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: Urinary tract infection in children.

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 diseases of the urinary system 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:

-the anatomical and physiological features of the urinary system that predispose to kidney disease;

- modern classification of kidney diseases;
- etiology of microbial inflammatory diseases of the kidneys;
- pathogenesis of the main clinical syndromes in microbial-inflammatory kidney diseases;
- required volume of laboratory tests (clinical, biochemical, immunological, bacteriological) in urinary system lesions;
- instrumental methods of investigation of the urinary system (ultrasound, X-rays, renoradiography and other methods);
- drugs used in the treatment of microbial inflammatory diseases of the kidneys;
- phytotherapy for microbial inflammatory kidney diseases;
- dispensary care for children with microbial inflammatory kidney diseases.

be able to:

- by taking a careful history, collecting information from developmental history, establish a link between the observed changes and the occurrence of kidney disease;
- objectively assess the state of the urinary system and identify the main symptoms of its damage;
- make a plan of examination of a patient with microbial-inflammatory kidney disease;

- interpret the results of the examination, establish their natural correlation;
- prescribe adequate treatment for a patient with microbial inflammatory kidney disease.

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 diseases of the urinary system 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, urine test kits, renal ultrasound findings, tonometers, scales, stadiometer, assignment bank for independent work; selection of case studies from the inpatient units.

CONTROL QUESTIONS FROM RELATED DISCIPLINES

1. "Anatomy".
- Anatomical and physiological features of the urinary system in children.
2. "Normal Physiology", "Pathological Physiology".
- Types of immunological reactions.
- Neurohumoral regulation of the kidneys.
- Pathophysiological mechanisms of the main pathological syndromes (urinary, pain, intoxication, anemic, etc.) in microbial-inflammatory kidney diseases.
3. "Pharmacology".
- Mechanisms of pharmacological action of antibiotics, uroseptics.

CONTROL QUESTIONS ON THE TOPIC OF THE CLASS

1. Urinary tract infection in children. Concept of urinary infection and urinary tract infection. Etiology and routes of infection. Definition of bacteriuria.
2. Pyelonephritis: definition, etiology, pathogenesis, classification.
3. Pyelonephritis: clinic, diagnosis, diagnostic criteria. Features of clinical manifestations in young children.
4. Treatment of patients with pyelonephritis. Start and contraciliation therapy. Indications and contraindications for countercurrent therapy.
5. Cystitis: definition, clinic, diagnosis, treatment principles.
6. Dispensary care for children with microbial inflammatory diseases of the urinary system.

PROCESS OF THE STUDY

Theoretical part

Diseases of the urinary system in children are one of the current problems of paediatrics, since the frequency of this pathology is increasing, and untimely diagnosis and inadequate therapy can lead to the development of renal failure.

Microbial inflammatory renal diseases have a specific clinical picture in young children, which must be taken into account in differential diagnosis.

The above dictates the need for every physician to be aware of this pathology[5]

Practical part.

Students are instructed, attention is paid to the rules of the internal schedule, the peculiarities of work in the pediatric department number 5 (profile nephrological). 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,
- making a preliminary diagnosis and drawing up an examination plan,
- interpretation of the results of laboratory and instrumental methods of investigation,
- Formulation of the final clinical diagnosis,
- Formulation of a treatment and rehabilitation plan,
- Writing prescriptions for medications.

Control of assimilation of the topic

1. Demonstration of case studies with analysis of clinical cases:

- acute cystitis
- chronic cystitis
- Acute pyelonephritis, period of active manifestations
- Acute pyelonephritis, reversal period
- Chronic pyelonephritis, acute exacerbation period
- Chronic pyelonephritis, period of incomplete remission
- Chronic pyelonephritis, period of complete remission

2.Decipher the proposed urine tests in children.

3.Solution of situational tasks

Task №1. A 5-year-old girl was admitted to the nephrology department for a routine examination. Main complaints on admission: frequent, intermittent difficult and painful urination, pain in the lower abdomen, intensifying on movement.

The child from the first pregnancy, during which the mother continued to work at a chemical plant. Pregnancy lasted 7-9 weeks and threatened to be terminated. She was born at term with a body weight of 2500g and a length of 47cm. The child was constantly retarded in physical development. From early age till examination she was prone to constipation, periodically experienced discomfort in the rectum. At the age of three, she underwent surgery for a short frenulum.

During the last year she had had five acute respiratory infections and subfebrile fever for a long time. Tuberculosis was excluded by phthisiatric examination. On objective examination, physical development corresponds to the average indicators for a three-year-old child, anomalies of the structure of the

auricles, micrognathia, malocclusion and defects of enamel are noted. X-ray of the spine showed spina bifida.

What is your diagnosis? What is your examination plan?

Task №2. A 12-year-old girl was admitted to the hospital by the referral of an emergency physician.

She had been sick for the second day. She had an acute illness with body temperature 39.20 C and chills. A local pediatrician diagnosed her with flu. Next day her condition worsened: pains in the lumbar region, painfulness while urinating, weakness.

Heredity: mother was diagnosed with chronic cystitis, father suffered from hypertension since the age of 42. The girl was born from a pregnancy with toxemia in the first half, with a weight of 3200g, length 50 cm. She was breastfed until 6 months of age. Grew and developed without any peculiarities, had rare acute respiratory infections.

On physical examination, the condition was of average severity, body temperature 38.70 degrees, lethargic, pronounced symptoms of intoxication, satisfactory nutrition, physical and sexual development corresponding to age. The skin was dry, the tonsils were hypertrophied to degree II-III. The pulse rate was 124 bpm, BP 140/190 mm Hg, heart tones were moderately muffled. The abdomen is soft, painless, and the liver is palpable at the edge of the rib arch. The lumbar tapping symptom is positive on both sides, more on the left side.

What is your diagnosis? Specify the plan of observation and treatment.

Task №3.

A 10-year-old girl was admitted to the ward with complaints of pains in the abdomen, in the right lumbar region, fever up to 38.50 degrees for 3 days, weakness, fatigability, decreased appetite, frequent urination, headache. On objective examination: pale skin, dry skin, pastosity of the face, painfulness of the right ureteral points and the right rib-vertebral point.

Urinalysis: protein 0.127 g/l, leukocytes completely covering all fields of vision, single erythrocytes, bacteria +++, oxalate salts in large quantity.

State the diagnosis. Prescribe additional methods of examination. What is the etiology of the disease? Make a differential diagnosis. Which sexes are more often affected by IBD? Explain why.

GUIDELINES FOR ORGANIZING AND CARRYING OUT THE CSR

Students use the time allotted for independent work for:

- working through the topics (issues) assigned for independent study;
- problem solutions;
- carrying out 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 organizations;

- making 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;
- drawing up situational problems on the topic of the class.

The main methods of organizing independent work:

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

List of tasks of the SIW

:

- study of clinical recommendations (protocols of examination and treatment of children) with acute cystitis; acute pyelonephritis; chronic pyelonephritis.
- solving situational problems (from the task bank for independent work);
- making up situational tasks on the topic of the class:
- acute cystitis
- chronic cystitis
- Acute pyelonephritis, period of active symptoms
- acute pyelonephritis, reversal period
- Chronic pyelonephritis, acute stage
- Chronic pyelonephritis, period of incomplete remission
- Chronic pyelonephritis, in complete remission

Write out prescriptions for major groups of drugs used in pulmonology:

performance of research work on the topic of the class.

GUIDELINES ON THE ORGANISATION AND IMPLEMENTATION OF THE SIW

The recommended forms of SIW organisation are:

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

List of GSSS tasks:

1. Prepare an abstract on the proposed topic:

- Renal tubular acidosis (Albright syndrome)
- De-Tony-Debre-Fanconi syndrome
- Dysmetabolic nephropathies in children

2.Solution of case studies

<u>Task № 1</u>.

A boy, 8 years old, went to the clinic with complaints of abdominal pain, malaise, decreased appetite, infrequent urination, slight swelling of the face, change in the color of urine (cloudy). According to mom's words, the boy became pale in the last month, he has nocturnal urinary incontinence. In the last week, his body temperature increased to 380°C. Objective examination revealed puffiness of the face, pallor of the skin, decreased nutrition, muffled heart tones. Arterial pressure - 75/40 mm Hg. Painfulness of the upper and lower ureteric points is noted. Positive Pasternatzky's symptom, more on the left side.

Blood tests: Hb - 100 g/l, leukocytes - 11x109/l, left shift of the formula, sedimentation rate 19 mm/hour.

Urinalysis: no protein, plenty of leukocytes, single cells of renal epithelium in the preparation.

Bacteriological urine culture: microbial count of 3 million CFU in 1 ml of urine, culture yielded growth of Escherichia coli.

Ultrasonic examination of the urinary system revealed the left urinary tract enlargement: pelvis up to 30 m, all the calyx groups up to 10 mm.

What is the preliminary diagnosis? Do you need additional diagnostic tests? Prescribe treatment. Further therapeutic tactics. List the known causes of congenital hydronephrosis.

Task № 2.

A 9-year-old girl was admitted to the department for pain in the lumbar region and frequent urination. A child of the first pregnancy with toxemia in the first half. Delivery at the age of 38 weeks. Birth weight 3500 g and length 52 cm. The period of neonativity had no peculiarities. Her childhood infections included chickenpox and rubella. Acute respiratory infections - often. Allergoanaemnesis was not aggravated.

Her disease was preceded by hypothermia. The next day headache, adynamia, pain in the left abdomen and lumbar region, temperature increased to 39°C. No catarrhal phenomena were noted. For the next 4 days, high fever continued, pollakiuria was observed, urine was cloudy.

On admission to the hospital, her condition was moderately severe. The skin was pale, there were no edemas, and the body temperature was 38°C. Pasternatsky's symptom was positive on both sides, more on the left side. Palpation of the left kidney was painful. Frequent urination was noted.

General blood count: er.- 4.5x10 12 /l, Hv -140 g/l, leukemia.- L - 10.5x10 9 /l, b/l - 10%, c - 60%, l - 22%, m - 8%, sed rate - 28 mm/hour.

General urinalysis: reaction - neutral, protein - 0.09 g/l, leukocytes - all over the view, erythrocytes 1 in p/z, salts - oxalates, bacteria - a lot.

Biochemical blood test: total protein - 72.0 g/l, CRP - +++.

Ultrasonic examination of the kidneys: the kidneys were located correctly, the left kidney was 107x42x13 mm, the right kidney was 94x37x13 mm. Echo-signal from the collecting system was changed on both sides, more on the left side, dilated. Doubling of the left kidney was suspected.

Urine culture: E. coli in the amount of 100,000 microbial bodies/ml was isolated.

QUESTIONS:

1. Your diagnosis.
2. Make a plan for further evaluation of your child.
3. What is your doctor's tactic for managing your child?

Task №3 Examine the patient with pyelonephritis. To do this:

a) Analyze the medical history, establish a link between the findings and the possibility of pyelonephritis;

b) assess the urinary system, establish the severity of the condition;

c) with which diseases a differential diagnosis should be made, identify the main diagnostic criteria. Justify your choice.

Task №4 Examine the newly admitted child. To do this:

a) Gather the anamnesis, pay special attention to the connection of this disease with the previous ones, the nature of the complaints, heredity;

b) perform an objective examination of the patient, establishing the leading clinical syndrome;

c) formulate a preliminary diagnosis based on the history and objective data;

d) make a plan of examination and treatment, justify your prescriptions.

3.Test control

1.Which of the following methods should be used to begin the examination of a newborn infant with suspected renal pathology?

1. Urography
2. Renal ultrasound
3. Scintigraphy
4. Computed tomography

2. 3 weeks after sore throat, a 10-year-old boy presents with fatigue, back pain and headaches, shortness of breath, vomiting, and decreased urine output. What is the most likely diagnosis?

1. Metabolic nephropathy
2. Urolithiasis
3. Acute glomerulonephritis
4. Heart failure

3 The following signs are characteristic of nephrotic syndrome:

1. Significant proteinuria, hypoproteinemia, hypercholesterolemia
2. Hyponatremia, hypokalemia
3. azotemia, immunodeficiency

4. Which of the following diseases belongs to the group of metabolic tubular syndromes?

1. Polycystic kidney disease
2. Glomerulonephritis
3. Renal aminoaciduria

5. The indication for a renal biopsy is:

1. Torpid course of nephropathy
2. Suspicion of renal dysembryogenesis
3. Lack of effect of the current therapy
4. All of the above

6. A healthy child excretes in a 24-hour period:

1. 1 to 2 million white blood cells, up to 1 million red blood cells
2. 2 to 4 million leucocytes
3. 1 to 2 million red blood cells 7.

7. Edema in renal patients may be due to:

1. Decreased glomerular filtration
2. Loss of protein in the urine
3. Impaired vascular permeability

4. All of the above.

8. Protein in primary urine:

1. No
2. Contains up to 30 mg%

9. In which urine reaction hyaline cylinders are more often found:

1. Acidic
2. alkaline.

10. In the standing position the kidneys are normally displaced by:

1. 0.5 vertebrae
2. 1 vertebra
3. 1.5 vertebra

Answers:

1 - 2; 2 - 3; 3 - 1; 4 - 3; 5 - 4; 6 - 1; 7 - 4; 8 - 2; 9 - 1; 10 - 2.

Forms of control of GSSS performance:

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

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