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Discipline: "Urogenital system in pathology".

Discipline code: USP 3222

Name and code of the EP: 6B 10115 "Medicine"

Amount of study hours/credits: 30 hours/ Pere---
Course and semester of study: 3rd year

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Lecture No. 1

- 1. Topic: Pathophysiology of the kidneys. Disorders of the function of glomeruli and tubules
- 2. Objective: understanding the issues of etiology and pathogenesis of renal dysfunction

3. Lecture abstracts:

The kidneys are vital organs. The main purpose of the kidneys is to maintain the constancy of the internal environment (homeostasis) of the body.

The kidneys perform their homeostatic functions and form urine through the processes of filtration of plasma components, reabsorption and secretion, as well as the synthesis of a number of substances.

Violation of filtration can be expressed as its decrease or increase, regardless of the volume of fluid entering the body.

Both renal and extrarenal factors can lead to a decrease in filtration volume. Renal causes of decreased filtration include:

- decrease in the number of functioning glomeruli due to their replacement by fibrous tissue, destructive processes in the kidneys;
- decreased permeability of the filter membrane due to the ingrowth of connective tissue deposition of immune complexes and autoantibodies on it;
 - sclerotic changes in the afferent arterioles and interlobar vessels;
- increased pressure in the cavity of Bowman's capsule due to increased intrarenal pressure due to interstitial edema or obstruction of the tubules and urinary tract.

Extrarenal causes of decreased filtration may include:

- 1) a decrease in systemic blood pressure due to cardiac or vascular failure, blood loss, dehydration; when systolic blood pressure falls below 50 mm Hg, filtration stops completely;
- 2) an increase in the oncotic pressure of blood plasma as a result of an increase in the concentration of proteins, which can occur with increased synthesis (for example, in myeloma), the introduction of protein preparations, or thickening of the blood.

Tubulopathies- these are diseases caused by a violation of the transport functions of the epithelium of the renal tubules due to the absence or qualitative changes of carrier proteins, certain enzymes, receptors for hormones, or dystrophic processes in the tubular wall.

According to etiology, a distinction is made between primary (hereditary) and secondary (acquired) tubulopathies.

Depending on the location of the defect, a distinction is made between proximal and distal tubulopathies.

Glomerular filtration disorders in children are characterized by low renal blood flow and high renal vascular resistance. Phosphate diabetes (hypophosphatemic rickets) is a proximal tubulopathy. The main defect is a decrease in phosphate reabsorption with subsequent hypophosphatemia.

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4. Illustrative material:

- presentation of lecture material;
- posters on the topic of the lesson;
- tables, diagrams.
- **5. Literature:** see Appendix No. 1.

6. Control questions (feedback) :

- 1. What is the etiology and pathogenesis of renal tube and glomerular dysfunction?
- skna.edu.kl 2. What are the clinical manifestations of renal tubular and glomerular dysfunction?
- 3. What is the pathogenesis of hematuria?
 - 4. What is the pathogenesis of proteinuria?

Lecture No. 2

1. Topic: Renal failure

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2. Objective: To understand the issues of etiology and pathogenesis of renal failure

3. Lecture abstracts:

Renal failure is a syndrome that develops as a result of impaired renal blood flow, glomerular filtration, and tubularreabsorption and secretion, as well as the concentration capacity of the kidneys. Renal failure is characterized by hyperazotemia, disturbance of the water-electrolyte balance and acid-base equilibrium. Depending on the rate of occurrence and further development, a distinction is made between acute (it occurs suddenly due to acute, most often reversible kidney damage) and chronic (it develops gradually due to progressive irreversible loss of functioning renal parenchyma) renal failure, complete (all functions are impaired) and incomplete (partial), which is characterized by impairment of only some renal functions.

Renal failure can be latent (or compensated), which is revealed during an water-salt load, and decompensated, which is revealed at rest.

Etiological factors causing renal pathology are very diverse

For educational purposes they are divided into:

- infectious (bacteria, viruses)
- non-infectious (chemical, mechanical, physical)
- biological: (anti-renal antibodies, immune complexes, natural killers and macrophages) By origin, etiological factors are divided into:
- primary (hereditary: mutations of genes that provide kidney function: renal diabetes mellitus, membranopathy, polycystic disease, dysplasia, enzymopathies)

Uremia (urination) - a syndrome of acute or chronic autointoxication, developing with severe renal failure as a result of the retention of nitrogenous metabolites (azotemia) and other toxic substances in the body, disorders of water-salt acid-base and accompanied by Uremia (urination) - a syndrome of acute or chronic autointoxication, developing with toxic substances in the body, disorders of water-salt, acid-base and osmotic homeostasis, accompanied by secondary metabolic and hormonal disorders, general dystrophy tissues and dysfunction of all organs and systems.

Kidney failure in children is a pathological condition in which the kidneys partially or completely fail to perform the excretory function. The severity of the child's condition depends on the form of the disease - acute or chronic. ARF can occur in response to a reduced blood volume (hemorrhage or hypovolemia) or too low blood pressure.

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4. Illustrative material:

- presentation of lecture material;

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5. Literature: see Appendix No. 1.

- tables, diagrams.

 5. Literature: see Appendix No. 1.

 6. Control questions (feedback):

 1. What are the general provisions, types of renal failure, pathogenesis?

 2. What is the classification of renal failure?

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- skina.edu.kl skina.edu.kl 3. What are the etiology, classification, pathogenesis of acute renal failure?

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АО «Южно-Казахстанская медицинская академия»

Department of Pathology and Forensic Medicine

Lecture complex on the subject "Urogenital system in pathology"

63-11-202 5 Page 5of 8

Appendix No. 1 Literature: primary and secondary

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Department of Pathology and Forensic Medicine 63-11-202 5 Page 6of 8 Lecture complex on the subject "Urogenital system in pathology"

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