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Guidelines for conducting a practical lesson with 5th year students of the Faculty of Medicine on the topic:

DIFFERENTIAL DIAGNOSTICS OF BASIC PATHOLOGICAL SYNDROMES IN NEPHROLOGY

(the duration of the lesson is 12 hours, the second lesson is 4 hours)

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Guidelines for conducting a practical lesson with 5th year students of the Faculty of Medicine on the topic:

DIFFERENTIAL DIAGNOSTICS OF MAJOR PATHOLOGICAL SYNDROMES IN NEPHROLOGY.

PURPOSE OF THE LESSON: to increase the level (quality) of knowledge and skills of students in the differential diagnosis of the main pathological syndromes in the nephrological clinic, in particular urinary syndrome (hematuria).

Students should be able to:

1. to be able to identify the main syndromes in diseases of the urinary organs and the key points of the anamnesis, on the basis of complaints, anamnesis and objective status, make a preliminary diagnosis of the presence of kidney disease in a patient;

2. justify the need for additional research;

3. highlight urinary syndrome; to determine the nosological basis of the identified syndrome;

4. to determine the scope of therapeutic assistance (pathogenetic, symptomatic treatment, treatment of complications).

MOTIVATION OF THE TOPIC RELEVANCE.

Identification of the leading syndrome or a set of syndromes is an important section in the diagnosis of various diseases. At this stage, an attempt is made to connect together a number of clinical, laboratory and data obtained using special methods of research, which in the end, on the one hand, allows, to a certain extent, to represent the pathogenesis of the main manifestations of the disease in this patient, on the other hand, to outline the ways of differential diagnostics, i.e. to determine the nosological basis of the identified syndrome. Hematuria (an admixture of blood in the urine) is a frequent, often the first sign of kidney and urinary tract disease, as well as diseases and conditions not associated with kidney damage (acute leukemia, thrombocytopenia, anticoagulant overdose, heavy physical activity, etc.) ...

Determination of the level of training of students. The second level of knowledge: control methods - written survey (20 min.). Students should know the main issues of etiology, pathogenesis, clinical picture and diagnosis of diseases of the kidneys and urinary tract, isolate urinary syndrome, in particular hematuria, determine the type of hematuria. The main drugs used to treat kidney disease, their mechanisms of action; students should be able to - possess propaedeutic skills.

Report of student curators in the chamber. When reporting a patient, students should pay attention to complaints, medical history, and objective examination data. Students should pay special attention to the main syndromes in the supervised patient, carry out differential diagnostics, i.e. to determine the nosological basis of the identified urinary syndrome - hematuria.TYPES OF HEMATURIA

• By intensity, there are macro- and microhematuria. For the occurrence of gross hematuria, 1 ml of blood is sufficient for 1 liter of urine. Microhematuria is diagnosed when there are more than 1000 erythrocytes in 1 ml of urine or more than 5 erythrocytes in the field of vision (under a microscope at high magnification).

• If bleeding is profuse, urine may be the color of scarlet or dark blood. The type of "meat slop" urine acquires in the presence of a large number of erythrocytes, leukocytes, mucus (for example, with OHN). To assess the degree of hematuria, it is necessary to use quantitative methods (analysis according to Nechiporenko, Amburzhe, Kakovsky-Addis).

• By nature, the initial (at the beginning of the act of urination), terminal (at the end of the act of urination) and total hematuria are distinguished.

• The nature of hematuria can be clarified using a three-glass or two-glass test. Total hematuria can be caused by a single or bilateral lesion, which is established only with cystoscopy or a special radiological examination.

• According to clinical features, hematuria is distinguished between recurrent and persistent, painful and painless.

Hematuria with nephropathies (renal hematuria), as a rule, persistent bilateral painless, is often combined with proteinuria, cylindruria, leukocyturia. Nevertheless, the described forms of glomerulonephritis occurring with recurrent isolated pain macrohematuria.

PATHOGENESIS OF HEMATURIA

The pathogenesis of renal hematuria is not completely clear. It is assumed that the involvement of the mesangium is of great importance, as well as damage to the interstitial tissue and epithelium of the convoluted tubules, since the most often significant hematuria is observed in mesangial nephritis and interstitial nephritis. Hematuria can be caused by necrotizing inflammation of the renal arterioles, renal intravascular coagulation, and renal infarction.

Japanese authors have recently shown on a series of electronograms that erythrocytes can penetrate even through the smallest breaks in the BMG, changing their shape.

HEMATURIA NOT ASSOCIATED WITH RENAL PATHOLOGY True gross hematuria should be distinguished from false. In contrast to the true one, false hematuria is caused by the staining of urine red, not by erythrocytes, but by other substances.

• Hemoglobinuria occurs in cases of massive hemolysis (hemolytic anemia, transfusion of incompatible blood, malaria, poisoning with hemolytic poisons - phenol, berthollet's salt, poisonous mushrooms), paroxysmal nocturnal hemoglobinuria, etc.

• Myoglobin appears in the urine during the breakdown of muscle tissue (prolonged crush syndrome, muscle infarction with occlusion of a large artery, alcoholic polymyopathy, etc.); prolonged hyperthermia, especially in combination with convulsions of familial myoglobinuria.

• Uroporphyrinuria is observed in hemochromatosis, porphyria; melaninuria - with melanosarcoma.

• Urine may acquire a red color when you eat certain foods (beets, red berries), red food colors (confectionery, ketchup, tomato paste, etc.), some le, such as phenolphthalein (with an alkaline reaction urine), phenazopyridine.

CLINICALLY SIGNIFICANT HEMATURIA

Renal hematuria is observed in acute glomerulonephritis, chronic glomerulonephritis, as well as in many nephropathies arising from systemic diseases.

Acute ronephritic syndrome is manifested by hematuria, proteinuria (usually moderate), edema, and arterial hypertension. However, at present, most acute nephritis is atypical, and a number of symptoms, including massive hematuria, may be absent. Recurrent acute nephritis syndrome often manifests itself as a mesangioproliferative variant of chronic glomerulonephritis, which differs from acute nephritis in its morphological picture.

One of the most common causes of isolated hematuria is IgA nephropathy, or Berger's disease (focal mesangial nephritis). IgA nephropathy is usually detected in children and adults under 30 years of age, more often in men; manifested by attacks of macrohematuria (less often persistent microhematuria) with dull pain in the lower back, recurring against the background of pharyngitis. Proteinuria is usually minimal. The course of the disease in children is usually benign; in adults, the prognosis is worse.

A similar hematuric IgA-nephritis with an increase in the concentration of IgA in the blood serum is also characteristic of patients with chronic alcoholism. It is detected mainly in persons over 40 years of age against the background of alcoholic liver damage in combination with other systemic manifestations of alcoholism (damage to the pancreas, heart, polyneuropathy). In contrast to Berger's disease, "alcoholic" glomerulonephritis is manifested by persistent painless microhematuria and is more severe - often arterial hypertension joins, renal failure develops faster.

Hematuria is a characteristic sign of interstitial nephritis, including acute medicinal. The cause of hematuria can be a wide variety of drugs, most often sulfonamides, streptomycin, kanamycin, gentamicin, analgesics (phenacetin, analgin), pyrazolidone derivatives (butadione), as well as heavy metal salts.

Several years ago, a special painful variant of hematuric nephropathy was described - lumbalgic-hematuric syndrome, which is observed mainly in young women who use oral estrogen-containing contraceptives, but isolated cases of the disease have been described in men. Clinically, this syndrome is manifested by bouts of intense pain in the lumbar region in combination with hematuria (more often gross hematuria) and often intermittent fever. Attacks are provoked by colds, heavy physical exertion. In the interictal period, pathological changes in the analysis of urine are not noted. There are also no signs of immunological activity. With angiographic examination, changes in the intrarenal arteries can be detected in the form of their partial or complete occlusion, tortuosity, and fibroelastosis.

Predominantly hematuria is manifested by hereditary nephritis with hearing loss and decreased vision (Alport syndrome), the disease has an unfavorable prognosis.

Benign familial recurrent hematuria has a much better prognosis; biopsy often finds unaltered renal tissue, sometimes focal glomerulonephritis.

Bilateral renal hematuria is characteristic of secondary glomerulonephritis in a number of systemic diseases.

• Nephritis with hemorrhagic vasculitis can develop from the very onset of the disease or join a few years after the appearance of skin, articular and abdominal syndromes. Kidney damage in most cases proceeds as hematuric glomerulonephritis (macrohematuria is observed in 40% of cases) with an increase in serum IgA levels and is characterized by a persistent or slowly progressive course. With the development of nephrotic syndrome, the prognosis is much worse.

• Glomerulonephritis in infective endocarditis, which can occur against the background of an extensive clinical picture of the disease (fever, damage to the valvular apparatus of the heart, splenomegaly, anemia), but may also be the first manifestation of the disease, usually occurs with hematuria, sometimes with moderate macrohematuria proteinuria; nephrotic variant of nephritis is less common. In 40-60% of cases of infective endocarditis, kidney infarctions with gross hematuria occur.

• Nephropathy in classical periarteritis nodosa (Kussmaul-Mayer disease) manifests itself a few months after general symptoms - fever, weight loss, muscle-joint pain, asymmetric polyneuritis, and is characterized by microhematuria (in more than half of the cases), moderate proteinuria and malignant arterial hypertension. Macrohematuria with severe lower back pain may manifest itself in a more rare form of nephropathy with periarteritis nodosa - more often it is a rupture of an intrarenal artery aneurysm.

• Microscopic polyangiitis - a form of necrotizing vasculitis with damage to small vessels (capillaries, venules, arterioles). Antibodies to the cytoplasm of neutrophils (antineutrophilic cytoplasmic antibodies) are detected in the blood, reacting with myeloperoxidase of their granules and giving a perinuclear type of fluorescence in the immunofluorescence test. Most often, the skin (purpura), lungs (hemorrhagic alveolitis with hemoptysis up to pulmonary hemorrhage), kidneys are affected. There are also possible gastrointestinal vasculitis, myalgia, peripheral neuritis. The kidneys are affected in 90-100% of cases (urinary and nephrotic syndromes, arterial hypertension are observed; in more than 50% of cases, nephritis acquires a rapidly progressive course). In the renal biopsy, proliferative glomerulonephritis is revealed with foci of necrosis, with an immunofluorescence study - the absence or a small amount of immune deposits (pauci-immupe - "low-immune" glomerulonephritis).

• Kidney damage in Wegener's granulomatosis develops against the background of granulomatous-necrotic lesions of the upper respiratory tract and lungs and is manifested by hematuria (in 25% of cases, macrohematuria) in combination with moderate proteinuria. Arterial hypertension and nephrotic syndrome develop rarely, but already in the first years of the disease, most patients show signs of renal failure.

• Goodpasture's syndrome is characterized by damage to the lungs (hemorrhagic alveolitis with repeated pulmonary hemorrhages) and the addition, usually after a few months, of rapidly progressive glomerulonephritis with massive micro- or gross hematuria.

• Thrombotic microangiopathies are characterized by widespread lesions of small vessels, occurring with hemolytic anemia, intravascular coagulation, thrombocytopenia, hematuria, often with the development of acute renal failure. This group includes many similar diseases - thrombotic thrombocytopenic purpura (Moshkovich syndrome) and hemolytic uremic syndrome.

Despite the fact that the list of nephropathies leading to the appearance of blood in the urine is very large, nevertheless, when hematuria is detected, urological diseases (urolithiasis, tumors and kidney tuberculosis) should be excluded first of all and only after that discuss diagnosis of nephropathy. It should be remembered that even minimal hematuria (less than 10 red blood cells in the field of view of the microscope) can be the first sign of a tumor of the genitourinary system.

DIAGNOSTIC SEARCH FOR HEMATURIA

To exclude urological diseases, it is of great importance to familiarize yourself with the patient's complaints, anamnesis, as well as physical and laboratory examination. Hematuria, which is observed only at the beginning or at the end of the act of urination, is characteristic almost only of urological diseases; the same diseases are more characterized by hematuria, accompanied by severe pain in the lower back, especially paroxysmal. Initial and terminal hematuria is easy to identify with a three-glass test. Detection of blood only in the first portion of urine is typical for diseases of the urethra, only in the last portion - for diseases of the bladder, prostate gland, seminal tubercles. In the presence of total hematuria (in all three portions of urine), the source of bleeding can be both the renal parenchyma and the pelvic-pelvic system or the ureter. It is often useful to conduct an orthostatic test (exercise with physical activity), which consists in obtaining two portions of urine: the first is the morning one, taken immediately after waking up, preferably lying down, before moving to an upright position, and the second is taken through 1-2 hours after the transition to the upright position and a little physical activity (walking, climbing stairs). In both portions, the number of erythrocytes is counted. A significant increase in hematuria is characteristic of nephroptosis, urolithiasis. For renal hematuria, the presence of erythrocyte casts in the sediment is characteristic. It is assumed that the cylinders can be destroyed during centrifugation, therefore, it is proposed to isolate the urine sediment not by centrifugation, but by filtration through fine-pored filters.

For a long time, the question of the value of unchanged and changed erythrocytes in urinary sediment has been discussed. In recent decades, the predominance of certain erythrocytes has not been given diagnostic value. Since the end of the 70s, the method of phase contrast microscopy has been used in the study of erythrocytes of urinary sediment. It has been shown that erythrocytes in urological diseases differ significantly from erythrocytes in kidney diseases. Erythrocytes of glomerular origin look markedly deformed as a result of their passage through the basement membrane of the glomeruli and further through liquid media with sharp changes in pH, osmolarity and electrolyte composition of urine in various parts of the renal tubules. The presence of more than 70% of "dysmorphic" erythrocytes in the urine sediment indicates their glomerular origin. When bleeding from damaged vessels in patients with urological diseases, erythrocytes entering the urine retain the size and shape inherent in normal erythrocytes ("unchanged" erythrocytes). This method can be the primary test of differential diagnosis, which determines the direction of further thorough urological examination.

Of particular importance for excluding urological pathology is instrumental and X-ray radiological examination: cystoscopy with catheterization of the ureters and separate urine collection, ultrasound of the kidneys, excretory urography (cheerfully lying and standing to exclude pathological mobility of the kidney), if necessary, retrograde pyelography, CT, selective angiography. Recently, radioisotope angiography and renoscintigraphy with radioactive Tc99 have been used. These methods are simpler and safer, they can reveal local disorders of hemo- and urodynamics characteristic of unilateral hematuria in renal venous hypertension, renal vein thrombosis, fornical bleeding.

About 15% of hematuria are caused by tumors of the genitourinary tract. In 60% of cases, these are bladder tumors, which can only be accompanied by painless hematuria; the diagnosis is clarified by cystoscopy. Approximately 20% of urinary tract tumors are renal parenchymal cancer (dull back pain, fever, anemia or erythrocytosis, hypercalcemia), sometimes with paraneoplastic reactions, including membranous nephropathy; to confirm the diagnosis, it is necessary to perform intravenous urography and angiography.

One of the most common causes of hematuria is urolithiasis. A typical clinical picture includes a sharp paroxysmal low back pain radiating to the groin area, followed by gross hematuria. About 90% of kidney stones contain calcium and can be detected with an overview of the kidney area.

Hematuria in combination with leukocyturia and moderate proteinuria (usually up to 1 g / l) is often found in nonspecific inflammatory diseases of the urinary system. Microhematuria in chronic pyelonephritis is caused by damage to the interstitial tissue of the kidney. In acute pyelonephritis and chronic exacerbation, episodes of gross hematuria may develop, usually caused by necrosis of the renal papillae, the pathogenesis of which is papillary ischemia (vascular embolization) or their compression by inflammatory infiltrates. Lower urinary tract infection (the number of microbial bodies in 1 ml of urine is at least 10x5) can sometimes cause hematuria; with hematuria, a fungal infection can occur.

Episodes of gross hematuria can be in women with cystitis and urethritis.

In tuberculosis of the urinary system, hematuria, as a rule, is combined with pyuria and minor proteinuria, but sometimes it is isolated. Diagnostics is complicated and requires thorough bacteriological (repeated urine cultures, sediment microscopy), X-ray and ultrasound studies.

Often hematuria is detected with congestive venous hypertension in the kidney, which can be caused by nephroptosis, cicatricial stenosis of the renal vein, renal vein thrombosis, renal venous anomalies, etc. Renal venous hypertension can manifest itself as microhematuria, which is significantly aggravated by physical exertion, in combination with insignificant proteinuria. Macrohematuria in these conditions in most cases is caused by an increase in venous pressure and a breakthrough of a thin septum between the veins and the calyx of the kidney (fornical bleeding).

Hematuria (usually one-sided) is observed in kidney infarction, as well as in renal vein thrombosis. Kidney infarction develops with renal artery embolism or thrombosis, can be observed with infective endocarditis, polyarteritis nodosa. Characterized by low back pain, transient hematuria and proteinuria, and sometimes arterial hypertension. Thrombosis of the renal veins is characterized by pain, massive proteinuria and hematuria with rapid nephrotic syndrome. In acute complete thrombosis, gross hematuria is possible, nephrotic syndrome is often combined with transient renal failure. Chronic thrombosis usually occurs with little or no pain, manifested by microhematuria and nephrotic syndrome. For precise localization of thrombosis, inferior venocavagraphy is used in combination with renal venography and arteriography. Recently, in all these situations, Doppler ultrasound, including with color scanning, has been increasingly used for diagnostic purposes.

Conducting a lesson in a thematic classroom. Analysis of the features of etiology, pathogenesis, clinic, diagnosis, treatment of a particular patient. Students should pay special attention to the main syndromes in the supervised patient, carry out differential diagnostics, i.e. to determine the nosological basis of the identified urinary syndrome - hematuria.

Indicate the main methods of non-drug exposure (change in lifestyle, nutrition, rejection of bad habits, exercise therapy). The main groups of drugs and their mechanisms of action, the main indications and contraindications for use and the rationale for choosing a specific drug from pharmacological groups.

The final part of the lesson: control of the acquired knowledge - solutions of situational tasks without possible options for correct answers.

Summary.