

THESES
to prepare and conduct a practical training on:
Occupational diseases of the nervous and musculoskeletal
system
for students majoring in Medicine 3rd year, Faculty of
Medicine
Academic 2021/2022

Occupational musculoskeletal diseases (OMS)

ETIOLOGY OF OCCUPATIONAL MUSCULOSKELETAL DISEASES

- Dynamic physical activity (heavy physical work)
- Static physical activity
 - Motor monotony
 - Manual work with weights
 - Forced working posture, body position
 - Pace of work
 - Irrational labor movements
- Vibration
- Unfavorable microclimate, sudden temperature changes or prolonged hypothermia
- Toxic noxa
- Ionizing radiation

Pathogenesis of occupational musculoskeletal diseases

Fatigue with its specific biochemical, cellular and humoral changes

Aseptic inflammatory process of the interstitial spaces of muscles, joints, ligaments, tendons, etc.

Local autonomic dysregulation (changes in vascular tone, impaired blood circulation, exudation, impaired tissue metabolism)

Stretches, microruptures, ruptures of individual fibers of ligaments, insertions, muscles, etc.

Secondary degenerative changes (cell proliferation, necrosis of collagen structures, sclerotic changes)

Trophic disorders

Classification of occupational musculoskeletal disease:

MOST COMMON OCCUPATIONAL MUSCULOSKELETAL DISEASES

- Tendomyositis of the extensors of the arm
- Stenotic tendovaginitis of the first dorsal canal (de Quervain's disease); on the flexors of the fingers (trigger finger); paratenonitis of m. ext. carpi radialis
- Radial epicondylitis
- Shoulder periarthritis
- Cubital arthrosis, gonarthrosis, deforming arthrosis of the intraphalangeal joints of the hands
- Spondylosis - cervical, lumbo-sacral
- Aseptic necrosis of os lunatum, os scaphoideum
- Carpal tunnel syndrome, cubital canal syndrome, Guyon's syndrome

TENDOMYOSIS OF THE FOREARMEN

The damage is in the area of the musculoskeletal transition, most often affecting the extensor muscle group of the forearm.

Occupations at risk - weavers, hand knitters, fitters, seamstresses, typists, keyboardists, locksmiths, turners, masonry, formworkers, dentists, dental technicians and others.

Dorsal - extensor muscle group

- M. abductor pollicis longus
- M. anconeus
- M. brachioradialis
- M. extensor carpi radialis brevis
- M. extensor carpi radialis longus
- M. extensor carpi ulnaris
- M. extensor digiti minimi
- M. extensor digitorum
- M. extensor pollicis brevis
- M. extensor retinaculum

Ventral - flexor muscle group

- M. biceps brachii
- M. brachialis
- M. brachioradialis
- M. flexor carpi radialis
- M. flexor carpi ulnaris
- M. flexor digitorum superficialis

- M. flexor retinaculum
- N. medianus
- A. palmaris superficialis
- M. palmaris longus
- M. pronator teres
- **Clinical picture:**
- spontaneous **pain** (chronic) in the forearm, radially
- caused by pain in:
 - supination and pronation in the forearm
 - dorsal wrist extension against resistance (Thompson's symptom)
 - palpatory pain in the musculoskeletal system
- **swelling**
- increased **muscle density**
- **crepitation**
- **EMG** data for mild **myogenic changes** in the affected muscles
- **depressive-neurotic** tendencies due to chronic pain.
- **Differential diagnosis:**
- polymyositis, rheumatoid arthritis, rheumatic polymyalgia,
- menopausal arthropathy
- cervical osteoarthritis with root irritation and radiculopathy, etc.

RADIAL (LATERAL) EPICONDYLITIS

(insertion of arm extensors,
"tennis" elbow)

Occupations at risk: unloaders, hand presses, stonemasons, miners, molders, polishers, dental technicians, and other occupations with systemic forced (against resistance) extension of the wrist in a position of pronation in the extended and outstretched arm to the forearm.

Pathomorphological substrate:

- Aseptic inflammation and degeneration of the total insertion of mm. ext. carpi radialis br., ext. dig. comm., ext. dig. minimi, ext. carpi ulnaris and part of m. supinator, catching the humerus in the area of the radial epicondyle.

Clinical picture

- elbow **discomfort**
- **Spontaneous pain** of an unpleasant, burning nature with irradiation distally (more common) or proximal - to the neck.
- **Provoked pain** :
 - palpatory pain when pressure on the lateral epicondyle or muscle-tendon fibers 2-3 cm distal to it.
 - provoked pain in the elbow at dorsal flexion of the wrist and arm (in a fist) against resistance (**Thompson's symptom**).
 - provoked pain in the elbow during forced movement of the forearm from flexion and pronation to extension and supination (**Welsh symptom**)
- **impaired function** (muscle weakness, restricted movement, instability)
- **change in the relief of the damaged musculoskeletal structure**
- **Tension, edema** (pale, with fever)
- **Creptitations** (sometimes)
- **Radiologically** , when the process becomes chronic, there are calcium deposits and ossification in the area of the radial epicondyle zone.

The differential diagnosis

- Neuritis of the n. radialis
- Syndrome. of n.interosseus posterior
- Severe cervical osteochondrosis with vertebrogenic cervical radiculopathy
- Distal autonomic neuropathy of the arm

FINGER STENOSING TENOVAGINITIS ("Trigger finger ")

Thickening of the fibrous vaginas of the flexor tendons of the fingers and narrowing of their openings.

Compression of the tendon at the site of narrowing with proximal edema.

Impaired sliding of the tendon through the narrowed opening of the vaginal tendon when moving the finger from flexion to extension.

"TRIGGER FINGER "

Clinical picture

- **Pain** in the affected finger. The pain is overcome by passively straightening of the finger with the help of the other hand
- **The finger is locked** in a flexion position that is released by clicking.
- **Nodular painful thickening** at the base of the finger

Treatment – operation by longitudinal incision of the opening of the fibrous vagina of the affected flexor tendon.

DE QUERVAIN 'S DISEASE (radial styloid tenosynovitis)

Fibrosis of the tendons of m. abductor pollicis longus and m. extensor pollicis brevis

Thickening and narrowing of the canal below the transverse connection at the point where they pass over the apex of the processus styloideus radii.

Clinical picture

Pain when grasping and lifting objects

Spontaneous pain in the distal part of the forearm with irradiation to the thumb or proximal to the forearm.

Palpation pain on the processus styloideus radii and nodular seal.

Painful abduction of the thumb and ulnar deviation of the wrist

Impaired grip of the hand involving the thumb.

Finkelstein's **test is pathognomonic**

Treatment - tendon decompression

HUMERO-SCAPULAR PERIARTRITIS

- a collective term reflecting damage of the tendons, insertions, joint capsule, acromioclavicular joint and periarticular bursae or that means this term includes all structures around the shoulder joint.
- rupture of the tendon of m. supraspinatus
- tendinitis of m. supraspinatus or calcium deposits in the same muscle
- fracture of the large tubercle of the humerus or tenosynovitis of the caput longum m. bicipitis brachii
- deformations in the acromio-clavicular joint, in the intertubercular sulcus, in which the biceps tendon slides
- apophysitis coracoid processes
- apophysitis insertioni m. deltoidei - the place of capture on the humerus,
- subacromial bursitis
- subacromio-subdeltoid bursitis.

HUMERO-SCAPULAR PERIARTRITIS Etiology and pathogenesis

- repeated blows to the rotator cuff against glenohumeral joint structures
- degenerative changes of the tendons
- poor vascularization in the critical area of the articular surface of the tendon structures up to the insertion on the large tubercle, considering that the relative avascularity is positionally dependent when the shoulder is in adduction and that the vascular critical area are the anastomoses between muscle and bone vessels.
- The mechanical impact of a single movement of force at extreme over threshold loads,
 - Systemic effort in stereotypical, repeated movements with high frequency, hard work can cause stratification and structural changes of collagen fibrils with aseptic inflammation, impaired trophism and degeneration.
- **Frequency.** Shoulder pain is the third most common pain after lumbar and cervical spine pain syndromes, most commonly seen in people over 70 years of age.
- **Occupations at risk** : diggers, miners, pressers, unloaders, blacksmiths and others.

Clinical picture

- Pain during abduction movements (between 45 ° and 160 °), internal and external rotation
- Restriction of movements in the shoulder joint
- Discomfort and burning especially at night
- Weakness when lifting the shoulder
- crepitation
- pain in the cervical and middle thoracic spine.

Frozen shoulder syndrome - complete immobility in the joint due to a lesion of the joint capsule or local tendinitis. The frozen shoulder goes through three stages and lasts up to 3-4 years.

The glenohumeral joint is examined by fixing the scapula with the thumb and forefinger and abducting the hand

Neers ' symptom - the patient sits, the doctor stands, fixing the scapula with one hand so it can not rotate, and with the other hand raises the patient's arm forward with power, causing a blow of the large tuberosity against the acromion.

The pain is relieved when you apply 5cc of 1% xylocaine under the acromion in front side. Repeat negative test after 10 minutes.

It can be injected intracapsularly from 2.5 cm below the acromion in the direction of the coracoid tubercle.

Swallow scar. The doctor extends patient's arms as far as possible in the shoulder joints, and the patient must maintain this position after abrupt release. If there is a damage to n.axillaris and paresis of the m.deltoideus the arm falls and the position of both arms resembles a swallow's tail.

Investigation methods:

- Radiography
- Magnetic resonance imaging

Differential diagnosis :

- humero-scapular periartthritis of infectious origin
- adhesive capsulitis
- biceps rupture
- cervical spondylosis or osteochondrosis,
- reflex sympathetic dystrophy
- fibromyalgia
- myofasciitis
- osteoarthritis
- rheumatoid arthritis

- upper thoracic aperture syndrome and others.

OCCUPATIONAL BONE AND JOINT DISEASES

The most common ones:

cubital arthrosis, gonarthrosis, omarthrosis, aseptic necrosis of the scaphoid, os lunatum, os scaphoideum, os naviculare, radiocarpal arthrosis, arthrosis of the carpometacarpal joint of the thumb and interphalangeal joints;

limited cervical or lumbar spondylosis, also osteochondrosis (in young people up to 40 years of age); discopathy in the cervical or lumbar spine, disc protrusions in these areas, leading to symptomatic myalgias and radiculopathies.

Lumbar spine

Clinical picture

- Spontaneous and induced local pain
- Impaired function
- Swelling
- Deformation
- Immobilization
- Depressive-neurotic manifestations due to chronic pain
- Discogenic and vertebrogenic radiculopathies

Cervical part of the spine

Disc herniation C6-7

Spondylolisthesis

C6-7

Disc herniation C5-6

Upper thoracic aperture syndrome (excised scapular middle muscle and first rib)

CRITERIA FOR OCCUPATIONAL CONDITIONING OF MUSCULOSKELETAL DISEASES

- **sufficient average daily exposure to adverse production factors**

- **assessment of age, gender and harmful habits**
- **exclusion of previous injuries in the area of the damaged MS structure**
- **exclusion of concomitant somatic diseases or conditions with similar MS-injuries**
- **positive epidemiological test**
- **Exposure and elimination test**

SUMMARY

Degenerative changes in the bone and joint structures are discussed as occupational in people under 40 years of age and with prolonged exposure to occupational hazards.

TREATMENT OF OCCUPATIONAL MS-DISEASES

- **Regulation of motor activity (in relation to the damaged MS-structure)**
- **NSAIDs – locally and orally**
- **Analgesics**
- **Corticosteroids - sometimes combined with long-acting analgesics, anesthetics**
- **Physiotherapeutic procedures, exercise therapy**
- **Surgical treatment**