Definition, etiopathogenesis, clinical manifestations, nonpharmacological and pharmacological management of the diseases associated with Musculoskeletal disorders

Rheumatoid Arthritis (RA)

Definition:

- Rheumatoid arthritis is a chronic systemic autoimmune disease characterized by symmetric, inflammatory polyarthritis, primarily affecting the small joints and leading to progressive joint destruction, deformity, and extra-articular manifestations.

Etiopathogenesis:

Autoimmune Pathogenesis:

- Autoantibodies such as Rheumatoid Factor (RF) and Anti-CCP (cyclic citrullinated peptide) target the synovial membrane
- Inflammatory cytokines (TNF-α, IL-1, IL-6) drive synovitis
- Pannus formation (inflamed granulation tissue) erodes cartilage and bone

Risk Factors:

- Genetic: HLA-DR4, HLA-DR1
- Environmental: Smoking (strongest environmental trigger), infections
- Female sex (3:1 female to male ratio)
- Middle age onset (30–50 years)

Clinical Manifestations:

Articular Features:

- Symmetrical joint involvement
- Morning stiffness (>1 hour)
- Swelling, warmth, tenderness in small joints (MCP, PIP, wrist)
- Progressive deformities: ulnar deviation, swan neck, boutonnière deformity
- Reduced grip strength, limited range of motion

Extra-articular Features:

- Rheumatoid nodules

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- Fatigue, weight loss, fever
- Vasculitis, pleuritis, pericarditis
- Anemia of chronic disease
- Sjögren’s syndrome (dry eyes and mouth)
- Interstitial lung disease, scleritis

Non-Pharmacological Management:

- Physical therapy and occupational therapy
- Joint protection techniques and assistive devices
- Range of motion and strengthening exercises
- Smoking cessation
- Balanced anti-inflammatory diet (omega-3 fatty acids)
- Patient education and psychological support
- Surgical interventions for joint deformity or replacement in severe cases

Pharmacological Management:

1. NSAIDs:

- For symptomatic relief (pain and inflammation), e.g., ibuprofen, naproxen
- Do not halt disease progression

2. Corticosteroids:

- Oral or intra-articular (e.g., prednisone)
- Bridging therapy until DMARDs take effect

3. DMARDs (Disease-Modifying Antirheumatic Drugs):

- **Methotrexate (first-line)**
- Others: Sulfasalazine, Hydroxychloroquine, Leflunomide
- Require regular monitoring for liver, renal, and hematological toxicity

4. Biologics (for moderate to severe RA or methotrexate failure):

- TNF inhibitors: Etanercept, Adalimumab
- IL-6 inhibitors: Tocilizumab
- B-cell depleters: Rituximab
- T-cell modulators: Abatacept

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- Risk of infections (especially TB), hence screening before use

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Osteoarthritis (OA)

Definition:

- Osteoarthritis is a chronic, degenerative joint disease characterized by the progressive breakdown of articular cartilage, subchondral bone changes, and osteophyte formation, leading to joint pain and stiffness.

Etiopathogenesis:

Degenerative Mechanism:

- Mechanical stress and aging → cartilage breakdown
- Loss of proteoglycans and water content in cartilage
- Bone remodeling, sclerosis, and osteophyte (bone spur) formation
- Synovial inflammation may occur but is mild compared to RA

Risk Factors:

- Aging
- Obesity
- Joint trauma or overuse
- Congenital joint abnormalities
- Female sex (for hand and knee OA)
- Genetics

Clinical Manifestations:

- Joint pain worsened by activity and relieved by rest
- Morning stiffness (<30 minutes)
- Crepitus, reduced joint flexibility
- Bony swelling and tenderness
- Asymmetrical joint involvement
- Commonly affected joints: knees, hips, hands (DIP, PIP), spine
- Heberden's nodes (DIP) and Bouchard’s nodes (PIP)

Non-Pharmacological Management:

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- Weight reduction
- Low-impact exercises (swimming, cycling, walking)
- Physical therapy
- Muscle strengthening
- Use of orthotic supports, canes, braces
- Heat/cold therapy for pain
- Joint replacement surgery in severe OA

Pharmacological Management:

1. **First-line:**
   - **Paracetamol** for mild to moderate pain
2. **NSAIDs:**
   - Ibuprofen, naproxen for inflammation and moderate-severe pain
   - Topical NSAIDs preferred for localized OA
   - Gastroprotective measures for long-term use
3. **Intra-articular injections:**
   - **Corticosteroids** for acute flare-ups
   - **Hyaluronic acid** (controversial efficacy)
4. **Duloxetine:**
   - For chronic OA pain, especially if associated with depression
5. **Glucosamine/chondroitin:**
   - Widely used but mixed evidence on benefit

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