

Past medical history: frequent respiratory infections up to the age of 3, from the age of 4, diagnosed by an ENT specialist with adenoiditis, at the age of 7 she had an adenotomy, without any positive dynamics.

A paediatrician examined her and recommended a course of bronhomunal.

Questions:

1.Preliminary diagnosis?

2.Examination plan?

3.Recommended therapy?

Task 3

A 12 year old boy. Complaints: frequent attacks of suffocation, shortness of breath in PE classes after running. Past medical history: up to 1 year old - severe atopic dermatitis. From 3 years old - allergic rhinitis, from 6 years old - bronchial asthma, in 6-7 years old - courses of basic therapy (Intal), from 9 years old - more frequent attacks. Last course of steroids was carried out 3 months ago. Over the last 2 months she used salbutamol 3-4 times daily.

Questions:

1.Preliminary diagnosis?

2.Examination plan?

3.Recommended therapy?

Task 4.

A boy 14 years old. He has been suffering from bronchial asthma for 6 years. Has attacks of choking no more than once a week, no nocturnal symptoms. Daily variability of PEF or SPH1 within 20-30%. Assess the severity of bronchial asthma and make a detailed clinical diagnosis.

3.Test control.

1. A distinction is made between the following forms of bronchial asthma in children:

1. atopic (allergic);

2. non-atopic (pseudoallergic);
3. infectious - allergic;
4. mixed.

2. Specify the means of baseline therapy for bronchial asthma:
1. antihistamines;
2. nedocromil sodium.
3. eufylline;
4. sodium cromoglycate;
5. inhaled corticosteroids;
6. specific immunotherapy.

3. State the clinical signs that are not typical of bronchial asthma in children:
1. onset of symptoms in the neonatal period;
2. wheezing resistant to bronchodilators;
3. wheezing associated with food intake or vomiting;
4. sudden onset with cough and asphyxia;
5. stridor, steatorrhea;
6. all of the above.

4. Prolonged β-2-agonists include:
1. astmopent;
2. salmeterol (serevent);
3. salbutamol;
4. clenbuterol (spirovent);
5. berodual;
6. formoterol (foradyl).

5. Type 1 allergic reactions are characterized by:
1. involvement of Ig A, Ig M in them;
2. Involvement of Ig E;
3. target cells - basophils, mast cells (mastocytes);
4. effector cell - sensitised T lymphocyte;
5. anaphylactic shock, urticaria, bronchial asthma;
6. serum sickness, allergic alveolitis, JRA.

6. expiratory dyspnea is seen in:
1. acute simple bronchitis;
2. croup syndrome;
3. an attack of bronchial asthma;
4. pharyngeal abscess;
5. acute destructive bronchitis.

7. Name the M-cholinolytic drugs used in the treatment of patients with bronchial asthma:
1. nedocromil sodium;
2. histaglobulin;
3. ipratropium bromide.

8. Picfloumetry is used for:
1. examination of children under 5 years of age;
2. examination of children over 5-6 years of age;

3. determination of vital capacity of lungs;
4. determination of forced expiratory volume;
5. determination of carbon dioxide content in exhaled air.

9. Pseudoallergic reactions are characterized by

1. increase in total serum Ig E;
2. presence of specific Ig E in serum;
3. Relationship between dose of allergen and severity of reaction.

10. Name the leukotriene inhibitor drugs for the treatment of patients with bronchial asthma:

1. glyciram;
2. etimizole;
3. zafirlukast (acolate);
4. ketotifen (zaditen);
5. montelukast (singular).

11. A 3 year old child has a history of repeated bronchitis, pneumonia. The child is retarded in physical development, skin colour is pale, fingers in the form of "drumsticks". Auscultatory rales with differential rales. The co-program showed neutral fat. What is your presumptive diagnosis?

1. bronchial asthma;
2. bronchopulmonary dysplasia;
3. chronic bronchitis;
4. tuberculosis;
5. cystic fibrosis.

12. State the signs that characterise the third degree of respiratory failure:

1. the ratio of pulse to respiration at rest is 2-1.5:1;
2. HPC: HD = 4-3.5:1;
3. RaO2 - 65-80 mmHg, RaO2 - 40-50 mmHg;
4. RaO2 - 60-65 mmHg, RAS2 - 50-70 mmHg;
5. Blood pH 7.35;
6. inhalation of 60% oxygen does not change respiratory status.

13. The "protected" penicillins include:

1. ampicillin;
2. oxacillin;
3. amoxicillin;
4. augmentin;
5. amoxiclav.

14. A one-year-old child has a body weight of 7 kg, a persistent cough and a history of pneumonia several times. The stools are profuse and greasy. What is your probable diagnosis?

1. chronic pneumonia;
2. cystic fibrosis;
3. celiac disease.

15. When parasympathetic nerves are irritated, the bronchial muscles:

1. contract;
2. relax.

16. State the mechanism of action of beta-2-agonists:

1. stabilise mast cells;

2. cause bronchial smooth muscle to relax;

3. affect bronchial hyperresponsiveness;

4. all of the above.

Answers*; 1-1,2; 2-2,4,5; 3-6; 4-2,4,6; 5-2,3,5; 6-3,5; 7-3; 8-2,4; 9-3; 10-3,5; 11-5; 12-1,4,6; 13-4,5; 14-2; 15-1; 16-4.*

Forms of SIWperformance monitoring:

1. checking and evaluating an essay on a given topic;
2. checking and evaluating the correctness of solving situational tasks.
3. test control

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