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"North Ossetian State Medical Academy"

of the Ministry of Health of the Russian Federation

(FGBOU VO SOGMA of the Ministry of Health of the Russian Federation)

Department of Internal Medicine No. 3

GUIDELINES FOR PERFORMING INDEPENDENT (EXTRACURRICULAR) WORK) WORKS

on POLYCLINIC THERAPY

on the topic "Chronic pyelonephritis»

the main professional educational programs of higher education – bachelor's degree programs in the specialty 31.05.01 General Medicine, confirmed 31.08.2020.

Vladikavkaz, 2020

Methodological recommendations are intended for extracurricular independent work of students of 5,6 courses (9,10,11,12 semesters) of the Faculty of Medicine

FGBOU VO SOGMA of the Ministry of Health of the Russian Federation

on the discipline " Polyclinic therapy»

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Objectives of the practical lesson:

- control of the initial level of students ' knowledge on test questions;

- analysis of questions that remained unclear after self-preparation for the practical lesson;

- acquisition of skills and abilities to collect complaints, anamnesis, objective research, differential diagnosis in patients with pyelonephritis;

- acquisition of skills and abilities for conducting and interpreting general urinalysis, Nechiporenko urinalysis, biochemical analyses, radiological, isotopic, and ultrasound examinations of the kidneys;

- control of knowledge and skills, skills acquired by students in a practical lesson.

Self-preparation for a practical lesson

The purpose of self-study: after self-study of the material, the student should know:

- etiopathogenesis and epidemiology of chronic pyelonephritis (CP);

- classification of HP;

- morphological classification (according to WHO);

- clinical and laboratory manifestations of CP;

Must be able to:

- diagnose CP;

- treat HP.

Recommended literature:

Main:

1. Polyclinic therapy: a textbook for students. higher. studies.institutions \ Ed. by B. Ya. Barta. - M.: Publishing Center "Academy", 2017

2. Polyclinic therapy: textbook Storozhakov G. I., Chukaeva I. I., Alexandrov A. A. M.: GEOTAR-Media, 2013

3. Nephrology: (textbook for post-university students. education) / ed. by E. M. Shilov. – Ed. 2-e, ISPR. and extra – M.: GEOTAR-Media, 2008.

4.Lectures on internal diseases, Department of faculty therapy; Ryabov S. I. Nephrology./ A guide for physicians./ - SPb. – 2000.

5.Nephrology: a guide for physicians / (Yu. G. Alyaev, A. V. Amosov, S. O. Androsov, etc.); ed. Tareeva I. E. – (2nd ed., reprint.

6. Ryabov S. I. Nephrology: a guide for doctors-St. Petersburg: Spetslit, 2000.

7. Internal diseases: Textbook in 2 t. / Ed. by A. I. Martynov, N. A. Mukhin, V. S. Moiseev, A. S. Galyavich. - 3rd ed., ispr. - M., GEOTAR-Media, 2005.

8. Hospital therapy: Textbook / V. N. Saperov, I. B. Bashkova, T. N. Markova, V. V. Dubov, O. P. Chepurnaya. Cheboksary: Chuvash Publishing House. un-ta, 2005.

ADDITIONAL

1. Guide to Medicine. Merc Manuel / Edited by R. Berkov: Trans. from English. In 2 vols. - M.: Mir, 1997, Vol. 2.; Journal "Consilum-medicum" for 2000-2007.; 2.www.consilum-medicum.com

. Journal of Nephrology and Urology for 2000-2008.

3. Journal of Nephrology and Dialysis for 2002-2017.

4. Functional state of the kidneys and prediction of cardiovascular risk Russian recommendations Appendix 3 to the journal "Cardiovascular Therapy and Prevention" 2008; 7(6)

Questions for self-training and self-control

1. Define chronic pyelonephritis;

2. The main etiological factors of CP;

3. Pathogenesis;

4. Clinical classification of CP;

5. Pathogenesis of hypertension, edema, and urinary syndrome in nephritis;

6. Formulation of the clinical diagnosis in CP;

7. Treatment of CGN;

8. Dispensary observation of patients with CGN;

9. CGN and pregnancy, contraindications to pregnancy, risk assessment;

10. Indications and contraindications to the spa treatment of CGN.

Information block

PYELONEPHRITIS

Pyelonephritis is one of the most common diseases of the kidneys and urinary tract, which has a serious prognosis in the development of chronic kidney failure, and therefore requires early diagnosis and adequate therapy. On the other hand, the danger of overdiagnosis of chronic pyelonephritis lies not only in the inadequacy of the therapy, which is fraught with the development of dangerous adverse reactions, but also in the fact that once the label of chronic pyelonephritis is glued, it leads the doctor away from the true cause of the disease, delaying the establishment of the correct diagnosis and appropriate treatment.

In order to characterize the functional state of the kidneys, it is proposed to use the following terms.

Chronic kidney disease (CKD) reflects the presence of kidney damage and / or the characteristic of GFR.

CKD criteria:

- Kidney damage ≥ 3 months, with a decrease in

GFR or

- GFR < 60 ml / min/1.73 m2 ≥ 3 months, with

or without kidney damage.

Kidney damage is a structural or functional abnormality on the part of the kidneys. Initially, they can be detected with normal GFR, but over time they can lead to a decrease in it. Markers of kidney damage include deviations from the norm of indicators that characterize kidney function: in the results of a biochemical blood test-the concentration of creatinine(Cr), serum potassium; urine analysis-erythrocyturia, leukocyturia, microalbuminuria(MAU), proteinuria; imaging studies-changes in the calyx-pelvic system, kidney cysts, stones, etc. for ultrasound examination(ultrasound), intravenous urography, computed tomography (CT), etc. All individuals with kidney damage, regardless of their GFR level, are considered to have CKD.

Thus, those with CKD include:

1. all patients with GFR<60 ml / min/1.73 m2 for ≥3 months, regardless of the presence of kidney damage;

2. all patients with kidney damage, regardless of GFR.

3. end-stage chronic renal failure (ESRD) GFR < 15 ml / min/1.73

m2

To assess kidney function, the determination of serum Cr, GFR, and the assessment of albumin (Al) excretion in the urine are used. Evaluation of Al excretion in the urine gives an idea of the state of the glomerular filter and endothelial dysfunction of the renal capillaries.

The most accurate indicator that reflects the functional state of the kidneys is GFR. GFR can be measured using endogenous (inulin) and exogenous filtration markers, calculated by the clearance of endogenous filtration markers (Cr), or by formulas based on the serum level of endogenous markers (Cr, cystatin C). Determination of the clearance of endogenous and exogenous filtration markers . The gold standard for measuring GFR is the clearance of inulin, which is present in a stable concentration in plasma, is physiologically inert, is freely filtered in the glomeruli, is not secreted, reabsorbed, synthesized, or metabolized in the kidneys. Determination of inulin clearance, as well as clearance of exogenous radioactive tags (125I-iotalamate and 99mTc-DTPA) is expensive and difficult to access in routine practice. A number of alternative methods for assessing GFR have been developed. The Rehberg-Tareev test. Measurement of the 24-hour KCr (Rehberg-Tareev test) requires the collection of urine for a certain period of time

Computational methods for estimating GFR and CRr. The formulas for calculating the GFR take into account various effects on the products of the Kr, they are easy to use, validated: their values quite accurately coincide with the values of the reference methods for evaluating the GFR.In adults, the most widely used formula is Cockroft-Gault (Cockroft-Gault)

and the formula obtained in the MDRD (Modification of Diet in Renal Disease Study)

Formula Cockroft-Gault (ml / min)

GFR = 88 • (140-age, years) • body weight, kg

72 * Kr of serum, mmol/l

GFR = 88 • (140-age, years) • body weight, kg for women, the result is multiplied by 0.85

72 * Serum Kr, mg/dl

Formula MDRD (ml / min/1.73 m2 -) - GFR = 186 • (Bovine serum, mg / dl) 1.154 • (age, years) 0.203

for women the result is multiplied by 0.742

for persons of the black race the result is multiplied by 1.210

Excretion of protein in the urine

Normally, the excretion of protein in the urine in adults is 50 mg / day, Al-10 mg / day. Persistent increased protein excretion is usually a marker of kidney damage. In the urine, both filtered proteins (α, -, α2 -, β2-microglobulins, lysozyme) and those formed in the urinary tract (Tamm-Horsfall protein) can be detected. The

excretion of certain types of protein depends on the type of kidney damage. Increased Al excretion is a sensitive marker of kidney damage in DM, glomerular lesions, and hypertension. In the absence of urinary tract infection and fever, increased Al excretion in the urine usually reflects the pathology of the glomerular apparatus of the kidneys.

The rate of Al excretion in the urine increases significantly in an upright position, after physical exertion (FN), with increased protein intake from food, during pregnancy, fever, in patients with urinary tract infection and HF, as well as some other diseases (Table 4).

The prevalence of albuminuria varies depending on age, the presence or absence of DM. For all ages, the incidence of albuminuria is higher in individuals with DM. In the general population, reproducible albuminuria of varying degrees is found approximately

in a quarter of the examined patients, and only in a quarter of people with albuminuria, it is possible to determine its cause (DM, AH).

Diagnostic criteria and classification of chronic kidney disease The classification of CKD is based on the GFR calculated using the MDRD formula and the presence of

kidney damage. The calculation of GFR using the MDRD formula is recommended as a classifying indicator of the functional state of the kidneys, since

- The MDRD formula provides the most reliable estimate of GF
- The MDRD formula provides the most reliable estimate of GFR in adults;

■ This method uses easily accessible parameters (basic demographic data and serum Cr) to calculate GFR; the indicator can be calculated automatically and presented in a laboratory report

Stages of CKD

Stage

CKD Description of GFR

(ml/min/1.73 m2) Kidney

injury with normal or

elevated GFR >90

1

2 Kidney injury with slightly

reduced GFR 60-89

3 Moderate decrease in GFR 30-59

4 Marked decrease in GFR 15-29

5 ESRD < 15 (or dialysis)

Screening of patients for renal impairment

Algorithm for determining kidney function disorders

- Determine the level of serum Kr and calculate

GFR by MDRD. If the estimated GFR is < 60 ml/min/

1.73 m2, repeat the study after 3 months. or earlier.

- In a random portion of urine, determine the Al/Cr ratio. If the Al/Cr ratio is > 17 mg/g in men or >25 mg/g in women, repeat the study after 3 months. or earlier.

- Perform imaging studies to clarify the presence of kidney damage.

- If GFR values < 60 ml / min/1.73 m2 and/or Al / Cr ratio > 17 mg / g in men or >25 mg/g in women persist for at least 3 months:

* CKD is diagnosed

* treatment is indicated in accordance with the recommendations.

- If both studies are negative, they should be repeated annually.

- If the GFR is < 30 ml / min / 1.73 m2 or is rapidly decreasing, or the Al/Cr ratio is >250 mg / g in

men or >355 mg / g in women, the patient should be referred to a nephrologist.

Diagnosis of kidney damage

In patients with CKD, the presence of kidney damage should be evaluated. MAU / proteinuria are sensitive indicators of glomerular kidney disease. To detect other types of CKD, it is necessary to examine the urine sediment (possibly with test strips for red blood cells and white blood cells) and perform imaging studies: ultrasound, intravenous urography, CT, MRI, radioisotope renography. General urinalysis and kidney ultrasound are useful non-invasive methods for determining kidney damage.

Definition of the concept.

Pyelonephritis is an infectious and inflammatory kidney disease with the localization of the inflammatory process in the interstitial and upper urinary tract.

Etiology: In 80% of cases in developed countries, the main causative agent of pyelonephritis is E. Coli. Uropathogenic microorganisms also include

bacteria of the family Enterobacteriaceae, Enterococcus spp., Staphylococcus saprophyticus, P. aeruginosa. At the same time, microorganisms such as S. epidermidis, Gardnerella vaginalis,

diphteroids, lactobacilli, anaerobes, practically do not cause urinary tract infections, although they also colonize the rectum, vagina and skin. The etiology of exacerbations of chronic pyelonephritis may differ depending on the severity of the process and the conditions for the occurrence of the disease — outside the hospital and in the hospital.

With an exacerbation of chronic pyelonephritis, which occurred outside the hospital, the etiological structure of the disease is dominated by E. coli. At the same time, when pyelonephritis occurs in a hospital (hospital infection), the spectrum of potential pathogens of the disease significantly increases, and the importance of Gram — positive microorganisms-enterococci, staphylococci (mainly S. saprophyticus) increases. In patients who are in the intensive care unit (ICU), especially in the presence of a urinary catheter, the etiological value of Pseudomonas aeruginosa and other non-fermenting gram-negative bacteria, as well as enterococci and fungi, increases. These features of the etiological structure of pyelonephritis should be taken into account when planning antibiotic therapy.

In approximately 20% of hospital-acquired pyelonephritis cases, more than one micro-organism is released from the urine, especially in patients with a permanent urinary catheter. During the course of the disease, there may be a change in the causative agent of infection, as a rule, polyresistant forms of microorganisms appear, especially with uncontrolled and unsystematic use of antibiotics. It should be noted that the patient's own urinary flora is very quickly (within 2-3 days) replaced by nosocomial bacterial strains, which are characterized by a higher level of antibiotic resistance. Therefore, pyelonephritis, which developed in the hospital, is characterized by a more serious prognosis and a persistent course.

Pathogenesis

More often, pyelonephritis develops as a result of the upward spread of infection, especially in the presence of reflux from the lower parts of the urinary system. The most common pathogens are Gram-negative bacteria (Escherichia coli, Proteus

and Enterobacter), which are normal inhabitants of the human intestine. When the disease occurs after catheterization of the urinary tract, it can be quite wide: Klebsiella, Proteus, Enterococcus feacalis, Pseudomonas aerugenosa, etc. At

adult women may have asymptomatic bacteriuria (5%) (usually Escherichia coli), and this percentage increases to 20% during pregnancy.

The ascent of the infection occurs in the presence of vesicoureteral reflux, which is of great importance in children, but also occurs in adults. The bacteria spread from the renal pelvis to the tubules as a result of intrarenal reflux. Reflux from the pelvis to the tubules is quite common, more than 60% of normal kidneys have reflux in at least one papilla.

The main factors contributing to the development of pyelonephritis are:

* short urethra in women;

* urinary stasis of any etiology (a high incidence of urinary infections during pregnancy is associated with an increased level of progesterone in the blood, which lowers the tone of the ureters, which leads to urinary stasis; at the end of pregnancy, pressure on the urinary tract with an enlarged uterus is important);

* structural disorders of the urinary tract that predispose to urinary stasis or lead to communication with infected sites, such as fistulas between the urinary tract and the intestines, skin and vagina;

* vesicoureteral reflux. In 50% of children and adolescents with pyelonephritis, this condition is found, which is hereditary, and is associated with a violation of the entry of the ureter into the bladder;

* bladder catheterization;

* diabetes mellitus.

Properties of E. strains that most often cause pyelonephritis

The presence of lipopolysaccharide Oantigens (O-1, O-2, O-3, O-6, O-16, O-18, O-75) that promote bacterial adhesion to the urothelium and initiate infection. The O-2, O-14, and O-22 strains cross-react with tubule wall cell antigens.

The presence of lipopolysaccharide, negatively charged K antigens (K-1, K-2, K-3, K-12, K-13) that prevent phagocytosis and bacteriolysis of E. coli, since the negative charge prevents the adhesion of opsonins

The presence of a common (structurally identical or very similar) lipid A, which can bind to the lipid membranes of tubule cells and support inflammation, causing tissue necrosis and inactivating complement. Lipid A induces the production of autoantibodies (against neoantigens of the renal tissue) and anti-lipid A antibodies that cross-react with the components of the tubular cells.

Morphology

Kidney changes vary depending on the stage of the process.

Chronic pyelonephritis is characterized by a gradual decrease in the volume of the kidney, which is inhomogeneously fine-grained. The capsule is usually thickened.

The pelvis is sharply expanded, the calyxes are deformed. The mucous membrane is thickened, without gloss, often with fibrinoid deposits.

Changes in the renal parenchyma are localized mainly in the brain layer. With dynamic observation, it is possible to establish the stages of the process — the formation of interstitial infarcts and atrophy of the tubules in intact glomeruli; the development of the initial elements of sclerosis with the involvement of glomeruli

and blood vessels in the process; the appearance of terminal sclerosis, leading to renal failure.

Classification

At the moment, there is no single point of view on the classification of pyelonephritis.

Classification of chronic pyelonephritis:

* primary (hematogenous) and secondary (urogenic)
* non-obstructive and obstructive pyelonephritis
* exacerbations or remissions
* latent or recurrent.
* the presence or absence of renal failure and its stage

Clinical picture:

Chronic pyelonephritis is a consequence of a poorly treated acute process, although clinically this transition is not always clearly expressed. Special difficulties in this regard are associated with a long period of latent course of the disease, when there are no symptoms, but the disease slowly progresses and worsens when exposed to provoking factors.

Risk factors for pyelonephritis:

* Infection
* Violation of urodynamics

* Concomitant pathology (pregnancy, diabetes, non-infectious kidney disease, immunosuppression)

The latent course of pyelonephritis is characterized by a minimal number of symptoms, sometimes after a cold, with random studies, there may be an incoming leukocyturia. This course is observed in 20 % of patients with pyelonenritis, but the disease progresses, after a while, under the influence of some factors, the infection becomes more active and begins to manifest clinically. The main complaints are: dysuria, fever from subfebrile to febrile. Simultaneously with the increase in temperature, chills are noted, which are not always adequate to the temperature, in some cases, chills are observed at normal temperature. Typical is the presence of pain in the lumbar region. The pathogenesis of pain in pyelonephritis is associated with overgrowth of the kidney capsule due to swelling of the renal parenchyma. It is impossible to exclude urine stasis, in a number of patients, pain can be localized in the abdomen. Hematuria may appear,

which is associated with the lesion of the fornical parts of the calyx by the inflammatory

process. 80-90% of patients have symptoms of chronic intoxication, such as

general weakness, rapid fatigue, decreased performance. Extremely typical

the development of dyspeptic symptoms, decreased appetite, the appearance of nausea, sometimes vomiting. It should be noted that these complaints appear before the development of uremia, so they cannot be explained by an increase in the level of nitrogenous bases. Part of the patients

they are concerned about headaches, which can be explained by both arterial hypertension and chronic intoxication.

It is necessary to note the dependence of clinical symptoms on the severity of the process.

Patients with more significant changes in the calyx-pelvic system have a greater number of complaints. On the contrary, with less pronounced changes in the calyx-pelvic system, the clinical symptoms are minimal.

In an objective examination of patients with pyelonephritis, first of all, the absence of edema attracts attention. It is probably more correct to say that patients have

with inflammatory changes in the pelvis, only moderate pasty of the face, occasionally of the lower extremities, is detected. More pronounced edema appears only with the addition of renal failure. The presence of edema with a calm course of the process should make you think about the correctness of the established diagnosis. The appearance of a gray tint of the skin is often noted. The skin is usually dry, with a characteristic dust-like peeling. The lip mucosa is dry. The tongue is dry, usually overlaid with a grayish coating.

On the part of the cardiovascular system, changes associated with an increase in blood pressure are found. Arterial hypertension is detected in 50-70% of patients. It is important to note that hypertension in pyelonephritis is quite labile and lends itself well to antihypertensive and anti-inflammatory therapy. As a result, normalization of blood pressure is observed at the dispensary in 90% of patients.

Laboratory and instrumental diagnostics:

* Urinary syndrome:

o various degrees of leukocyturia,

o proteinuria (usually less than 1 g/day,

o bacteriuria (>100,000 mt / ml for E. coli >10,000 mt/ml for pyogenic cocci),

o Decreased relative urine density,

* Rg-examination data (intravenous urography; computed tomography)

* Radioisotope studies (renography, scintigraphy)

* Biopsy (less important)

Repeated urine tests are crucial in making a diagnosis. At the same time, moderate proteinuria, leukocyte - and erythrocyturia are detected. The protein content in the urine usually does not exceed 1 -3 g/l. With latent pyelonephritis, 75% of patients lose less than 1 g of protein per day, and only 25% lose from 1 to 3 g. With a recurrent course of the process, proteinuria exceeds 1 g/day in 50% of patients.

It is extremely important to examine the urinary sediment. The most typical is the presence of leukocyturia. However, an increased number of white blood cells in the urine is not always detected, and in this regard, dynamic monitoring of patients is extremely important. Only with repeated studies, you can get an impression of the true frequency of leukocyturia in patients with pyelonephritis. Erythrocyturia with a recurrent course of the process is detected in most patients. Approximately 5-10% of patients have macrogematuria.

I would like to point out the low information content of the Nechiporenko sample, especially since it rarely meets the necessary conditions for collecting urine.

A bacteriological examination is mandatory. Urine culture should be repeated at least 3 times during the observation period. At the same time, only positive samples are taken into account when more than 100 thousand bacteria grow in 1 ml of urine.

X-ray examination in the diagnosis of chronic pyelonephritis plays an important, if not decisive role. Currently, excretory urography is more often resorted to, but in doubtful cases, the use of retrograde research is also shown. Already in the initial

stages of the process, a slowdown in the removal of the contrast agent on the side of the lesion is detected. Local spasms of the calyx-pelvic system are quite characteristic and early signs. More often, they capture the upper calyxes, corresponding to the location of the Disse sphincter.

More characteristic is the development of deformities of the calyxes and pelvises, which is manifested by filling defects associated with edema and infiltration of the walls.

With the long-term existence of the inflammatory process, the spasm is replaced by atony, including the ureters. Gradually, the initial sections of the calyxes become rounded, and the fornix is deformed. Changes in the renal parenchyma, characterized by edema and infiltration, are manifested by the presence of far-apart, usually already atonic cups. However, as the sclerotic process develops, the calyxes converge, the size of the kidneys decreases, their contours become uneven, and the root layer decreases.

Ultrasound and isotope studies. The sonograms of the kidneys of patients with chronic pyelonephritis with a latent course and a short duration of the disease differ little from the sonograms of normal kidneys. With a long-term disease and the progression of sclerosing processes, the heterogeneity of the calyx-pelvis complex (CHLC) is noted, the calyces are expanded, gape, which gives them the appearance of "moth-eaten". In the projection of the CHLC, small echopositive highlights are located, which do not give an acoustic shadow, which are foci of scarring. The thickness of the parenchyma remains within the normal range or decreases slightly, while the transverse size of the CHLC prevails over the thickness of the parenchyma. As the process progresses, the size of the kidneys decreases, the roughness of the contours increases, the heterogeneity of the CHL increases, the thickness of the parenchymal layer decreases, which is due to sclerosing processes in the kidneys.

Differential diagnosis:

Examples of diagnosis formulation:

1. Chronic pyelonephritis in the acute phase, recurrent course. Secondary hypertension. Stage 1B CPN.

2. Chronic pyelonephritis without exacerbation, latent course without impaired renal function.

3. Urolithiasis (stone separator) out of aggravation. Chronic pyelonephritis in the acute stage, recurrent course. Secondary hypertension of the CRF2A stage.

Treatment of a patient with chronic pyelonephritis:

Treatment of pyelonephritis should be comprehensive, including the following mandatory measures: elimination of the causes that cause a violation of the passage of urine or renal circulation (arterial or venous); antibacterial

therapy (empirical and etiotropic); treatment of coagulation disorders; symptomatic therapy; prevention of relapses and exacerbations.

Restoration of the outflow of urine is achieved, first of all, by the use of a particular method of surgical intervention. Often, after such operations, it is relatively easy to get a stable remission of the disease without long-term antibacterial therapy. Without restoring the passage of urine, the use of antibiotics usually does not give a sustained effect.

The main role in the treatment of pyelonephritis belongs to antibacterial

agents.

PRINCIPLES OF TREATMENT OF PYELONEPHRITIS

1. * Mild activity - on an outpatient basis with per os drugs (uncomplicated pyelonephritis-3-4 days, with complicating factors-7-14 days or more).

* The average degree of activity - in the hospital with the use of one parenteral drug, depending on the microbial flora. After 1-2 days after the normalization of body temperature, the transition to drugs per os is 7-14 days.

* Severe - parenteral administration of 2 drugs (cephalosporins of the II-IV generation + gentamicin). After 1-2 days after the normalization of body temperature, the transition to per os drugs within 7-14 days.

* Treatment of urosepsis is carried out in a hospital according to the general principles of sepsis therapy.

2. Therapeutic nutrition for oxaluria

Limit the consumption of foods rich in oxalic acid: sorrel, spinach, beets, beans, rhubarb, figs, parsley, plums, strawberries, gooseberries, cocoa, coffee, strong tea, etc.

Include: white and black bread, vegetable and animal oil, vegetarian soups, milk soups, fish and poultry in boiled form in limited quantities (150 g every other day), dishes of cereals and dough, cauliflower and white cabbage, lentils, cucumbers, turnips, asparagus, apples, quince, grapes, pears, dogwood. With an exacerbation of the disease, it is necessary to limit the use of dairy products containing a lot of calcium.

3. Therapeutic nutrition for phosphaturia

Phosphaturia is characterized by a violation of the acid-base state in the direction of alkalosis and the loss of poorly soluble calcium phosphate in the urinary tract. In this regard, the patient's diet is aimed at acidifying the urine , as well as limiting foods rich in calcium. Exclude: spicy snacks, spices, alcohol. Limit dairy and vegetable products, eggs.

Include: flour dishes, with a sufficient content of vitamins (A and D) and a plentiful introduction of liquid, weak tea without milk or coffee with a small amount of cream., bread, vegetable and butter, meat and fish in all types, peas, Brussels sprouts, asparagus, pumpkin, cranberries, red currants, sour apples.

4. Therapeutic nutrition for uraturia

The diet is characterized by a reduced quota of animal proteins, normal levels of fat and carbohydrates, with the exception of products containing large amounts of purines. The need for animal proteins is provided by milk and dairy products. The ratio between animal and plant proteins is close to 1 : 1.5.

Exclude meat and fish broths, extracts, soups, fatty meats (pork), fish (herring, sardines, anchovies), meat of young animals (veal, chickens), internal organs of birds and animals (liver, kidneys, brains). Meat and fish dishes are given no more than 2 times a week. Sorrel, spinach, cauliflower, legumes, raspberries, figs.

5. Herbal medicine

Advantages - the possibility of long-term use without special control studies, harmlessness, potentiation of the therapeutic effect of antibacterial drugs, sufficient activity against a number of pathogens.

When selecting herbs, take into account the need for a combination of herbs with antiseptic, diuretic and, if necessary, lithotripsy effect.

PHYTOTHERAPY OF PYELONEPHRITIS

The plant is anti inflammatory diuretic antispasmodic

Bearberry ++ ++ -

St. John's wort +++ + -

Field horsetail + + + + -

Elderberry ++ + + + -

herbaceous

Cornflower blue + - +++

Corn □ - + + +

stigmas

Nettle + - -

Chamomile ++ - -

Birch + + -

Carrot seeds + - +++

Heather obykn. ++ - +++

Antibacterial therapy.

Ideally, the antibacterial therapy of pyelonephritis should be etiotropic, i.e.

taking into account the isolated pathogen and its sensitivity to antibiotics. Due to the fact that the material for microbiological research in pyelonephritis is always available and with the correct organization of laboratory studies, it is possible to identify the leading pathogen, the empirical choice of antibiotics should be

considered adequate only at the initial stage of therapy. When receiving the results of a microbiological study, the therapy should be adjusted.

The choice of antibacterial drugs should be based on the spectrum of their antimicrobial activity and the level of sensitivity to them of the main pathogens of pyelonephritis. In this regard, the choice of antibacterial drugs for the treatment of pyelonephritis that occurred outside the hospital can be easily predictable, taking into account the data of regional pharmacoepidemiological studies. Currently, aminopenicillins (ampicillin, amoxicillin), cephalosporins of the first generation (cephalexin, cefradin, cefazolin), and nitroxoline cannot be recommended for the treatment of pyelonephritis, since the resistance of the main causative agent of pyelonephritis — escherichia coli — to these drugs exceeds 20%. It is much more difficult to predict effective antibacterial therapy of hospital pyelonephritis, since there are significant differences between medical institutions in the level of resistance of microorganisms. Planning of antibacterial therapy of pyelonephritis in the hospital should be based on the data of local monitoring of nosocomial pathogens and their sensitivity.

An important condition for the effectiveness of antibacterial therapy for pyelonephritis is the creation of bactericidal concentrations of antibiotics in the urine and kidney tissues. In addition, unlike other urinary tract infections, the antibiotic should create high serum concentrations, given the high percentage of bacteremia observed in pyelonephritis. In this regard, in pyelonephritis, such antibacterial drugs as tetracyclines, nitrofurans, and non-fluorinated quinolones, whose concentrations in the blood or kidney tissues are usually lower than the values of the BMD of the main pathogens of the disease, cannot be considered adequate.

Drugs recommended for treatment in a single dose for uncomplicated urinary tract infection

* TRIMETHOPRIM 600 mg
* CO-TRIMOXAZOLE 1.92 g
* NORFLOXACIN 800 mg

* CEFLOXACIN 800 mg

* CIPROFLOXACIN 500 mg

* FOSFOMYCIN TROMETAMOL 3 g

Drugs used to treat pyelonephritis

Semi-synthetic penicillins:

Aminopenicillins Ampicillin (per os, i / m, i / v 1.5-2.0 g / day); amoxicillin (per os 1.5-3.0 g/day);

Carboxypenicillins Carbenicillin (iv or iv 4.0-8.0 g / day with a 6-hour interval); Ticarcillin (50-200 mg / kg)

Ureidopenicillins Azlocillin (in / in 8-12, 0 g / day); Meslocillin (in / in 6-15, 0 g/day); Piperacillin (in/in 4-6,0 g/day).

Semi-synthetic penicillins in combination with beta=lactamase inhibitors:

Amoxicillin+clavulonic acid in/in 1.2 x 3 times a day

Ampicillin+sulbactam (oral up to 0.75 g / day, intravenous 1.5-6.0 g / day

Ticarcillin+clavulanic acid (in / in 12.4-18.6 g / day, divided into 4-6

injections)

Pipercillin+tazobactam (tazocim, iv 4.5 g 3 times a day)

Fluoroquinolones

Ciprofloxacin (0.5-1.0 g / day orally 0.2-0.4 g/day intravenously)

Pefloxacin (0.8-1.2 days orally, 0.8 days intravenously)

Ofloxacin (0.4-0.8 days orally, 0.2 days intravenously)

Aminoglycosides

Gentamicin 3-4 mg / kg v \ v, v\m

Amikacin 10 mg / kg in\in, in\m

Netilmycin (4-6 mg / kg i / v, i / m interval between injections of 8 hours of Carbapenem

Impenem+cilastatin (i/v, i/m 1.5-2.0 g / day to 4.0 g / day Meropenem (i / v 1.5-2.0 g / day to 6.0 g/day)

For both drugs, the interval between injections is 6-8 hours.

Etiotropic therapy regimens for nosocomial pyelonephritis

Microorganisms Drugs of choice Alternative remedies

Escherichia coli, Amoxicillin/Clavulanate Gentamicin

Proteus mirabilis Cefixime Levofloxacin

Cefotaxime Ofloxacin

Ceftriaxone Pefloxacin

Cefuroxime Ticarcillin/Clavulanate

Klebsiella spp., Cefixime Levofloxacin Ofloxacin

Sensitive to Cefotaxime Ceftriaxone Pefloxacin

Cephalosporin III Ticarcillin/Clavulanate Cefepime

generation

Klebsiella spp., Imipenem Piperacillin / tazobactam

resistant to Meropenem Ticarcillin/Clavulanate Cefepime

cephalosporins III

generations

Other Levofloxacin Amikacin

Enterobacteriaceae: P.

vulgaris

Enterobacter spp. Ofloxacin Imipenem

Citrobacter spp. Pefloxacin Meropenem

M. morganii Cefepime Piperacillin/tazobactam

Serratia spp. Ciprofloxacin Ticarcillin/Clavulanate

Pseudomonas aeruginosa Meropenem Amikacin

Cefepim Piperacillin/tazobktam

Ceftazidime Cefoperazone Ciprofloxacin

Acinetobacter spp. Imipenem Ceftaz

Evaluation of the effectiveness of treatment.

The administration of antibacterial drugs, as a rule, is accompanied by a rapid (within 2-3 days) improvement in the well-being of patients and a decrease in clinical symptoms. Complete cessation of symptoms of the disease is usually achieved by the 4th-5th day of treatment, and normalization of urine tests and hemograms - by the 5th-7th day, which, however, should not be the reason for reducing the full course of antibacterial therapy.

Clinical recovery is assessed by the disappearance of symptoms of exacerbation and normalization of urine analysis-the cessation of leukocyturia, pyuria, clinically significant bacteriuria (<104 CFU / ml). A mandatory component of the cure criterion is the eradication of the pathogen after treatment. Against the background of successful antibacterial therapy, the urine should be sterile by the 3rd-4th day of treatment. If the pathogen persists in the urine after the end of the course of therapy, it is advisable to continue using the antibiotic (taking into account sensitivity) for another 1-2 weeks.

Indications for hospitalization:

* Pronounced aggravation of the process.

* Development of intracorrectable arterial hypertension.

* Clarification of the functional state of the kidneys.

* Progression of renal failure.

* Urodynamic disorders that require restoration of the passage of urine.

* Intercurrent infections leading to exacerbation of pyelonephritis.

* Development of an expert solution.

Prevention

Prevention of pyelonephritis should be reduced to preventing infection of the urinary tract and reducing the possibility of exacerbation of the main process. In the presence of pyelonephritis, the prevention of its exacerbation is reduced to the elimination of the causes that contribute to the development of pathology (stones, strictures, etc.), and the prevention of colds. After cooling and colds, it is necessary

to do urine tests in order to diagnose the onset of an exacerbation in a timely manner.

Treatment of pyelonephritis consists in organizing the regime of life and work, observing proper nutrition and conducting courses of drug therapy.

Pyelonephritis is a disease that has been going on for decades, so the mode of life should change depending on the patient's condition and the activity of the process. During an exacerbation, bed rest, and possibly even a stationary regime, is indicated. Outside of the period of exacerbation and during the latent course of the process, the patient lives an ordinary life, without significantly limiting himself. At the same time, he can perform light physical exercises and even play sports (but without large loads). However, excessive cooling should be avoided, as any cold can lead to an outbreak of the process. There should also be no significant restrictions in the work.

Prognosis and outcomes

The initial prognosis in patients with chronic pyelonephritis depends on many factors. It is well known that if the disease develops in patients with kidney stones, it is difficult to treat, since there is a constant irritation of the mucous membrane with concretions, as a result of which the inflammatory process does not fade even with the use of powerful antibacterial agents. Pyelonephritis is extremely unfavorable in patients with diabetes mellitus, since disorders of carbohydrate metabolism contribute to the generalization of infection and reduce the reactivity of the body. A certain influence in pyelonephritis has on the course of the process and the prognosis, various congenital anomalies that contribute to the progression of the infection.

Factors that contribute to the stagnation of urine have a negative effect on the inflammatory process. Therefore, in patients with benign prostatic hyperplasia (adenoma), pyelonephritis, as a rule, does not respond well to therapy, which negatively affects the prognosis of the disease.

In the presence of primary pyelonephritis, the prognosis is determined by the stage of the process and the severity of kidney damage. So, it is well known that the addition of hypertension dramatically worsens the prognosis. Patients with high blood pressure are more likely to die from strokes and myocardial infarctions than from kidney failure.

The outcome of pyelonephritis may be chronic renal failure and vascular complications.

Vascular complications are relatively rare in pyelonephritis, approximately in 5-10% of patients. It is important to note that vascular catastrophes are usually preceded by high hypertension.