Definition

Chronic systemic inflammatory disorder affected synovium bone, cartilage, ligaments with extra-articular manifestations

RA is a chronic disease that leads to joint damage within the first 2 years, causes marked functional limitation and a 30% loss of work within the first 5 years, and shortens life by 5 to 7 years.

Rheumatoid factor (RF)

an immunoglobulin M (IgM) auto-antibody against the Fc portion of an IgG molecule first described by Waaler in 1940, is the main serologic marker, found in 75% to 80% of patients
Epidemiology

RA occurs throughout the world and in all ethnic groups. The prevalence is lowest in black Africans and Chinese, and highest in the Pima Indians of Arizona. In Caucasians it is around 1.0-1.5% with a female:male ratio of 3:1. Before the age of 45, the female:male ratio is 6:1. Prevalence increases with age, with 5% of women and 2% of men over 55 years being affected.

Etiology

Genetic factors:
- in RA are important in defining disease susceptibility and severity
- Family studies have demonstrated an increased risk for disease in siblings of persons affected with RA. Concordance in monozygotic has been found to be 12% to 15% and 4% in dizygotic twins strong evidence for a major influence of genetic factors in disease causation

Environmental:
- viruses (e.g., parvovirus B19, Epstein-Barr virus)
- Mycoplasma, and other bacteria (e.g., streptococci).
- Possible auto-antigens include type 2 collagen proteoglycan
- Chondrocyte antigens, heat shock proteins.
- Urbanization : has a major impact on incidence & severity of R.A.
- cigarette smoking
**Histopathology**

In the early months of RA, edema, angiogenesis, hyperplasia of synovial lining, and inflammatory infiltrate are already present. Once the disease enters a more chronic phase, massive hyperplasia, mainly of type A synovial cells, and subintimal mononuclear cell infiltration

The synovium of RA assumes the appearance of a reactive lymph node because of the extensive infiltration by plasma cells, macrophages, and lymphocytes in the form of large lymphoid follicles.

One characteristic feature of RA is the invasion of and damage to cartilage, bone, and tendons by an infiltrating inflammatory synovial tissue mass called the pannus.

**Clinical Characteristics of Rheumatoid Arthritis**

**Diagnosis of RA is made with four or more of the following**

- **Morning stiffness (> 1 hour)**
- Arthritis of three or more joint areas
- Arthritis of hand joints
- **Symmetrical arthritis**
- Rheumatoid nodules
- Rheumatoid factor seropositive (rheumatoid factor positive )
- Radiological changes
- **Duration of 6 weeks or more**
Joints Affected:
Typically involves elbows, wrists, MCP, and PIP joints
1st & 2nd cervical vertebrae frequently involved

Unaffected joints:
Thoracolumbar spine, DIPs & SI joints
Rheumatoid Arthritis: PIP Swelling
Swelling is confined to the area of the joint capsule.
Synovial thickening feels like a firm sponge.

Rheumatoid HAND
- An across-the-room diagnosis
- Prominent ulnar deviation in the right hand
- MCP and PIP swelling in both hands
- MCP subluxation
- Synovitis of left wrist

Rheumatoid arthritis: swan-neck and boutonnière deformity, hand-----------------------------→

Nonreducible flexion at the PIP joint with concomitant hyperextension of the DIP joint of the finger (boutonnière deformity, occurs as a consequence of synovitis with stretching of, or rupture of, the PIP joint through the central extensor tendon with concomitant volar displacement of the lateral bands.

Hyperextension at the PIP joint with flexion of the DIP joint (swan-neck deformity, may be initiated by disruption of the extensor tendon at the DIP joint with secondary shortening of the central extensor tendon and hyperextension of the PIP joint,
Rheumatoid arthritis: arthritis mutilans, hand (clinical and radiograph)

Rheumatoid arthritis: ruptured right popliteal cyst

25.58 How to calculate the DAS28 score

- Count the number of tender joints
- Count the number of swollen joints
- Measure the ESR
- Ask the patient to rate global activity of arthritis during the past week from 0 (no symptoms) to 100 (very severe)
- Enter data into an online calculator\textsuperscript{1} or work out using a formula\textsuperscript{2}

\begin{align*}
\text{DAS28} &= 0.56 \times \text{square root (tender joints)} + 0.28 \times \text{square root (swollen joints)} + 0.70 \times \log_{10}(\text{ESR}) + 0.014 \text{ (global activity score)}
\end{align*}

\textsuperscript{1}www.4s-dawn.com/DAS28.
\textsuperscript{2}
### Extra-articular manifestations of rheumatoid disease

<table>
<thead>
<tr>
<th>Systemic</th>
<th>Musculoskeletal</th>
<th>Haematological</th>
<th>Lymphatic</th>
<th>Nodules</th>
<th>Ocular</th>
<th>Vasculitis</th>
<th>Cardiac</th>
<th>Pulmonary</th>
<th>Neurological</th>
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</thead>
<tbody>
<tr>
<td>- Fever</td>
<td>- Muscle-wasting</td>
<td>- Anaemia</td>
<td>- Felty’s syndrome (see Box 25.56)</td>
<td>- Sinuses</td>
<td>- Episcleritis</td>
<td>- Digital arteritis</td>
<td>- Pericarditis</td>
<td>- Nodules</td>
<td>- Cervical cord compression</td>
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<td>- Weight loss</td>
<td>- Tenosynovitis</td>
<td>- Thrombocytosis</td>
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<td>- Scleritis</td>
<td>- Ulcers</td>
<td>- Myocarditis</td>
<td>- Pleural effusions</td>
<td>- Compression neuropathies</td>
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- Fatigue
- Susceptibility to infection
- Bursitis
- Osteoporosis
- Eosinophilia
- Splenomegaly
- Fistulae
- Scleromalacia
- Keratoconjunctivitis sicca
- Mononeuritis multiplex
- Visceral arteritis
- Conduction defects
- Caplan’s syndrome
- Bronchiolitis

### Box 25.56
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- Fatigue
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- Bursitis
- Osteoporosis
EXTRA-ARTICULAR MANIFESTATIONS OF RHEUMATOID DISEASE

Haematological

- Anaemia
- Thrombocytosis
- Eosinophilia

Lymphatic

- Splenomegaly
- Felty's syndrome

Ocular

- Eapiscleritis
- Scleritis
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Vasculitis

- Digital arteritis
- Ulcers
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Cutaneous features
- Subcutaneous rheumatoid nodules occur almost exclusively in seropositive patients, usually at sites of pressure or friction such as the extensor surfaces of the forearm, sacrum, Achilles tendon and toes

Laboratory Tests
- Raised inflammatory markers. Reasonable correlation with clinical activity
- Mild anemia & thrombocytosis
- S. Rheumatoid factor (Agglutination method). Positive in near 70-80% cases (western countries). Not specific
- Anti-CCP (citrulline – containing proteins) antibodies. Similar sensitivity to RF but more specific (up to 95%)

Examination of joint fluid
the most helpful laboratory procedure. The fluid is inflammatory, with more than 10,000 white blood cells and a predominance of polymorphonuclear leukocytes, typically 80% or more. Rheumatoid factor, an IgM antibody directed to IgG, is found in 80 to 90% of patients with RA.

XR-Findings
- Peri articular osteopenia
- Marginal erosions (at least months of persistent activity)
- Joint space narrowing (cartilage loss)
- Ankylosis (wrists)
- Deformities
Rheumatoid arthritis: subcutaneous nodule, olecranon

Rheumatoid arthritis: episcleritis

Rheumatoid arthritis: scleromalacia

Rheumatoid arthritis: scleromalacia perforans

Rheumatoid arthritis: scleromalacia perforans, herniation of the dark pigmented uveal tissue

Rheumatoid arthritis: vasculitis with small infarcts, fingers

Rheumatoid arthritis: vasculitis and gangrene, fingers

Rheumatoid arthritis: pulmonary nodules
Joint damage progression in R.A. hand

- Soft-tissue swelling, no erosions
- Thinning of the cortex on the radial side and minimal joint space narrowing
- Marginal erosion at the radial side of the metacarpal head with joint space narrowing

Prognosis

The following factors at presentation are associated with a poor prognosis: higher baseline disability

female gender

involvement of MTP joints

positive rheumatoid factor

disease duration of over 3 months.

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