

GUIDELINES
for practical classes
for students

Educational discipline: Pediatrics, including medical practice (professional training) childhood diseases

Field of knowledge: 22 "Health care"

Specialty: 222 "Medicine"

Department of Pediatrics No 2

Approved at the meeting of the Department of Pediatrics No. 2 on August 22, 2024, protocol No. 1

Considered and approved by: Cyclic methodological commission for pediatric disciplines

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Subject of the lesson:
"Rickets. Infant tetany. Hypervitaminosis D"

Competencies:

Ability to collect complaints, history of life and disease and analyze clinical data in children with rickets, infant tetany, hypervitaminosis D.

The ability to distinguish and identify leading clinical symptoms and syndromes in rickets, infant tetany, hypervitaminosis D in children.

The ability to determine the necessary list of laboratory and instrumental studies for the diagnosis of rickets and to evaluate their results.

The ability to determine the necessary list of laboratory and instrumental studies for the diagnosis of infant tetany, hypervitaminosis D and to evaluate their results.

The ability to establish a preliminary and clinical diagnosis of rickets, infant tetany, hypervitaminosis D.

Ability to determine the principles and nature of treatment of rickets, infant tetany in children, hypervitaminosis D and prevention of these diseases.

Ability to diagnose emergency conditions.

Ability to determine tactics and provide emergency medical care.

Ability to abstract thinking, analysis.

The ability to master and process modern knowledge.

Understanding the peculiarities of working with children of different ages.

The ability to make decisions when studying the discipline "Pediatrics, including medical practice (professional training) childhood diseases"

The purpose of practical class

Formation of students' professional competencies for achieving program learning outcomes by controlling the initial level of knowledge in the process of discussing theoretical issues and testing, performing practical tasks and conducting control of the final level of training in solving situational problems on diagnosis, treatment and prevention of rickets, infant tetany and hypervitaminosis D in children.

Equipment: PC with appropriate information support, reference materials, methodological recommendations, extracts from medical histories, a set of laboratory test results, manikin.

Lesson plan and organizational structure

Stage name	Description of the stage	Levels of assimilation	Timing
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Preparatory	- Organizational issues - Learning motivation: The prevalence of rickets is increasing worldwide. Possible reasons include recommendations for children to use sunscreen when outside and the tendency for children to spend more time indoors watching TV or playing electronic games instead of playing outside. Infant tetany and hypervitaminosis D may develop during treatment of rickets. - Control of the initial level of knowledge - test control and oral survey. Examples of test tasks: 1. Which of the following symptoms is characteristic of a mild course of rickets in children: A. Hepatosplenomegaly. B. Restlessness, sleep disturbance C. Hypercalcemia D. Leukocytosis. E. Increasing the level of ALT, AsT. 2. Principles of prescribing vitamin D for postnatal rickets prevention: A. Dose of vitamin D - 400 IU per day, daily for up to 12 months. B. Prevention is carried out exclusively in the winter period. C. Dose of vitamin D - 500-1000 IU daily. D. Appointment of vitamin D from 5 weeks of life. E. All of the above 3. The main functions of parathyroid hormone include: A. Lowers the level of calcium in the blood B. Increases calcium deposition in bones C. Stimulates bone resorption D. Reduces phosphate excretion with urine E. Increases the deposition of calcium in the bones 4. What drugs contribute to the violation of calcium-phosphorus metabolism: A. Antihistamines. B. Anticonvulsants. C. Antibiotics.	Introductory	25 min
		Reproductive	

	D. Antiviral. E. Cardiac glycosides 5. The principles of rickets treatment are as follows: A. The therapeutic dose of vitamin D is 2000 IU per day B. The therapeutic dose of vitamin D is 5000-10000 IU per day. C. The duration of the appointment of vitamin D is 2-3 weeks. D. The therapeutic dose of vitamin D is 500-1000 IU per day E. Appointment of anticonvulsant drugs		
Main	Formation of professional competences: - demonstration of a thematic patient or review of extracts from medical histories of patients with rickets, infant tetany, hypervitaminosis D; - evaluation of the results of laboratory studies; - on the basis of anamnesis, data of a clinical examination and the results of laboratory studies, the establishment of a preliminary clinical diagnosis - determining of factors and pathogenetic mechanisms of disease development; - appointment of treatment and management of the disease;	Introductive Reproductive Creative Reproductive Creative Reproductive Creative	125 min
Final	Control of the final level of preparation (Clinical cases): Task 1. The child is 9 months old, delivered by ambulance with the mother's complaints of convulsions with loss of consciousness. The convulsions started in 20 minutes. therefore, when, after prolonged crying, twitching of the facial muscles appeared, then the convulsions quickly spread to the limbs, and cyanosis appeared. It is known from the anamnesis that the child was born prematurely, the mother is 17 years old, the living conditions are unsatisfactory, he is fed with cow's milk. On examination: the skin is pale, frontal and parietal humps are pronounced,	Creative	30 min

there are no teeth, the lower aperture of the chest is widened, palpable rib "rosaries", an O-shaped curvature of the lower extremities is observed. During auscultation – weakening of heart sounds, systolic murmur. Puerile breathing in the lungs. The abdomen is soft, the liver protrudes from under the edge of the costal arch by 3 cm. Kernig and Brudzinsky reflexes are negative. Your diagnosis? Emergency aid

Answer standard:

Vitamin D-deficient rickets, subacute course, severe, infant tetany, eclampsia. Seduxen 0.5%-0.1 ml/kg body weight IV, magnesium sulfate 25%-0.2 ml/kg body weight IV. Calcium gluconate 10% 1-1.5 ml/kg per day IV slowly in 2-3 doses. Treatment with vitamin D 3-5 days after the appointment of calcium preparations.

Task 2. The child is 3 months old, born prematurely at 35 weeks, one of twins, is being artificially fed with the "Nan-1" formula. Prevention of rickets was not carried out. The mother complains of restlessness, sleep disturbances, increased sweating. On examination, the general condition is slightly disturbed, the skin is pale, the back of the head is bald, it is flat, asymmetric, the bones of the skull are slightly softened, there are a small number of "rosaries" on the ribs. By organs and systems - within the limits of age characteristics. Your diagnosis? Prescribe treatment. What should be monitored for treatment effectiveness?

Answer standard:

Vitamin D-deficient rickets, initial period, mild, acute course. Treatment: Vitamin D – 2000 IU daily for 3 months. Calcium 500 mg per day. The concentration of calcium, phosphorus, alkaline phosphatase in blood serum and the ratio of calcium / creatinine in urine should be determined 4 weeks after the start of therapy. At this point, the level of calcium and phosphorus in the blood serum should normalize, and alkaline phosphatase should begin to decrease. Re-evaluate the response

	to treatment after 3 months, as it may need to be continued. Task 3. The child is 8 months old, the mother complains about the absence of teeth and deformation of the lower limbs, delayed psychomotor development. She was born with a weight of 4000 g, on natural feeding, rickets prevention was not carried out, in 3 months. suffered an acute intestinal infection. On examination, the skin is pale, there are no teeth, the large fontanelle is 3x3 cm in size, the lower aperture of the chest is widened, palpable rib "rosaries", muscle hypotonia, pronounced frontal and parietal humps. An O-shaped curvature of the lower limbs is observed. During auscultation – weakening of heart sounds, systolic murmur. The abdomen is soft, the liver protrudes from under the edge of the costal arch by 3 cm. Your diagnosis? What factors contributed to the development of the disease? Answer standard: Vitamin D-deficient rickets, subacute course severe. Large mass at birth, lack of prophylaxis, transferred acute intestinal infection. General assessment of educational activity		
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Recommended Books

1. Nelson textbook 21th Edition by Robert M. Kliegman, MD, Joseph St. Geme, Nathan J. Blum, Samair S. Shan, Robert C. Tasker, Karen M. Wilson, Richard E. Behrman
Видавництво: Elsevier, 2020.
2. Paediatrics Lecture Notes 10th Edition Jonathan C. Darling, Publisher: Wiley-Blackwell; 10th edition (October 21, 2021)
3. Illustrated Textbook of Paediatrics 6th Edition by Tom Lissauer MB BChir FRCPCH (Editor), Will Carroll MD (Editor) Publisher : Elsevier; 6th edition (September 21, 2021)

Information sources:

1. Rahul Chanchlani R., Nemer p., Sinha R. et al / An Overview of Rickets in Children / Kidney International Reports (2020) 5, 980–990

2. Steven M Schwarz, Jatinder Bhatia / Rickets. [Электронный ресурс] - Medscape (2022).
Режим доступа: <https://emedicine.medscape.com/article/985510-overview>
3. Horacio B Plotkin, Jatinder Bhatia / Bone Mineralization and Related Disorders.
[Электронный ресурс] - Medscape (2024). Режим доступа:
<https://emedicine.medscape.com/article/985766-overview>

Questions for student self-preparation for practical classes

1. Determine the causes and risk factors for the development of rickets
2. Draw a diagram of the metabolism of vitamin D in the body
3. Name the main effects of vitamin D metabolites in the body
4. Draw a diagram of the regulation of phosphorus-calcium metabolism with the participation of vitamin D and body hormones
5. Define the main types of skeletal damage in rickets
6. Define the laboratory criteria for the diagnosis of rickets and the provision of vitamin D.
7. Determine the treatment regimens for rickets depending on the degree of severity
8. Determine the schemes for the prevention of rickets in different contingents of children.
9. Explanation of the pathogenesis of infant tetany
10. Diagnosis of latent and manifest forms of infant tetany
11. Announce the emergency aid algorithm for infant tetany.
10. Name the clinical and laboratory diagnostic criteria, treatment regimens for hypervitaminosis D.

Methodical guidelines have been created a.p. Iemets O.V.