Ministry of Health of Ukraine
Poltava State Medical University
Department of internal medicine No 3 with phthisiology

Approved
at the meetihg of the Department of Internal
Medicine No. 3 with Phthisiology
Protocol № ____
"__" _____ 20____ p.
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Methodical instructions for the independent work of students during the preparation for a practical lesson and in class

Academic discipline	Phthisiology
Module №	1
Theme of the lesson 12	Complication of tuberculosis: hemoptysis, pulmonary bleeding, spontaneous pneumothorax. Pathogenesis, clinic, diagnostics, differential diagnostics, treatment. Emergencies in patients with tuberculosis. Curation of patients.
Course	4
Faculty	International
Specialty	Medicine

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Poltava - 2024

1. **Topicality of the theme:** Often TB of lungs especially him chronic forms have a complication. It is the pulmonary bleeding and spitting blood (21-23% cases) more frequent, quite often there are spontaneous pneumothorax (SP), amyloidosis, chronic pulmonary heart. As complications of tuberculosis threaten life of patient, and sometimes can be a lethal result, the doctor of any profession must be able to recognize complication and render the skilled first aid.

2. Specific objectives:

To analyze: frequency of origin of complications for patients on TB.

To explain: necessity of early exposure of TB to development of complications, complication of treatment of the complicated motion.

To offer: patients have ways of diminishing of origin of complications on TB.

To classify: complication (bleeding, SP, chronic pulmonary heart) is after weight which answers the proper degree.

To interpret: concept of spitting blood, pulmonary bleeding, spontaneous pneumpthorax, amyloidosis of internals, chronic pulmonary heart.

To draw: chart of development of chronic pulmonary heart; chart of inspection sick.

To analyze: given laboratory and x-ray methods inspections sick with the complicated motion of TB.

To make: charts of grant of the first aid are at the pulmonary bleeding, SP.

3. Base knowledge, abilities, skills, are necessary for study themes (interdisciplinary integration)

Names of previous disciplines	Skills are got
Anatomy	To know the structure of lungs, pleura
Patanatomy	To know the structure of TB of granulem
Physiology	To know the functions of lungs, pleura
Physiopathology	To know pathogenesis of TB. The rejections of breathing indexes are possible.
Propedevtics of internal illnesses	Able to collect complaints, anamnesis of disease and life, conduct the objective inspection of patient (review, palpation, percussion, auscultation)
X-ray inspection	To know the projection of parts, segments of lungs on x-ray inspection tape. X-ray signs of TB of lungs. To give description of shadows at different clinical forms.
Hygiene	To know governed the personal hygiene and hygienic mode, which patients, doctor and persons which are in a contact with a patient on TB, must adhere to.
Pharmacology	To know a pharmacokinetics, pharmacodynamics of ATP. To know a testimony, contra-indication.

4. Task for independent work during preparation to employment

4.1. List of basic terms, parameters, descriptions which a student must master at preparation to employment:

Term	Determination
Pulmonary bleeding	it is complication of TB which is characterized outpouring of

	blood in the road clearance of bronchial tubes and its excretion out with sputum.
Spitting blood	Expectorate out of blood streaks or separate blood clots in a sputum.
Spontaneous pneumothorax	it complication which is characterized penetration of air in a pleura cavity and development slump lungs is unconnected with violation of integrity of thorax.
Amyloidosis	Complication of TB which is characterized deep violation of protein metabolism with a deposit in parareticular tissues of amyloid.
Chronic pulmonary heart	it is complication, which is characterized a hypertrophy and (or) dilatation of right heart as a result of hypertension in the small circle of circulation of blood, predefined the disease of lungs, deformation of thorax or defeat of pulmonary vessels.

4.2. Theoretical questions are to employment:

1. Pulmonary hemorrhage, hemoptysis. The clinic, differential diagnostics.
2. First aid in case of pulmonary hemorrhage, hemoptysis.
3. Types of spontaneous pneumothorax. Clinic, diagnostics.
4. First aid at spontaneous pneumothorax.

4.3. Practical works (task) which execute on employment:

1. Name the most characteristic symptoms of the pulmonary bleeding:
- А. Pallor of skin covers.
- Б. Blood is red, foamy.
- В. Blood is dark with clots.
- Г. Bleeding is during a cough.
- Д. Bleeding is during vomit.

2. With what bleeding it is not needed to differentiate the pulmonary bleeding:
- А. Nose-bleed.
- Б. Gastric bleeding.
- В. The veins of gullet are varicose extended.
- Г. Bleeding is from the vessels of mediastinum.

3. Name the most characteristic symptoms of SP:
- А. Shortness of breath.
- Б. Palpitation.
- В. A cough is with a sputum.
- Г. Sharp pain is in a side.

4. The most informing method of diagnostics of SP is:
- А. Review.
- Б. Percussion.
- В. Auscultation.
- Г. Blood test.
- Д. Sciagraphy of thorax organs.

5. For a patient 60 years of, which suffers on fibrous-cavern TB of lungs suddenly there was the pulmonary bleeding.

What preparations to appoint above all things?
- А. Antitussal.

Б. Lowering pressure in the small circle of circulation of blood.
В. Send up of hemopexis.
Г. Coughing up.
Д. Compression a vascular wall.

6. The patient of 32, which suffers on dissemination TB of both lungs with complaints about sharp pain in the right half of thorax, is delivered in permanent establishment, at getting up on a 2th floor, the shortness of breath, weakness, appeared then. What complication does it follow to think about?
А. Spontaneous pneumothorax.
Б. Pleurisy.
В. Cardiac insufficiency.
Г. Pulmonary insufficiency.

7. Is there what main reason of origin of the erosive pulmonary bleeding at the chronic forms of TB?
А. Chronic hypertension is in the system of pulmonary artery.
Б. Permeability of vessels is enhancing able.
В. Violation in the convolution system of blood.
Г. Activating of fibrinolys.
Д. A tissue allergy is with hypersensitivity of endothelia.

8. What most reliable method of etiologic diagnostics of spontaneous pneumothorax?
А. Sciagraphy of organs of pectoral cavity.
Б. Tomogram of organs of pectoral cavity.
В. Pleurothoracoscopy.
Г. Pnevmotachometry.
Д. Bronchoscope.

9. What form of TB, as a rule, is accompanied forming of chronic pulmonary heart?
А. Primary forms of tuberculosis.
Б. Miliary tuberculosis.
В. Tuberculem with making progress motion.
Г. Fibrous-cavern tuberculosis.
Д. All are marked.

10. What pat anatomical substrate of pulmonary heart?
А. Hypertrophy and dilatation of right ventricle of heart.
Б. Violation of vascular architectonics of lights.
В. A liver is megascopic.
Г. Peripheral edema.
Д. Presence of bronchial ectasis and emphysema.

11. What condition does assist development of amyloidosis of internals at TB?
А. Protracted motion of disease.
Б. Complication a heterospecific festering infection.
В. Suction of toxic products of disintegration.
Г. Immunopathological of reaction, dysproteinemia.
Д. All are marked.

12.What form is TB most frequent complicated the amyloidosis of internals?

А. Tuberculosis of the unstated localization.

Б. Miliary tuberculosis.

В. Fibrous-cavern tuberculosis.

Г. Koniotuberculosis.

Д. Infiltration tuberculosis is in the phase of disintegration

Theme contents:

1. PULMONARY BLEEDING, SPITTING BLOOD

The pulmonary bleeding is complication of TB which is characterized outpouring of blood in the road clearance of bronchial tubes and its відкашлюванням.

Among reasons of the pulmonary bleeding TB makes ~16%, tumors of lungs – 40,9%, bronchial ectasy (enlargement) – 23,3%, other heterospecific pathological processes – 20,2%. In 8-10% cases reason and source of the pulmonary bleeding is not set.

Classification:

After intensity excretions of blood distinguish кровохаркання, bleeding and profuse (massive) bleeding (hemorrhage).

Depending on the amount of blood select:

- Spitting blood is bloodstreaks or separate blood clots in a sputum
- the small bleeding is of blood to 100 ml
- middle bleeding – to 500 ml
- large or profuse – over 500 ml, arises up as a result of break of large vessels and very often ends with death from an asphyxia.

Pathogenesis. Spitting blood and pulmonary bleeding can arise up in two ways:

- per diapedesin is violation of permeability of shallow vessels and capillaries of lights, predefined specific inflammatory changes in lights, by influence of toxic matters on the wall of vessels;
- per rexin is violation of integrity of vessel as a result of break. Arise up rarer.

It should be remembered that blood, before that how to be selected from lights outside, guilty to get a way through bronchial tubes, trachea, larynx and get to the oral cavity, it is possible only at presence of cough shoves. That is why there is not pulmonary bleeding and bleeding without a cough.

Nosotropic basis of the pulmonary bleeding is made hypertension in the vessels of small circle of circulation of blood, erosion, to the angioectasia and breaks of wall of pulmonary and bronchial vessels and increase of permeability of their walls as a result of inflammatory process, why activating of the system of fibrinoilis promotes as a result of гіпоксії. A bleeding source can be branches of pulmonary artery, branch of bronchial arteries which walk away from the arc of aorta and characterized high pressure of blood, as a result bleeding from bronchial arteries always are massive or profuse.

More frequent the pulmonary bleeding arises up at fibrous-cavern, infiltration, cirrhotic TB of lungs and sometimes at forming of lymph-nodule-bronchial fistula.

The clinical displays of the pulmonary bleeding and кровохаркання are characterized appearance of cough with the selection of foamy blood, clots or bloodstreaks in a sputum which can be accompanied stethalgias, feeling of heat (in 50%) on the side of bleeding, by wheezes. Blood from a pulmonary artery has a crimson color, from bronchial – light red, coagulates slowly. Pulmonary blood has an alkali reaction unlike blood from a gullet or stomach.

During palpation the skin of half of thorax on the side of bleeding is more warm, moving of bloody clots can be felt. Breathing at bleeding reflexly becomes hyposthenic, hearkened to the moist wheezes. At a bronchial obstruction, breathing absents.

The diagnosis of the pulmonary bleeding is proposed on the basis of clinical displays, but sometimes there are difficulties at establishment of bleeding reason, that establishment of diagnosis of basic disease which can be bleeding reason. The place of hemorrhage can be a mucus shell of oral cavity, nose, throat, gullet, stomach, here bleeding is not accompanied a cough. Therefore at first attentively examine an oral cavity, carried, throat, in order to avoid a diagnostic error, whereupon conduct the x-ray inspection of organs of thorax in two projections or computer tomography, and if necessary and bronchoscope. Sometimes, for establishment the places of the repeated bleeding conduct in the specialized medical establishments a bronchial autobiography which allows to find out violation of integrity of vessel on the output of contrasting matter outside a vessel (direct sign), angioectasi, presence of network of anastomoses between the branches of bronchial and pulmonary arteries (непрямі signs).

Differential diagnostics. To differentiate diagnostic spitting blood and pulmonary bleeding from bleeding from nose, pharynx, gullet, stomach.

Bleeding from a nose is characterized the selection of dark blood without a cough, which flows down on the back wall of gullet.

Bleeding from the extended veins of gullet begins suddenly, has profuse character, a cough absents. Thus for patients the cirrhosis of liver is diagnosed.

Blood from a stomach is selected at vomit, sad-colored, has the appearance of «coffee-grounds». In the case of bleeding from a gastric ulcer there is the large bleeding with the selection of the unchanged blood with vomit the masses.

Treatments of the pulmonary bleeding on the before hospital stage begin with that a patient is concluded in a bed in sejant position, that blood was better coughed up, calm him. Prepare hypertensive solution chloride of sodium in correlation a 1 tea-spoon on 1/3 glasses of water and give to have a drink. Sucked in, the chloride of sodium provides influent of tissue liquid of rich a thromboplastin in blood. Conduct discharge of small circle of circulation of blood with a redistribution and delay of blood in the large circle of circulation of blood by imposition on lower extremities of plaits. Thus control the maintenance of pulse in peoples. Each 40 minutes plaits dismiss on 5-10 minutes.

Patients with the pulmonary bleeding are subject immediate hospitalization, where will be well-to-do medicare, which includes for itself conservative treatment, endoscopic tamponad of vessels and surgical methods, is specialized.

Conservative treatment is begun with providing sick rest, severe ліжкового mode and sejant position that a patient must was possibility excretion blood the axsufflation of which in respiratory tracts carries the threat of asphyxia. Insignificant active and passive motions are possible during a medical inspection. If bleeding is moderate, complete physical rest is not obligatory.

1. Redistribution of blood arrive at introduction of solution *of atropine of sulfate* of 0,1%-1 ml 2 times per a day. Atropin extends the vessels of abdominal region, forms in them the depot of blood and with simultaneous introduction of solution *of sulfocamfocain* 10%-2 ml intramuscular, and provides discharge of small circle of circulation of blood.

2. Necessarily reduce pressure in blood vessels, for this purpose set *the «controlled low blood pressure»* that reduces an arteriotony so that he a maximal size did not exceed 90 mm of mercury stake and measure it hourly, supporting during 5-7 days, however below 80 mm of mercury stake. Setting of preparations for the decline of pressure in the vessels of lungs depends on the volume of крововтрати. At spitting blood and small bleeding it is expedient to utilize preparations of retarded-action, and at the large bleeding – rapid action to stopping of selection blood.

For this purpose enter ganglioplegics: solution *of arfonadum* 5%-5 ml intravenously or hypodermic on a 5% solution of glucose, solution *of hexonii* 2%-1 ml or solution *of benzohexonii* 2,5%-1 ml intramuscular or hypodermic, solution *of pentaminum* 5%-1 ml intramuscular or in vein on solution. The declines of pressure arrive at these in a bronchial artery.

For the decline of pressure in a pulmonary artery enter spasmolysants solution *of euphillinum* 2,4%-10 ml intravenously, solution *of Nospanum* 2% -2-4 ml hypodermic or solution *of papaverinum* of 2%-2 ml hypodermic.

3. On a background the controlled low blood pressure conduct *haemostaticy therapy* preparations of procoagulation action, with obligatory laboratory control of the state of the convolution system. The best haemostatic effect arrives at drops in vein introductions of 100-200 ml *of fresh-frozen plasma*. At a decline in peripheral blood of thrombocytes infusion of 100-150 ml *of trombocite mass* which activates the tromboplastic function of blood is rotined. At the terms of decline in blood of fibrinogen enter droply in vein solution *of fibrinogen* 1-10 grammas on days with addition 5-10 pressed units of heparin. At spitting blood a good haemostatic effect shows the use *an aerosol Thrombin* (250 mg on 5 ml of solution).

The vegetable pectin *of hemophobinum* is instrumental in aggregation of thrombocytes, what shows a haemostatic action. The use is possible, when possibility to control haemocoagulation is not. Enter haemophobinum in vein (a 1,5% solution is for 5-10 ml) or inward a 3% solution on a 1 soupspoon 3-4 times per a day.

Dicynonum (aethamsilat) is a 12,5% solution for 2 ml intravenously, hypodermic or inward for 0,25 grammas, activates a thromboplastin, stabilizes the wall of vessels, improves microcirculation.

Vikasol of 1%-1-2 ml in muscular stimulates making of factors of hemopexis a liver, but his action begins only in 12 hours, as a result he can be utilized as a preventive. Hypertensive solution of chloride of sodium (10%-10 ml), entered in vein, is instrumental in a wave in the vessels of tissue liquid, rich on a thromboplastin. Certain a styptic effect has an extract of nettle (for 20-30 drops to the meal), which can be used at small pulmonary bleeding.

4. At the terms of activating of the system of fibrinolysis (large bleeding, гіпоксія) setting *of inhibitors of fibrinolysis* is rotined: *aminocapron acid* of 5%-100 ml in vein 3-4 times per days, inward for 5 grammas 4 times per days; *contrical* or *trasilol* (inhibitors of proteolysis) 10-20 pressed ODES in vein on solution or 5 pressed ODES in inhalations. Effective synthetic antienzymic preparations such as *amben* 1%-5-10 ml in vein, in muscular or for 0,25 grammas inward 4 times per a day, but they are contra-indicated at a decline functions of buds.

5. Appoint preparations which *stabilize the wall of vessels*, diminishing its permeability: *prednisolon* is 0,4-0,6 grammas on days, GKS show the wide range of action – ant inflammation, stabilizing of membranes of vessels, stimulation of biosynthesis by the liver of IX factor of hemopexis and factors of protrombinic complex, stimulate

trombocitopoesis, antifibrinolytic action, diminish hypertension in the small circle of circulation of blood; *ascorbic acid* for 100 mg 4-5 time per a day; *ascorutin* for 0,5 grammas 3 times per a day. For diminishing of permeability of capillaries appoint *androxon* 0,025%-1 ml in muscular 2-3 times per a day. Diminishes permeability of wall of vessels, has an ant inflammation and ant allergic action also solution *of chloride of calcium* of 10%-10 ml in vein, slowly. *Antihistaminic preparations* are diazolinum 0,05 or Dimedrolum 0,05 grammas, tavegil 0,1 grammas or loratadin 0,01 grammas 3 times per a day instrumental in diminishing of permeability of vascular wall.

At the terms of the profuse bleeding, when a necessity of addition to the volume of circulatory blood is, quickly appoint introduction of droply or jetly solutions of a 0,9% chloride of sodium, lactat of sodium, Ringer's, colloids or preparations of blood.

For warning of aspiration pneumonia appoint the antibiotics of wide spectrum of action. At insufficient efficiency of conservative methods treatments are rotined bronchoscopes' stop of bleeding, lead through bronchi-alveolar lavage by solutions with haemostatic preparations. At the massive bleeding conduct temporal occlusion of bronchial tube a haemostatic foam rubber sponge with the help of bronchoscope.

A piezotherapy is instrumental stopping of bleeding or pneumoperitoneum.

If the transferred measures did not give an effect and there is a threat life, surgical interference – resection of the staggered particle or segment is rotined lungs.

2. SPONTANEOUS PNEUMOTHORACS

Spontaneous pneumothorax (SP) is complication which is characterized penetration of air in a pleura cavity and development slump lungs, unconnected with violation of integrity of thorax. A degree of collapse is lungs can be different from insignificant, when to the pleura cavity a few of air gets and forms the limited slump lights, to total, when all of pleura cavity is filled by air, squeezing a lung.

Pathogenesis. Select SP as complication of different diseases of lungs and idiopatic SP, when does not find pathological changes in lungs. TB of lungs as reason of development of SP makes near 12-17%. Reason of origin of SP are breaks of lungs at emphysema, bulls-dystrophic, cystic changes, perforation of cavities (cavities, abscesses) and breaks in the places of pleura accretions. Are dystrophic, cystophorous educations formed as a result of ChNLD, carried TB, at conios, to innate insufficiency of inhibitors proteinaz – α_1- antitrypsin. Reasons of break of lungs, pulmonary bulls, cysts can be strong physical tension, cough, distention of pleura accretions and others like that The perforation of cavity, abscess in a pleura cavity stipulates development of pyopneumothorax.

At the terms of obturated of shallow bronchial tubes the valvular mechanism of increase of pressure and development of bulls changes can be formed in the eventual areas of respiratory highway, bulls stretch as a result, that stipulates diffusion of air in a pleura cavity and forming of pneumothorax without violation of integrity of pleura.

Consequently, in pathogenesis of SP it is possible will select such components: violation of integrity of pleura penetration of atmospheric air is in a pleura cavity violation of impermeability and increase of pressure is in it removing a layer by the layer of pleura sheets a compression and collapse (slump) is lungs displacement of organs of mediastinum is in a healthy side.

Select closed and valvular pneumothorax opened.

At opened pneumothorax in pleural cavity pressure is evened 0. For closed pneumothorax a characteristic two-bit of air is with pressure in a pleura cavity scope -2

– +2. Valvular pneumothorax is characterized permanent growth of pressure in a pleura cavity with every inhalation, as a result there is a total compression atelectasis lung.

The clinical displays of SP depend on the degree of collapse lungs. At the terms of presence of pleura accretions or at diffusion of two-bit of air in a pleura cavity development of SP can be latent, when clinical displays absent and find out SP by chance at a x-ray inspection. Sometimes SP develops slowly, with appearance of feeling of weight in breasts, to discomfort, but without the expressed functional violations. Patients adapt oneself to such state and for medical help does not apply.

At the terms of collapse 40-50% lungs and greater SP develop sharply. Often after strong tension suddenly there is pain at a side and sharp respiratory insufficiency develops, sometimes accompanied a fainting fit. A patient occupies the forced sejant position. There is diffuse cyanosis, perspire. Breathing is frequent, superficial with participation of auxiliary muscles. On the side of SP inter costal areas can be extended. The vocal shaking is not conducted. At percussion find out a boxing sound. Not hearkened to respiratory noises. Tachycardia is with violation of rhythm, displacement of limits of cardiac dullness in a healthy side, pulse 90 and anymore Ps/min. A temperature of body is within the limits of norm. At the not grant of medicare death can come from pain shock or collapse.

Diagnose SP mainly by the x-ray inspection of patient, when find complete, incomplete or partial absence легеневого a picture on the side of SP, which determines a degree an atelectasis lungs, displacements of mediastinum, presence of pathological changes in lungs, accretions of pleura sheets, liquid in a pleura cavity. A sciagram is conducted in the phase of inhalation and exhalation, when more expressly evidently edge atelectasis lungs.

Plevrotoracoscopy is the method of etiologic diagnostics of SP enables to conduct a review in 85% cases and will set the morphological changes of pleura sheets, their accretion, presence of pathological changes in lungs, breaks, and their size which determines character and volume of medical measures largely.

Treatment. Patients are on TB, complicated SP subject immediate hospitalization in a surgical (thoracic) separation. Set the severe bedly mode. The anesthetic appoint facilities (analgin – 3 ml in muscular), ant cough preparations (codterpin for 1 tab. 3-4 times per a day), cardiac preparations (corglicon 1 ml or strophanthin of 1 ml in vein), sedates preparations (seducsen 2 ml or sibason 2 ml in muscular), for conduct oxygen therapy a testimony.

Evacuation of air at SP for conduct a testimony by Tran thoracic puncture or draining of pleura cavity. For this purpose under a top narcosis in 3-4 inter costal for at front axillaries lines do a troacar a puncture and enter a drainpipe through which evacuation of air is and violence is forced lungs. During 1-5 days of draining in 90% cases a lung falls out, that confirms an x-ray inspection and draining halt. At terms, when lights do not arrive at violence, apply a diathermocoagulation in during thoracoscopy. But if defeats are considerable, it is rotined surgical in seaming of defect or economy resection of bulla changes in lungs.

If a bulla-dystrophic process in lungs is widespread and saved threat of relapse of SP, after draining apply chemical pleurodes by introduction to the pleura cavity of matters (talc, suspensions' of tetracycline, 5% solution of alcohol, tincture of iodine, morphocyclinum and others like that) which cause aseptic inflammation and obliteration of pleura cavity. With the purpose of warning of development of pleurisy, as complication of SP, conduct ant bacterial therapy.

Complication of SP:

- Sharp respiratory and sharp hearth insufficiency;
- A hemorrhage is in a pleura cavity;
- Exudates pleurisy;
- Empyema of pleura;
- Hypodermic and mediastinum emphysema.

3. AMYLOIDOSIS

An amyloidosis is complication of TB which is characterized deep violation of protein metabolism with a deposit in parareticular tissues to the amyloide.

Amylum is a lat.- starch is animal – amyloidosis. Likeness of pathological changes with starch was foundation for R. Virkhov to give will name illness an amyloidosis. An amyloidosis develops on a background hipoxy, avitaminosis (especially to the deficit of vitamin of C), parafunction adrenal glands.

Pathogenesis of amyloidos: there are a few theories of development of amyloidos.

1. A theory of disproteinos is violation of protein metabolism with piling up in blood of coarse-particle albumens and amyloid albumens, that jointly outside vessels form an amyloid. Touches one link of amyloidos only, not touching starting elements.

2. An immunological theory is violation of cellular and humoral immunity. Undoubted and fully applicable to the second amyloidos which an amyloidos is at TB – protracted antigen stimulation conduces to appearance of amiloid blast cells, secreting fibril squirrel, that unites from large dispersive a plasma albumen, forming an amyloid.

3. Mutational theory – This allows explaining all of forms of amyloidos (second, genetic, senile, tumor amyloidosis).

4. Modern theory of amiloidos of Serov and Shamov (1977): the starting mechanism of development of amyloidos is disintegration of tissues. Products of disintegration of albumens - antigens - hypercensibilisation - transformation of cages of RES - formation of amiloidblast, that product an anomalous fibril albumen, that, uniting with plasmatic squirrel and glycoproteins (by polysaccharidess), result in formation of difficult complex an amyloid which 96-98% consists of protein.

Patanatomy. An amyloid is a difficult albumen, in the structure of which distinguish fibril squirrel, polysaccharidess of plasma (plasma component). An amyloid unites with the reticular and collagen fibers of plasma. Biosynthesis of fibril albumen – basic matter to the amyloid, plasmatic carry out and lymphocytes similary cells, and in organs are celles of mesenchim nature (reticular, Kuppher's and others like that, that celles of RES, which takes part in forming of immunological defense).

An amyloid is localized in the wall of vessels, in stroma of organs, in the own shell of glandular structures. The function of органа is saved thus. Violation of plastic processes, atrophy of organs, their sclerosis, develops in future. Tissues of organs compression, become fragile, beeswaxsimilar, then amyloid wrinkling of organ, hipoxy, activating of fibroblast, sclerosis, parafunction.

Parenchymal amyloidos: spleen, liver, buds, pancreas, bowels.

Mezenchimal amyloidos: myocardium, muscles, lungs, skin.

An amyloidos is divided: general (generalization), local, tumor similar (amyloid tumor).

An amyloidosis in sick TB develops in 3-8 years, but can develop in 2 years and less than. More frequent develops for men to 40, sometimes in senior age.

Distinguish 5 forms of amoloidos:

1. Idiopathic – reasons and mechanisms of development are unknown.
2. Inherited – domestic (genetic).
3. Purchased (second) – develops as complication of illnesses.
   Reasons of development: TB, chronic infections, illnesses which are characterized festering-destructive processes (ChNLD, osteomielitis, suppuration of wounds, phlegmon), malignant new formations and others like that. At the second amyloidos mainly parenchyma organs are struck (parenchimal amyloidosis).
4. Senile are involution violations of exchange of albumen.
5. Local tumor, not clear nature.

Classification of Serov and Shamov:

- latent (hidden, before clinic) phase;
- protein uric phase;
- nephritic (edema-hypoproteinemic) phase;
- nitrogen phase.

Clinic: 1st latent phase – a basic disease prevails. In urine – inconstant proteinuria, in sediment – microhematuria are the single lixiviated red corpuscles, leucocituria, cilinderuria are single hyaline cylinders. Hepatomegalia. In blood – high RSE is to 60 mm/hour. Duration of this stage to 2 and passing to the 2 stage: the symptoms of basic disease are expressed; bar of albuminuria, an albumen in urine is 3-6 grammas/l, in sediment of leucocytes more than 10, microhematuria, cylindruria. In blood of disproteinemia is a decline of albumin and increase of globulins, leucositosis, speed-up RSE. Poliuriya, decline of specific closeness of urine.

3 phase – nephritic: the function of buds is violated, adrenal glands, livers; sharp weakness, loss of appetite, nausea, violation of chair, subfebril temperature Objectively: tones of heart are muffled, a liver is megascopic (+4-6 cm), spleen in 50% patients megascopic. Edema appears from small to the anasarca. Low blood pressure (110/60 mm.m.s.) develops, high blood pressure develops in 19% (AT of 160-180/100 mm.m.s.). Proteinuria arrives at 10-33 grammas/l, all of types of cylinders. Specific closeness of urine 1010-1017. For Zimnicky – izohypostenuria, nighturia, oligouria.

In blood: norm chromic anemia, anisocytosis, poikilocytosis, leucositosis. Remaining nitrogen of blood rises to a 0,6 grammas/l, hypoproteinemia, disproteinemia grow. Duration of this stage is small – patients die.

Quite often the 3 stage passes in 4 – nitrogenic – nephrosclerotic, buds shrivel partly, excretion urin is violated, there is condensation of blood, piling up in it of nitrous slags, hypouria develops, and then and anurine. Proof head pain, nausea, vomit, apathy, somnolence, paropsis, develop on a background a sharp weakness. Duration of this stage can be different. A disease passes to uremia who and death comes. A night urine is saved, izohypostenurine, edema can will diminish. Nitrogen of blood rises to a 1 grammas/l. In blood: hypochromic anemia, leucositosis, RSE goes down. A liver, spleen, is often megascopic.

Sometimes the 2nd stage can pass in 4.

Other forms of amyloidosis can develop:

- hepatomegalic is dyspepsia, hydro peritoneum, flatulence, icterus;
- splenmegalic;
- Adison's form – the symptoms of the impression of adrenal glands prevail;
- intestinal form – accompanies a general amyloidosis, profuse diarrhoea to 10 times per days, peritonitis, with appearance of ATP almost not observed;

- pancreatic form – is combined from intestinal;
- a cardiac form is a clinic of myocardit.

Diagnostics:

1. Presence of chronic disease.
2. Clinical symptoms.
3. Urinary syndrome.
4. Changes in blood are a dysproteinemia, increase of fibrinogen, cholesterol, remaining nitrogen of blood.
5. Para function buds.
6. Puncture a biopsy is the most reliable method.

Treatment of amyloidosis depends on the stage of amyloidosis.

1-я and the 2-я stages: radical treatment of TB PTP, to which the sensitiveness of MBT was saved and which do not have a side influence on the function of buds and liver with nosotropic facilities, up to surgical interference.

Preparations of aminohinolon row, brake formation of mucopolisacharid:

- delagil – 0,25 g 2 times per a day, after-meal, during 1-2, interruption in 8-10 months on 1-2 months
- plaqunil
- rezoning
- hlorohin

Appoint vitamins, ant histamine preparations – after testimonies.

Prednizolon – 20 mg after a chart, long-term.

Preparations to potassium, anabolic steroid.

Diet: limitation of liquid, carbonhydrates, salt and fat dishes.

Preparations of liver: vitohepat. To plug in a feed 100 g of wet liver during 2 months, then 2 months – sirepar or campolon for 3 ml in/m 2 times per a week, then 1 month interruption and again wet liver.

Active tiol connections: a methionine is 0,5 – 1,5 grammas into 3-4 times per a day, 30 days, unitiol

Protein therapy: альбумін, proteins 1 time per 5-6 days

Diet: to eliminate products with a casein and increase products with starch is a potato, corn, rice. Albumen due to a liver, mutton, a flour is rye, water-melons, melons, cheap restaurants, cucumbers, butter is creamy, vegetable.

3-я stage: a chemotherapy it admits only at sharpening of TB of process.

Prednizolon is in the initial stage

Albumen.

4-я stage: chemotherapy not recommended.

Transfusion of plasma; at acids is a soda, at vomit is a NaCl.

Lespenefril – preferentially excites the parenchyma of buds.

Symptomatic facilities.

Prognosis: patients died before (to 1952 years). Presently a prognosis depends on the stage of TB of process. The cases of clinical convalescence are known as a result of amiloidoclasy.

4. PULMONARY HEART

A pulmonary heart (PH) is complication, which is characterized a hypertrophy and (or) dilatation of right heart as a result of hypertension in the small circle of

circulation (SCC) of blood, predefined the disease of lungs, deformation of thorax or defeat of pulmonary vessels.

Meets very often in sick TB of lungs (fibrous-cavern, cirrhotic, chronic dissemination), chronic empyema of pleura, at an obstructive bronchitis, bronchial asthma, at Besnier-Boeck-Schaumann (III item), and infiltration TB.

Classification of pulmonary heart:

I. Around by motion:

- Sharp pulmonary heart (TELA) – develops in a flow from a few hours to 1-3 days.
- Sub sharp PH – a few days is a week.
- Chronic PH – formed long time.

II. After functional violations:

→ PH is compensated;

→ decompensate of PH – circulation of blood is violated in the large circle of circulation (LCC) of blood, that insufficiency of circulation of blood is (IC):

- PH from IC-1 (1 to the degree) – the signs of stagnation in LCC are expressed moderato, characteristic insignificant increase of liver, pain in right intracostal at the physical loading, edema on lower extremities, which disappear at treatment.
- PH from IC-II is a hepatomegalia and painting livers, the edema of lower extremities, violation of retractive function of myocardium are sharply expressed.
- PH from IC-III is the terminal stage which is characterized the second defeat of other organs and systems.

III. For pathogenesis:

- Vessel's mechanism;
- bronchi-lung's;
- thotax-diaphragmal

Etiology of PH. Reason of PH are different diseases of lungs, pulmonary vessels and thorax. In this connection distinguish three his varieties:

а) bronchi-lung's form – develops as a result of diseases which strike bronchial tubes and teeth ridges initially are a chronic obstructive bronchitis, emphysema of lungs, bronchial asthma, tuberculosis, Besnier-Boeck-Shaumann, polycystic;

б) vessel's form – arises up as a result of primary pathology of vessels of small circle of circulation of blood is embolism, collagenoses;

- в) thotax-diaphragmal's form – caused primary pathology of thorax with limitation of its mobile is scoliosis, kifos, obesity, illness of Bekhterev.

Pathogenesis. PH as complication of TB develops during many years. A procatarxis is a parafunction external breathing and structural changes in lungs which predetermine second pulmonary hypertension, increase of loading on a right ventricle and his hypertrophy.

In the areas of lungs which are not enough ventilated there is a spasm of vessels (hypoxic vasoconstriction), that on the initial stages is an adaptation change and provides more intensive delivery blood functionally of suitable departments of lungs. On the measure of progress of pathological process, all more vessels spasm, that results in growth of endovessels resistance. The value of increase of endovesicles pressure which causes high hydrostatical pressure in capillaries has also. Violation of unrespirator functions of lungs predetermines pathological influence of biological active matters (bradykinin, serotonin and others like that). Violation of vascular architectonics

of lungs as a result of TB, and also arterial hypoxemia which is accompanied policytemia results directly in the increase of work of right ventricle. Weakening of retractiveness of heart, caused dystrophic changes which develop in him as a result of hypoxia and general intoxication, complement the chart of pathogenesis of PH. If on the early stages of disease pulmonary hypertension is predefined mainly the spasm of vessels of SCC, a vascular sclerosis prevails later. From sometimes a right ventricle stops to be corrected decompensate develops with the enhance able loading. The stagnant phenomena appear in LCC. The changes of haemodynamics are indicated by basis of forming pathoanatomical substrate of PH are hypertrophies, and later and dilatations of right ventricle of heart.

A degree and duration of increase of pulmonary arterial tone (normal pressure in a pulmonary artery does not exceed 21-25 mm. m. s.) underlay selection of three stages of PH: 1 stage – transitory – the pathological increase of arterial tone arises up at growth of requirements to the respiratory and cardio-vessels systems (physical loading, hypoxia, sharpening of pulmonary pathology).

2 stages are an increase of pressure in the system of pulmonary artery in rest and in the phase of remission of inflammatory process.

3 stages – stable pulmonary hypertensy is accompanied the phenomena of insufficiency of circulation of blood.

Clinical picture. Pathological signs which are determined at the physical inspection of patient from PH testify, as a rule, about a process which already called far and to set a moment, when the cardiac joins in with pulmonary insufficiency, hardness enough.

On the early stages a epigastral or pericardiac pulsation is only increased by the sign of hypertrophy of right ventricle. Accent or split II sink above a pulmonary artery is the sign of increase of pressure in it to 50 mm m. s. and higher. It appears in 68% patients in the stage of indemnification. During distribution of heart and vessels on the basis of cirrhotic changes in lungs such signs lose informing, that is why more reliable method of diagnostics of KHLS is measuring a yew in a pulmonary artery.

The unfolded picture appears only with beginning of decompensate of right departments of heart, which shows up the shortness of breath, which patients well carry in position, lying, unlike the impression of the left departments of heart, when more easily a patient to sit. Characteristic diffuse cyanosis (dark blue) the first signs of which appear in language, he becomes bright raspberry or dark blue is the sign of chronic hypoxemia with disbacterios. Eyelids are pale grey, синюшні. Nail plates are pale bluish – this symptom develops, when a patient will stand, the marbleness appears on brushes. Skin of heat. Ortopnoe not characteristic.

Weight in right under ribs and megascopic liver is the symptoms of weakness of right ventricle, can be perceived as a side effect from chemidrags, but it is stagnation in a liver. A bradyhemarrhea registers not only in a liver but also in a spleen.

Pain in the area of heart, predefined reflex spasm coronary vessels as a result of distension wall of pulmonary artery, is possible. Quite often there are head pain and somnolence which is the result of hypoxemi and hypercapnia.

Epigastrial pulsation of different expressed and volume, all of epigastrial pulsates sometimes. On the late stages it is possible to hear out diastolic noise on a pulmonary artery (as a result of relative insufficiency of semylunar valves and distension of pulmonary artery). A venous pulsation on a neck is a sign of deep

decompensation, on inhalation of vein disappear, on exhalation appear is a bad prognosis.

Deep decompensation appears obvious or hidden edema. For the exposure of the hidden edema collect day's urine, then give lasix and again collect day's urine, comparing volumes. Appearance of hydroperitoneum – a bad sign prognostic.

On the measure of progress of decompensation cardiac insufficiency is increased, the left heart is pulled in, the shortness of breath grows, a patient accepts position of ortopnoe.

Diagnostics of PH. Haemogram does not change at PH. Can be displaced pH blood in a sour side.

For early diagnostics of PH the instrumental methods of research are needed. In their basis the exposure of pulmonary гіпертензії lies on the initial stages of process, when it is predefined functional mechanisms and that is why is reverse. Most reliable is invasion determination of pressure in a pulmonary artery, that for such patients dangerous enough and utillized rarely.

The safe and informing method of determination of pressure in a pulmonary artery is echocardiography with determination a gradient to the yew on the valve of pulmonary artery. This method allows most exactly to estimate the thickness of walls and sizes of cavities of right departments of heart.

Echocardiografy. From data echocardiography it follows the most informing criteria to count the increase of thickness of wall of PSH (more than 3,5 mm), jumboizing his cavity (N = 1,5-2,3 cm), diminishing of faction of banishment and shock index.

EKG of change discover only at expressed hypertensi (systolic pressure of more than 50 mm. m. s.). the signs of hypertrophy of right ventricle is: a high indent of R is in V1>5 (7) mm and deep indent of S in V5, expansion of indent of P_{II-III}, relation of R/S in V1>1, RIV + SV5>10,5 mm (index Falcon), QR in V1 of condition of absence of focal defeats of myocardium, sign of overload of right ventricle of V1-V2.

X-ray diagnostic PH:

Right contour:

a 1th arc on a right contour is an ascending aorta

a 2th arc on a right contour is a right auricle

Left contour

a 1 arc is a descending aorta

a 2 arc is a pulmonary artery

a 3 arc is an ear of the left ventricle

a 4 arc is the left ventricle

X-ray sings of PH:

→ On the right edge of shade of heart of correlation of arcs in a norm is 1:1. At LS a direct signs is a change of correlation in connection with an increase 2nd arcs.

→ A direct sign of LS is tuberal of 2 arc for the left edge, acute angle between 1-st and by 2nd arcs (in a norm he is dull).

A heart can acquire kind hill-shaped.

X-ray determine tuberal of barrel of pulmonary artery, strengthening of vascular picture of root at relative impoverishment him on periphery of lungs, strengthening of pulsation in the central fields of lungs and weakening of it in peripheral departments, increase of right ventricle and right auricle. The important sign of stable pulmonary

гіпертензії is an increase of diameter of right downleg of pulmonary artery more than 15 mm.

Treatment of PH is conducted depending on his stage.

Treatment only of TB requires in the stage of indemnity, as far as mechanisms suffice for providing of normal work of heart. Beside the purpose to appoint preparations which remove the spasm of pulmonary vessels, because liquidation of crampy, caused by hypoxya, results in the increase of circulation of blood in areas which are badly ventilated and hypoxemia rises. A respiratory gymnastics and rehabilitation measures has a large value. Smoking, stay is categorically forbidden in dust-laden apartments.

In the stage of decompensation complex therapy, which influences on respiratory insufficiency, hypoxemia, hypercapnia, acidosis and actually cardiac insufficiency, is needed.

Treatment of respirator insufficiency consists in a lung from TB by a process and PH. Rational ABT is combined with steroid hormones, which considerably diminish an inflammatory process, bronchial spasme, delay of liquid in an organism.

It is expedient to utilize bronchilitics: euphyllin 2,4%-5,0 ml with solution of glucose of в/в or 24%-1,0 ml in/m 2-3 times per days, which extends bronchial tubes, diminishes the spasm of vessels of SCC and reduces pulmonary hypertensis. Appoint bronchilitics in inhalation forms in connection with the best hit of preparations to the bronchial tubes: atrovent, salbutamol, spirive, berotec.

For the removal of bronchial obstructive and facilitation of secreting sputum execute postural (positional) drainage, respiratory gymnastics, oscillation massage of thorax.

In a holiatry an important role is played by oxygen therapy which diminishes arterial hypoxemia.

Treatment of cardiac insufficiency consists of two components: strengthening of retractive function of heart and diminishing of the haemodynamic loading is on a heart. The first is provided by facilities with positive cardiatrope influence (cardiac glicisids), second are diuretic and peripheral vasodilatator.

From cardiac glucosides during the expressed decompensation utillize в/в *corglicon* 0,06%-1,0 ml or *strophanthin* of 0,05%-0.5 - 1,0 ml to appearance of signs of satiation and improvement of the general state of patient (diminishing of sizes of liver, edema, frequency of heart-throbs). In subsequent pass to supporting the doses of digoxin or celanid in pills which pick up individually.

Diuretci diminish maintenance of in vein solution. Treatment consists of two periods: in the first, active period the amount of excretion urine must prevail the amount of the used liquid on 800-1500 ml; in the second – after disappearance of edema, adhere to the equilibrium between the volumes of the used and selected liquid. At the initial stages of HI the antagonists of aldosteron are rotined veroshpiron 100-400 mg, triamteren 50-150 mg on days, that have a potashium extantly effect. The inhibitors of carboangidras additionally diminish carbonic acid in blood: *diacarb* by 0,5-0,75 mg courses for 3 days. On the late stages HI appoint *furocemidò* 1,0 in/m or in/v. For patients on TB it is expedient to appoint osmotic diuretic which provide degidratation of tissues due to the increase of osmotic blood: *a manitol* is a 5-10-20% solution of in/v from a calculation 0,5-1,5 on the kg of mass of body.

Peripheral vasodilatators reduce tone of vessels, the venous returning of blood is thus limited to the heart, promote retractive ability of myocardium, diminish viscidity of

blood and ability of agregetion of thrombocytes: *nitroglycerine* for 1 tab 4 times per days, nitrates (*Nitrongum* for 1 tab 2 times per days, *Trinitrolongum*, *sustac*) are prolonged, *molsidomin* 2-4 mg 3 times per days.

Facilities which improve metabolic and power processes in a heart – *riboxin* or *orotat to potassium*, *panangin* for 1 tab 3 times per a day during 1,5-2 months, *anabolic hormones* (retabolil, ntrobol), *vitamins* (decamevit).

Oxigen terapy improves oxigenated of tissues, instrumental in diminishing of shortness of breath. Due to diminishing of lungs resistance pressure goes down in a pulmonary artery (due to expansion of road clearance of arteriol), retractive ability of myocardium is improved. Protracted oxygen therapy is used, not less than 15 hours. Periodic sessions of breathing oxygen for 15-16 minutes on a day uneffective.

A prognosis at PH is serious and determined motion of TB and progress of cardiac insufficiency.

Materials are for self-control:

A. Task for self-control (tables, charts, pictures, graphic arts):

B. Task for self-control

1. Sick к., 40 years. 10 years TB of right suffers on fibrous-cavern lungs, with periodic excreting MBT. To the doctor appeared with complaints about the shortness of breath, weakness, perspire, subfebrill temperature. From hospitalization renounced. In the evening at home the pulmonary bleeding began for a patient, the loss of blood made 300 ml.

What must be tactic of doctor in this case?

2. Patient of D., 50 years. TB of both lungs is ill 5 years with development of cirrhosis of overhead part of right lungs. For the last month the state sick worsened: the shortness of breath was increased, a sputum became festering, spitting blood appeared. Diagnose. **What genesis of spitting blood? What tactic of doctor? Appoint treatment.**

3. Sick M., 54 years. Suffers on a dissemination TB of both lung with disintegration, MBT +. Coughed a morning, whereupon sharp pain appeared in the left half of thorax, shortness of breath. A patient is delivered in a clinic. Skin covers are pale, pulse is 110. On the left timpanic, breathing is not listened. At siagram the left lung of compression on to 1/3 volumes, the organs of mediastinum are displaced to the right. **What diagnose and urgent help does need to be rendered a patient?**

4. The patient of 25 years had bleeding. Blood is selected from a mouth, red color, foamy. A selection blood is accompanied a cough, no admixtures are not to blood. On the left, above a lower particle there are lungs, heard finely and middle moist wheezes. **What type of bleeding is observed for a patient?**

5. The patient of 66 years suddenly felt sharp pain in the right half of thorax. The shortness of breath grows, there are cyanosis, death-damp. Percussion above a right lung - tympanic, not hearkened to breathing, a heart and organs of mediastinum is sharply displaced to the left. Seagram: right lung of collapse to root on 1/2 the volume. Pressure in a pleura cavity is evened to atmospheric.

What type of spontaneous pneumpthorax is observed for a patient?

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