Ministry of Health of the Republic of Belarus
Educational Institution
“Gomel State Medical University”

Department of Pathological Anatomy

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METHODICAL GUIDELINES

for conducting a practical class
in the academic discipline “Pathological Anatomy”
for students
of the 3rd year, Faculty of International Students (instruction in English),
enrolled in the specialty
7-07-0911-01 “General Medicine”

Topic: “Rheumatic diseases”

Duration: 3 hours

Approved at the meeting of the Department of Pathological Anatomy
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2025

EDUCATIONAL AND INSTRUCTIONAL GOALS, OBJECTIVES, AND MOTIVATION FOR MASTERING THE TOPIC

Educational Goal:

- To study the pathomorphology and pathogenesis of rheumatism. To indicate that rheumatism is the most common nosological form of collagen diseases and is characterized by systemic progressive disorganization of connective tissue and the microcirculatory bed. To draw attention to the infectious-allergic origin of rheumatism, emphasizing the particular role of β-hemolytic streptococcus. To note the importance of recurrent tonsillitis, past infections (scarlet fever), and cold exposure in the development of the disease. To analyze the nature of connective tissue disorganization in rheumatism (mucoid swelling, fibrinoid swelling, sclerosis, hyalinosis, cellular reactions) with predominant involvement of the heart. To study the histogenesis of the rheumatic granuloma (Aschoff body). To examine the types of rheumatic valvular endocarditis (diffuse, acute verrucous, recurrent verrucous, fibroplastic), its outcomes, and possible complications. To analyze the features of rheumatic myocarditis and pericarditis. To characterize the clinical-anatomical forms of rheumatism (cardiovascular, polyarthritic, cerebral, nodose), indicating the particular significance of the cardiovascular form as the most common clinical-anatomical variant of the disease.
- To analyze the types of valvular defects of rheumatic origin (stenosis, insufficiency, combined) and the concept of compensated and decompensated valvular disease, as well as the morphological features characterizing them.
- To emphasize the particular role of rheumatism in the origin of acquired heart valve defects, mentioning rare cases of non-rheumatic etiology (atherosclerosis, syphilis, septic endocarditis). To analyze the causes of death in patients suffering from rheumatism and valvular heart disease.
- To analyze the etiopathogenesis of diseases belonging to the group of rheumatic diseases (rheumatoid arthritis, systemic lupus erythematosus, systemic scleroderma, polyarteritis nodosa, dermatomyositis, ankylosing spondylitis, Sjögren's syndrome). To examine the features of their common characteristics and morphological differences. To analyze the causes of death in these patients.

Instructional Goal:

- Within the framework of the educational process for this academic discipline, the student must acquire not only theoretical knowledge, practical skills and abilities in the specialty but also develop their personal potential. They should cultivate qualities of responsibility and patriotism, be prepared to actively participate in the economic, socio-cultural, and public life of the country, recognize the social significance of their future professional activity, understand the norms of medical ethics and deontology, and learn to observe academic and labor discipline. In the course of studying the educational material, students should realize the importance of maintaining a healthy

lifestyle and, as an example in the future, when performing professional duties, set an example for those around them and their patients.

Objectives: Upon completion of the practical session, the student must:

***Know*:**

- The definition of rheumatic diseases and list the diseases that constitute this group;
- The basics of the etiopathogenesis of rheumatic diseases;
- The morphogenesis of rheumatic diseases;
- The main clinical-anatomical forms of rheumatism;
- The pathological-anatomical diagnosis of various forms of rheumatic endocarditis, myocarditis, and pericarditis based on their macroscopic and microscopic characteristics;
- The complications and outcomes of various forms of rheumatism;
- The pathomorphological features of rheumatoid arthritis.

Be able to:

- Identify major general pathological processes and diseases using histological specimens under light microscopy;
- Diagnose pathological processes and diseases based on the description of macroscopic and microscopic changes in organs and tissues of the body.

***Master*:**

- Basic techniques for working with a microscope;
- Skills in clinical-anatomical analysis;
- The fundamentals of synthetic generalization of morphological diagnostic signs of diseases and their correct interpretation in cause-and-effect relationships.

Motivation for Mastering the Topic:

In recent decades, rheumatic diseases have attracted attention worldwide – in developing countries due to high rates of primary morbidity and mortality from heart valve defects, and in developed countries due to the prevalence of chronic joint and spinal diseases accompanied by temporary and permanent disability. According to summarized WHO data, more than 30% of cases of temporary disability and 10% of total disability are caused by rheumatic diseases. Statistical data obtained from various countries around the world indicate the undeniable significance of rheumatic diseases for public health, since 16% to 23% of the population over the age of 15 suffer from various diseases in this group. Despite a continuous decline in mortality from rheumatism, the great social significance of rheumatic diseases is determined not only by their prevalence but also by the development of temporary and permanent disability (invalidity) in a significant number of patients, primarily at a young age: the average age of disabled individuals suffering from rheumatism is 40–43 years, ankylosing spondylitis – 44–47 years, and rheumatoid arthritis – 52 years.

Knowledge of the morphological features of rheumatic diseases as the structural basis of their pathogenesis is necessary for physicians of various specialties to be able to competently and promptly establish a diagnosis, provide

effective therapy, and ensure the prevention of the development of these diseases and/or their recurrences.

QUESTIONS

1. Rheumatic heart disease. Definition. Etiology. Pathogenesis. Classification. Morphology. Complications and outcomes. Rheumatic myocarditis. Rheumatic granuloma.
2. Periarteritis nodosa. Definition. Etiology. Pathogenesis. Classification. Morphology. Complications and outcomes.
3. Rheumatoid arthritis. Definition. Etiology. Pathogenesis. Classification. Morphology. Complications and outcomes.
4. Sjogren's syndrome. Definition. Etiology. Pathogenesis. Classification. Morphology. Complications and outcomes.
5. Systemic lupus erythematosus (SLE). Definition. Etiology. Pathogenesis. Classification. Morphology. Complications and outcomes.
6. Ankylosing spondylitis. Definition. Etiology. Pathogenesis. Classification. Morphology. Complications and outcomes.
7. Systemic scleroderma (SSD). Definition. Etiology. Pathogenesis. Classification. Morphology. Complications and outcomes.
8. Dermatomyositis. Definition. Etiology. Pathogenesis. Classification. Morphology. Complications and outcomes.

COURSE OF THE SESSION

The concept of "**rheumatic diseases**" (aka collagen diseases) includes diseases of various origins, predominantly systemic, occurring with persistent or transient **articular syndrome**.

A number of collagen diseases may result in **chronic interstitial fibrosis** and **destruction of blood vessels**.

All rheumatic diseases are characterized by common features:

- systemic disorganization of connective tissue
- impairment of microcirculatory bed vessels
- impairment of immune homeostasis
- chronic progressive wavy course of pathologic process
- positive effect of corticosteroid therapy

The theoretical justification for combining these numerous diseases into one group was the fact that they are based on a **predominant damage of the connective tissue**.

Currently, this group of diseases include:

- rheumatism (rheumatic fever)
- rheumatoid arthritis (RA)
- systemic lupus erythematosus (SLE)
- systemic scleroderma (SSD)
- periarteritis nodosa and other systemic vasculitis
- dermatomyositis
- Sjogren's syndrome
- ankylosing spondylitis

Rheumatic diseases are characterized by:

1. The presence of a **chronic focus of infection**.
2. Violations of immune homeostasis, represented by immediate hypersensitivity reactions with the development of **exudative-necrotic manifestations** and delayed hypersensitivity reactions with the **formation of cellular infiltrates**.
3. **Generalized vasculitis** that occurs in the microcirculatory vessels. Capillaritis, venulitis and arteriolitis can be destructive (manifestation of the IHR) and proliferative.
4. **Systemic progressive disorganization of the connective tissue**, represented by mucoid swelling, fibrinoid changes, cellular reactions and sclerosis.
5. **Chronic undulating course** with alternating periods of exacerbations and remissions.

Rheumatism is a systemic inflammatory disease of the connective tissue with a predominant localization of the process in the **cardiovascular system**, developing after an acute infection (group A beta-hemolytic streptococcus) in predisposed individuals, mainly children and adolescents (7-15 years old).

Rheumatism for a long time (until the end of the 18th century) was regarded as a purely articular lesion.

Pitcairn was the first to suggest the presence of heart damage, **Sokolsky** and **Bouillaud** were the first to describe rheumatic valvulitis, **Polunin** – myocarditis, **Romberg** – granulomas and damage to the coronary vessels, **Aschoff** – re-discovered granulomas, considering them the result of the introduction of some kind of infection, **Talalaev**, studying the process in dynamics proved that initially the disorganization of the connective tissue develops, and then the granuloma is formed.

Rheumatism

Despite the fact that neutrophil polymorphonuclear leukocytes have an increased tropism for streptococcus, **phagocytosis in them is incomplete**, which leads to **long-term persistence of the antigen in the body** and leads to the depletion of the immune system.

In the latter, breakdowns occur, especially since the process is accompanied by damage to the thymic reticuloepithelium, leading to the development of T-helper deficiency.

As a result, the **production of antibodies** against the streptococcal antigen **is insufficient**.

Circulating immune complexes (CIC) cause **damage to the microcirculatory vessels** with the development of staged reactions.

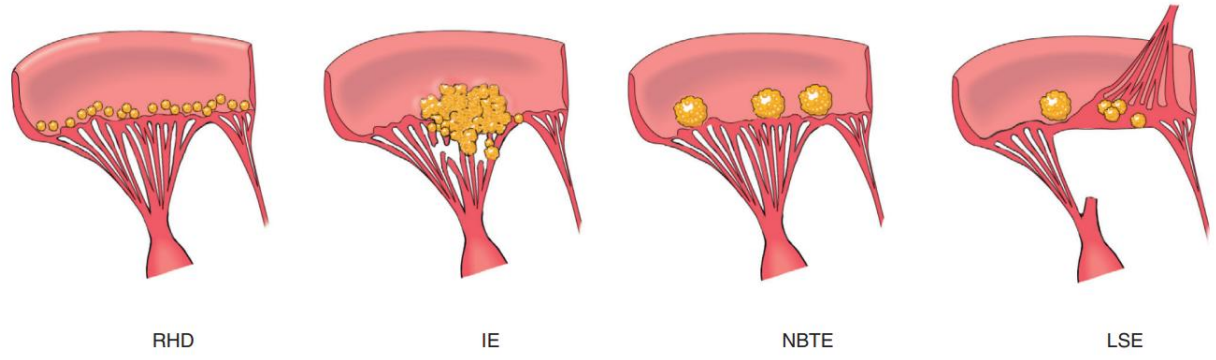
CICs induce immediate-type hypersensitivity reactions, and autoantigens are formed from damaged tissues with the development of delayed-type hypersensitivity reactions.

Cardiovascular form of rheumatism

1. **Endocarditis**, according to localization can be:

a) valvular, b) parietal, c) chordal

In terms of the frequency of valve damage, the **mitral valve** ranks 1st (65-70%), the 2nd place is the **simultaneous damage of the mitral and aortic** valve (25%), the 3rd place is the **aortic valve** (5-10%).



Endocarditis morphology

a) **simple endocarditis** (Talalaev 's valvulitis) - foci of mucoid and fibrinoid swelling appear in the thickness of the endocardium. With timely adequate therapy, the process is reversible, only a slight thickening may remain

b) **acute warty endocarditis** - develops on an unchanged valve, erosions form along the closure line of the valves, fibrin is deposited on them, followed by

organization; there is a gradual sclerosis of the valve, and as a result, vascularization develops

c) **recurrent warty endocarditis** - develops on a modified valve with repeated attacks of rheumatism. In this case, fusion of the valves along the closure line and sclerosis of the free edge + shortening of the chordal tendons can be observed, resulting in stenosis and/or valve insufficiency.

d) **fibroplastic endocarditis** - according to modern concepts, it is not the outcome of diffuse endocarditis, but is an independent form that is observed in protracted and latent forms of rheumatism, when mucoid and fibrinoid changes in the valve are minimal, but fibroplastic reaction is pronounced. The valve gradually thickens and shortens - valve insufficiency develops in its pure form.

Rheumatic myocarditis

Myocardial damage - myocarditis, can be **exudative** and **granulomatous**.

Morphological variants of rheumatic myocarditis:

- nodular, productive (granulomatous);
- diffuse interstitial exudative;
- focal interstitial exudative.

Nodular productive myocarditis is characterized by the formation of **rheumatic granulomas** in the perivascular connective tissue of the myocardium. Granulomas are scattered throughout the myocardium, most of them occur in the left atrial appendage, in the interventricular septum, and in the posterior wall of the left ventricle.

In the center of a mature granuloma there is a focus of **fibrinoid necrosis**, along the periphery – large histiocytes known as **Anichkov cells**.

Exacerbation of myocarditis with rheumatism can lead to **acute heart failure**. As a result, **diffuse cardiosclerosis** develops.

Rheumatic pericarditis

Pericarditis can be **serous** and **fibrinous**.

In the outcome of pericarditis, exudate is organized with the **formation of adhesions**. Sometimes there is a complete **obliteration of the pericardial cavity** with calcification of fibrinous deposits.

Vascular lesions. Microcirculatory vessels are the most affected with the development of various kinds of vasculitis (exudative, productive).

In large vessels, the first changes develop in the vasa vasorum.

Rare forms of rheumatism

Polyarthritic form

Predominantly large joints suffer, clinical manifestation is observed in the exudative form. The peculiarity lies in the fact that **articular cartilage is never affected**, therefore, ankylosis does not develop (as in rheumatoid arthritis). In the periarticular tissue, fibrinoid foci with a lymphoid and macrophage infiltration are observed, resembling rheumatic granulomas (rheumatic nodules).

Cerebral form

Rheumatic lesion occurs in 2 variants: a) **rheumatic vasculitis** with corresponding circulatory disorders and clinic; b) **chorea minor** - a neurological

disorder with involuntary, aimless, rapidly occurring movements. Vessels are usually not involved.

In addition, vasculitis can develop at any age, chorea - only in children.

Nodose form

It is characterized by the appearance of painless nodules under the skin in the periarticular tissues of. These nodules consists of fibrinoid necrosis, surrounded by lymphoid-macrophage infiltrate (the structure resembles Aschoff-Talalaev granulomas). Erythema appears in the skin in the form of a limited, slightly raised, reddish papule spot, which progressively increases. Sometimes small scars remain in place of the nodules.

Rheumatism

Features of **rheumatism in children**:

1. Along with endocarditis, frequent involvement in the inflammatory process of the myocardium

2. The predominance of exudative forms.

3. Damage to the central nervous system. Chorea minor is a sad privilege of children.

Complications of rheumatism are more often associated with damage to the heart. Endocarditis can serve as a source of **thromboembolism** of the vessels of the systemic circulation, which leads to **infarctions** in kidneys, spleen, brain, gangrene of the extremities, etc. Adhesive processes in the cavities (obliteration of the pleural cavity, pericardium) can also become a complication of rheumatism.

Rheumatoid arthritis is a chronic systemic connective tissue disease with a **progressive damage of joints** in the form of erosive-destructive polyarthritis.

Etiology and pathogenesis. Connective tissue damage (mainly joints) is a consequence of immunopathological processes (autoaggression).

Viral infections play the main role, especially the **Epstein-Barr virus**, which has the ability to disrupt the synthesis of immunoglobulins.

The role of **genetic factors** is confirmed by an increase in the incidence of RA in relatives of patients and monozygotic twins.

Morphology. The pathological process develops mainly in the joints and periarticular tissues . The **inflammatory process** in the synovial membrane becomes chronic and is accompanied by the **destruction of cartilage** with the subsequent development of **fibrous and bone ankylosis**. The process is staged.

Morphological stages of RA

1. The **early stage** is characterized by an increase in vascular tissue permeability, edema, hyperemia, mucoid and fibrinoid swelling, and the development of fibrinoid necrosis. In the vessels, there is a **productive vasculitis**, and **thrombovasculitis**. **Synovial hyperplasia** is observed.

2. The next stage is characterized by the **growth of granulation tissue** in the subsynovial layer, rich in blood vessels, lymphoid and plasma cells. There is a focal, often perivascular, lymphocytic infiltration. Granulation tissue growing from the sides of the synovial membrane creeps onto the cartilage in the form of a pannus.

The **cartilage breaks down** with the formation of usurations, fissures, and sequesters plunging into the subchondral bone. Macroscopically, dryness, graininess of the cartilaginous surface, yellowness, sometimes complete destruction of the articular surfaces are noted.

3. In the **final stage**, the maturation of granulation tissue leads to the fact that the damaged **articular surfaces are covered with fibrous tissue**, converge, the joint space narrows, and **fibrous adhesions** form. The simultaneous growth of bone beams with their transition from one end of the joint to the other leads to the formation of **fibro-osseous ankylosis**.

Systemic lupus erythematosus (SLE), or Libman-Sacks disease, is a chronic disease of connective tissue with **expressive autoimmunization** and predominant damage of **skin, vessels** and **kidney**.

Mostly **young women** suffer (90%) from SLE. SLE is the classical example of systemic autoimmune or collagen diseases.

*The classic diagnostic triad is **dermatitis**, **arthritis**, **polyserositis**.*

The disease derives its name "lupus" from the Latin word meaning "wolf" since initially this disease was believed to affect skin only and eat away skin like a wolf.

However, now 2 forms of lupus erythematosus are described:

1. **Systemic** or disseminated form is characterized by acute and chronic inflammatory lesions widely scattered in the body and there is presence of various nuclear and cytoplasmic autoantibodies in the plasma.

2. **Discoid** form is characterized by chronic and localized skin lesions involving the bridge of nose and adjacent cheeks without any systemic manifestations. Rarely, discoid form may develop into disseminated form.

Pathology of SLE

The manifestations of SLE are widespread in different visceral organs as well as show erythematous cutaneous eruptions. The principal lesions are **renal**, **vascular**, **cutaneous** and **cardiac**; other organs and tissues involved are serosal linings (**pleuritis**, **pericarditis**); joints (**synovitis**); spleen (**vasculitis**); liver (**portal triaditis**); lungs (**interstitial pneumonitis**, **fibrosing alveolitis**) and CNS (**vasculitis**).

Histologically, the characteristic lesion in SLE is **fibrinoid necrosis** which may be seen in the connective tissue, **beneath the endothelium** in small blood vessels, under the mesothelial lining of pleura and pericardium, under the endothelium in endocardium, or under the synovial lining cells of joints.

Visceral manifestations of SLE are different. In 25% of cases heart damage is described with lesion of all their layers. In some patients a **non-infectious endocarditis** develops. There are **butterfly rashes** on the skin of face, **glomerulonephritis** with proteinuria and hematuria.

Pathology of SLE

Renal manifestations of systemic lupus erythematosus (SLE) are termed **lupus nephritis**. The incidence of renal involvement in SLE ranges from 40 to 75%. The two cardinal clinical manifestations of lupus nephritis are **proteinuria** and

hematuria. In addition, **hypertension** and casts of different types such as red cell casts, fatty casts and leucocyte casts in the urinary sediment are found.

Complications. The most dangerous complications are associated with kidney damage - the development of **kidney failure** on the basis of lupus nephritis.

Complications of steroid and cytostatic therapy are **purulent infections**, **hormonal disorders**.

Death occurs most often from kidney failure (uremia) or infection (sepsis, tuberculosis).

Systemic Sclerosis or Scleroderma

Just like SLE, scleroderma was initially described as a **skin disease characterized by progressive fibrosis**. Types of SSc:

1. **Diffuse scleroderma** in which the skin shows widespread involvement and may progress to involve visceral structures.

2. **CREST syndrome** of progressive systemic sclerosis characterized by Calcinosis (C), Raynaud's phenomenon (R), Esophageal hypomotility (E), Sclerodactyly (S) and Telangiectasia (T).

Etiopathogenesis. Immunologic mechanisms have been implicated in the pathogenesis of lesions in SSc which finally cause activation of fibroblasts.

The immune mechanisms leading to stimulation of fibroblasts:

1. Elaboration of cytokines such as by **fibroblast growth factor** and **chemotactic factors** by activated T cells and macrophages.

2. **Endothelial cell injury** due to cytotoxic damage to endothelium from autoantibodies or antigen-antibody complexes. This results in aggregation and activation of platelets which increases vascular permeability and stimulates fibroblastic proliferation.

Pathology of Systemic Sclerosis

Disseminated **visceral involvement** as well as **cutaneous lesions** are seen in systemic sclerosis.

1. **Skin changes**. Skin is involved diffusely, beginning distally from fingers and extending proximally to arms, shoulders, neck and face. In advanced stage, the fingers become claw-like and face mask-like.

Microscopically, changes are progressive from early to late stage.

- Early stage shows **edema** and **degeneration of collagen**. The small sized blood vessels are occluded and there is perivascular infiltrate of mononuclear cells.
- Late stage reveals **atrophy of epidermis**. Dermis is largely replaced by compact collagen and there is hyaline thickening of walls of dermal blood vessels. In advanced cases subcutaneous calcification may occur.

2. **Kidney changes**. Involvement of kidneys is seen in majority of cases of SSc. The lesions are prominent in the walls of interlobular arteries which develop changes resembling malignant hypertension. There is thickening of tunica intima due to concentric proliferation of intimal cells and fibrinoid necrosis of vessel wall.

3. Smooth muscle of **GIT**. **Muscularis** of the alimentary tract, particularly esophagus, **is progressively atrophied** and replaced by fibrous tissue.

4. Skeletal muscle. The interstitium of **skeletal muscle shows progressive fibrosis** and degeneration of muscle fibres with associated inflammatory changes.

5. Cardiac muscle. **Sclerosis of interstitium of the heart** may result in heart failure.

6. **Lungs**. **Diffuse fibrosis** may lead to contraction of the lung substance. There may be epithelium-lined honeycombed cysts of bronchioles. The lungs are involved in 80% cases of scleroderma. Interstitial pulmonary fibrosis is the most common form of pulmonary involvement. The disease usually involves the lower lobes and subpleural regions of the lungs and may lead to honeycombing of the lung. There is increased risk of development of cancer of the lung in pulmonary fibrosis in scleroderma.

7. Small arteries. The lesions in small arteries show endarteritis due to intimal proliferation and may be the cause for **Raynaud's phenomenon**.

Polyarteritis nodosa - systemic **necrotizing vasculitis** of **small and medium-sized arteries** with the formation of aneurysmal protrusions. Mostly young men are affected, the incidence is 2-3 cases per 1 million people per year.

Etiology. Polyarteritis nodosa develops after acute respiratory (including streptococcal) infections, the introduction of vaccines, drug intolerance, etc. The hepatitis B virus is important, since 30% of patients have a high titer of the HBs antigen and antibodies to it.

Polyarteritis nodosa usually begins with fever, tachycardia, muscle pain, weight loss, lack of appetite, sweating.

Pathology of polyarteritis nodosa

The most characteristic morphological sign of polyarteritis nodosa is the damage of small and medium-sized muscular arteries in the place of their branching. A feature of polyarteritis nodosa is the **simultaneous damage to the vascular endothelium** (deposition of immune complexes), the **internal elastic membrane** (polymorphic cell inflammation - lymphoid cells, macrophages, epithelioid cells, neutrophils, fibroblasts) and **perivascular tissue** (cellular infiltration and scarring). These changes eventually lead to **vessel obliteration** and the **development of thrombi**.

The damage of the vessels of various internal organs determines the clinical manifestations. The most common symptom and cause of death of patients with polyarteritis nodosa is **glomerulonephritis** (80-90% of patients).

Damage to the nervous system in 50% of patients is manifested by **multiple asymmetric sensory and motor neuritis** due to a pathological process in the vessels that feed the nerves. Involvement in the CNS process is clinically manifested by the symptoms of **meningoencephalitis**.

Abdominal syndrome is observed in approximately 50% of patients with polyarteritis nodosa and it is characterized by acute abdominal pain associated with the pathology of the mesenteric arteries, causing the development of intestinal necrosis.

Dermatomyositis

As the name suggests, this disease is a combination of **symmetric muscle weakness** and **skin rash**.

Etiopathogenesis. Immunologic hypothesis has been proposed. The affected muscles are infiltrated by sensitized T lymphocytes of both T-helper and T-suppressor type which are considered to bring about inflammatory destruction of muscle. Viral etiology due to infection with **coxsackie B virus** has also been suggested.

Pathology. The skeletal muscles usually affected are of pelvis, shoulders, neck, chest and diaphragm. **Interstitial pneumonitis** and **interstitial fibrosis** commonly accompany dermatomyositis and polymyositis.

Histologically, **vacuolization** and **fragmentation** of **muscle fibers** and numerous inflammatory cells are present. In late stage, muscle fibers are replaced by fat and fibrous tissue.

It is a **multisystem disease** characterized by muscle weakness, skin rash, typically with heliotropic erythema and periorbital edema, dysphagia due to involvement of pharyngeal muscles and respiratory dysfunction.

Bekhterev's disease

Ankylosing spondylitis or **Bekhterev's disease** is a chronic systemic disease of the joints with a predominant localization of the process in the **sacroiliac joints, joints of the spine and paravertebral soft tissues**.

In the tissues of the small joints of the spine and intervertebral discs, **destructive-inflammatory changes** occur, similar to changes in rheumatoid arthritis.

Characterized by **metaplasia of the connective tissue into the bone** with the development of bone ankylosis of the joints.

Heart and lung function may be impaired, and pulmonary hypertension sometimes develops.

Sjogren syndrome

Sjogren syndrome is a systemic autoimmune connective tissue disease with a primary lesion of the **secreting epithelial (exocrine) glands** of the body.

Sjogren syndrome is characterized by the **triad** of

1) dry eyes (**keratoconjunctivitis sicca**),

2) dry mouth (**xerostomia**), and

3) **rheumatoid arthritis**.

The combination of the former two symptoms is called **sicca syndrome**.

Etiopathogenesis. Antinuclear antibodies are found in about 90% of cases; test for rheumatoid factor is positive in 25% of cases. The lesions in lacrimal and salivary glands are mediated by T lymphocytes, B cells and plasma cells.

Pathology. In early stage, the lacrimal and salivary glands show **periductal infiltration by lymphocytes and plasma cells**. In late stage, glandular parenchyma and ducts are replaced by fat and fibrous tissue, and are hyalinized.

The disease is common in **women in 4th to 6th decades** of life

Sjogren syndrome

Etiology
Secondary form associated with RA, PBC

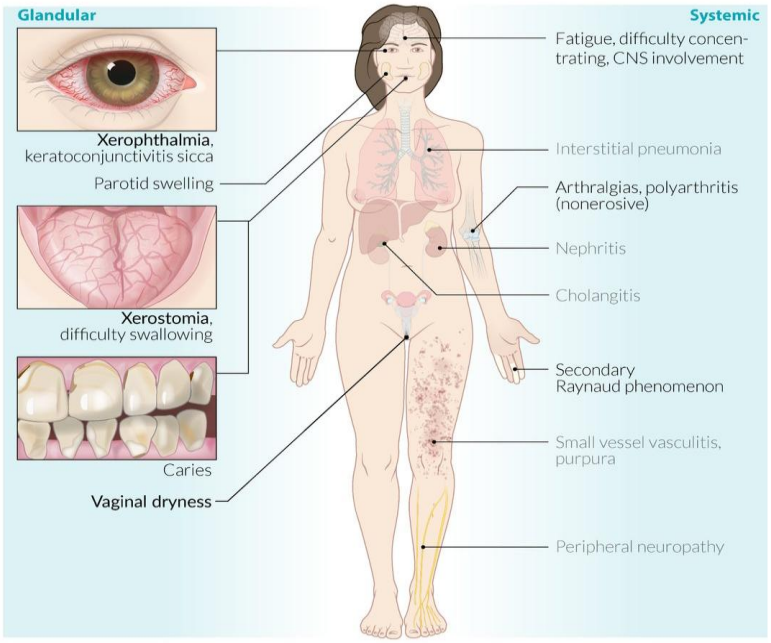
Epidemiology
♀ >> ♂

Antibody serology
Anti-Ro/SSA antibody and anti-La/SSB antibody, Rheumatoid factors

Complications
Lymphadenopathy, increased risk of B-cell lymphoma

Cardinal symptoms
Sicca symptoms: dry mouth, dry eyes

Note
transplacental transmission possible!



INFORMATIONAL AND METHODOLOGICAL PART

MAIN LITERATURE

1. Pathomorphology : textbook / ed. by I.V. Sorokina, V.D. Markovskyi, D.I. Halata. - 2nd ed. - Kyiv : AUS Medicine Publishing, 2020. - 327 p., [10] col. inserts : tab.

2. Klatt, E. C. Robbins and Cotran Atlas of Pathology : [with Student Consult Online Access] / Edward C. Klatt. - third edition. - Philadelphia : Elsevier, 2015. - 587 p. : il.

3. Robbins Basic pathology / [ed. by] Vinay Kumar, Abul K. Abbas, Jon C. Aster. - 9th ed. - [Philadelphia] : Elsevier ; Saunders. - 910 p. : ill., scheme, tab.

ADDITIONAL LITERATURE

1. Sobotta. Atlas of human anatomy. [V. 1]. General anatomy and musculoskeletal system / ed. by F. Paulsen, J. Waschke. - 15th ed. - München : Elsevier. Urban & Fischer, 2011. - 400 p. : ill., col. ill.

2. Sobotta. Atlas of human anatomy. [V. 2]. Internal organs / ed. by F. Paulsen, J. Waschke. - 15th ed. - München : Elsevier. Urban & Fischer, 2011. - 259 p. : ill., col. ill.

3. Sobotta. Atlas of human anatomy. [V. 3]. Head, neck, and neuroanatomy / ed. by F. Paulsen, J. Waschke. - 15th ed. - München : Elsevier. Urban & Fischer, 2011. - 370 p. : ill., col. ill.

4. Weir & Abrahams' imaging atlas of human anatomy / ed.: J. D. Spratt [and oth.] ; consultant eds.: J. Weir, P. H. Abrahams. – 5th ed. - [S.l.] : Elsevier, 2017. - xvi, 263 p. : ill.

NORMATIVE LEGAL ACTS AND DOCUMENTS

1. Order of the Ministry of Health of the Republic of Belarus No. 111 of 06/01/1993 "On further improvement of the pathological service of the Republic of Belarus"

Access mode: http://patan.by/menyu/administrativnyie-proczeduryi.html - The date fccess: 20.03.2022.

ELECTRONIC DATABASES

1. Physician's consultant. Electronic Medical Library = Consultant of the doctor. Electronic medical library [Electronic resource] / Publishing group "GEOTAR-Media", LLC "IPUZ". – Access mode: http://www.rosmedlib.ru/ . – Access date: 03/15/2022.

2. Springer Link [Electronic resource] / Springer International Publishing AG. – Access mode: https:link.springer.com. – Date of access: 03/15/2022.