RHEUMATOID ARTHRITIS—I: CLINICAL FEATURES AND DIAGNOSIS

M Akil, R S Amos

Factors associated with poorer prognosis in rheumatoid arthritis

- Insidious polyarticular onset
- Male patients
- Extra-articular manifestations
- Functional disability at one year after start of disease
- Substantially raised concentration of rheumatoid factors
- Presence of HLA-DR4
- Radiographic evidence of erosions within three years of start of disease

Rheumatoid arthritis is the commonest disorder of connective tissues and is an important cause of disability, morbidity, and mortality. Life expectancy is reduced by four years in men and by 10 years in women, though this reduction is accounted for by a minority of patients with more severe disease. Nevertheless, patients with this condition may be offered life insurance only on the basis of loaded premiums.

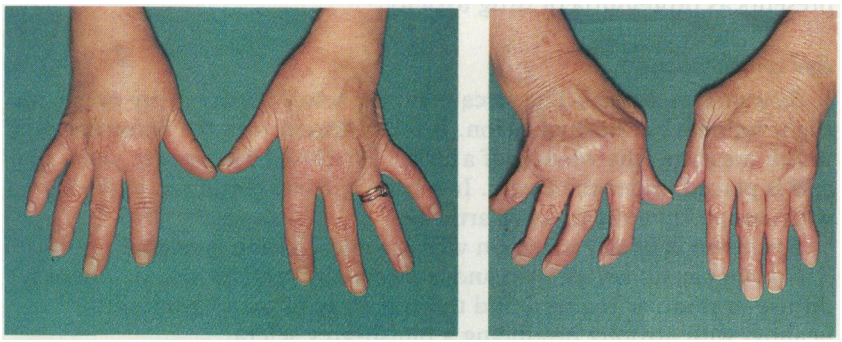
Rheumatoid arthritis occurs worldwide with variable incidence and severity. In Western countries, it affects up to 1-3% of the population, although many are not severely affected and may not seek medical advice at all. Overall, there is a 3:1 female preponderance, but this excess is greater in young people and the age related incidence is approximately equal in elderly people.

Rheumatoid arthritis in women

- Higher incidence of disease in women of child bearing age
- Disease tends to go into remission during pregnancy and to flare after giving birth
- Use of contraceptive pill or high gravidity adds some protection against later development of disease

The aetiology of rheumatoid arthritis remains unclear, but there is evidence of genetic predisposition to the disease. The presence of HLA-DR4 is significantly commoner among sufferers of rheumatoid arthritis who are white. Rheumatoid arthritis is associated with only certain subtypes of HLA-DR4 (HLA-Dw4 and HLA-Dw14); susceptibility is related to a shared epitope on the HLA molecule.

Clinical features



Effect of rheumatoid arthritis on the hand: (left) early changes and (right) later deformity.

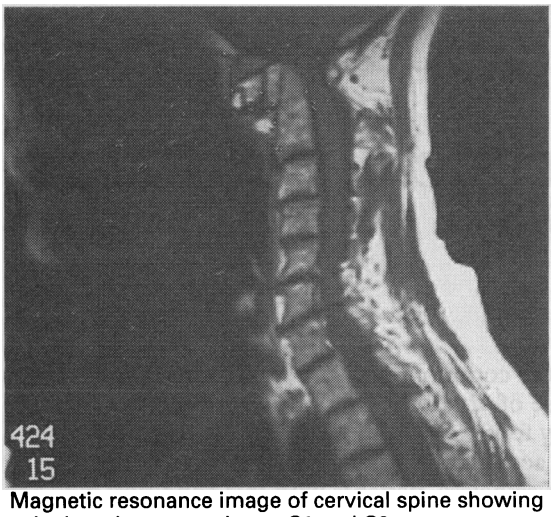
Joint damage

The start of the disease is usually insidious but can be episodic or acute. Rheumatoid arthritis usually presents as a polyarthritis affecting small joints or small and large joints. Early disease is characterised by pain and other cardinal signs of inflammation (heat, swelling, functional loss, and possible erythema over the joints) but not by damage and deformity. If the disease remains active and uncontrolled the inflammation will usually spread to additional joints and gradual irreversible tissue damage will occur, causing deformity and instability of joints. The most serious long term disability is associated with damage to the larger weight bearing joints.

Causes of impaired hand function in rheumatoid arthritis

- Active synovitis
- Joint deformity
- Rupture of tendon
- Carpal tunnel syndrome
- Mononeuritis
- Compression of nerve root at T1
- Compression of spinal cord

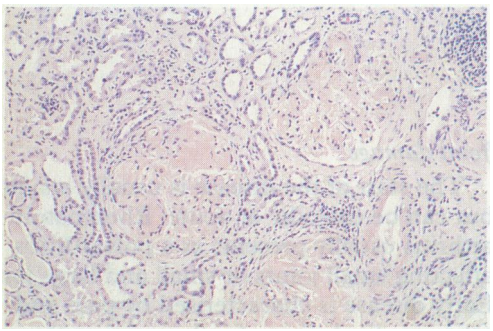
Inflammation of other synovial structures is common, and a similar process may occur in tendon sheaths, progressing to serious dysfunction and rupture. The typical rheumatoid deformities—such as ulnar deviation of the fingers, z deformity of the thumb, and swan neck and boutonnière deformities—are mostly due to damage or displacement of tendons. Palpable thickening or nodularity of tendons is common.

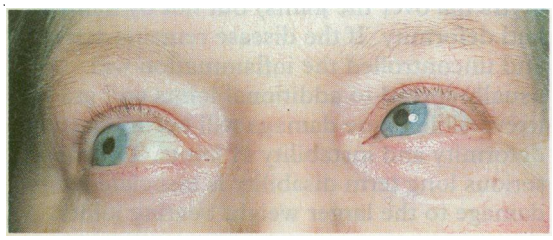


Magnetic resonance image of cervical spine showing spinal cord compression at C1 and C2.

Extra-articular manifestations of rheumatoid arthritis

- *Rheumatoid nodules*
- *Vasculitis*
- *Pulmonary*
  Pleural effusion
  Fibrosing alveolitis
  Nodules
- *Cardiac*
  Pericarditis
  Mitral valve disease
  Conduction defects
- *Skin*
  Palmar erythema
  Cutaneous vasculitis
  Pyoderma gangrenosum


Renal amyloid (Congo red stain).

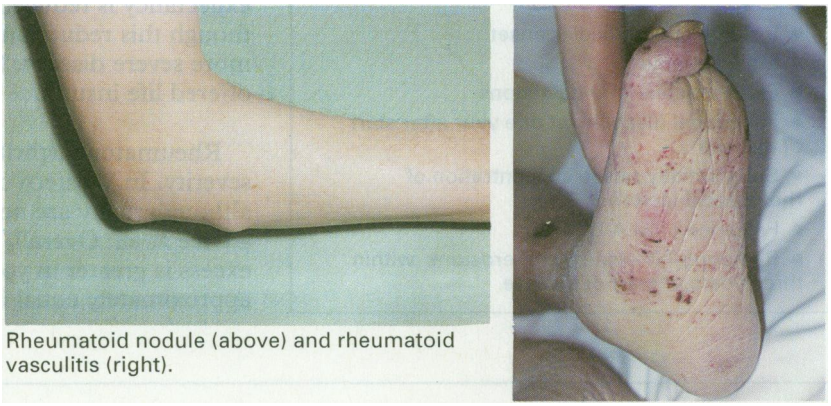

Scleritis associated with rheumatoid arthritis.

Complications of rheumatoid arthritis

- Joint failure causing physical disability
- Osteoporosis
- Depression
- Increased risk of infections
- Amyloidosis
- Complications of medical and surgical treatment

The spine—Although rheumatoid arthritis predominantly affects peripheral joints, discovertebral joints of the cervical spine are often affected. This may lead to atlantoaxial subluxation or, less commonly, subluxation at lower levels, with subsequent compression of the spinal cord. The earliest and most common symptom of cervical subluxation is pain radiating up into the occiput. Other symptoms include paraesthesia, sudden deterioration in hand function, sensory loss, abnormal gait, and urinary retention or incontinence.

Effusion of the knee may produce a popliteal (Baker's) cyst. This may rupture to cause diffuse pain and swelling in the calf that mimics deep vein thrombosis.


Rheumatoid nodule (above) and rheumatoid vasculitis (right).

Non-articular manifestations

Non-articular manifestations of rheumatoid arthritis are common. Rheumatoid nodules—which affect about a fifth of patients—may occur anywhere but are most common at sites of pressure, notably the extensor surfaces of the forearms and the posterior surface of the Achilles tendon.

A wide variety of other systems may be damaged by the rheumatoid process. Disease of small and sometimes larger blood vessels may be caused by deposition of immune complex in the vascular walls. This can lead to digital infarction, larger skin ulcers, and mononeuritis because of damage to the vasa nervorum.

Renal disease is rare but may occur as a result of amyloidosis, which presents as proteinuria or drug toxicity.

Eye complications

Sjögren's syndrome—The sicca complex results in dry gritty eyes with slight redness but normal vision. It is confirmed with the Schirmer test, which measures the wetting of a strip of sterilised filter paper when one end is placed under the eyelid. It is usually a late feature in women with seropositive rheumatoid arthritis.

Episcleritis is ocular irritation with nodules. Vision is normal.

Scleritis causes severe pain and occasionally reduces vision. There is diffuse or nodular redness, and the end stage of the condition is healing, with atrophy producing a bluish-grey sclera.

Felty's syndrome

This is a combination of seropositive rheumatoid arthritis (often with relatively inactive synovitis) with splenomegaly and neutropenia. It is associated with serious infections, vasculitis (leg ulcers, mononeuritis), anaemia, thrombocytopenia, and lymphadenopathy.

Neurological complications

These include entrapment of peripheral nerves (carpal tunnel, ulnar, lateral popliteal, tarsal, etc); mononeuritis multiplex; peripheral neuropathy—either associated with the disease or caused by drugs; compression of nerve roots; and compression of the cervical region of the spinal cord.

Investigations

Laboratory findings in rheumatoid arthritis

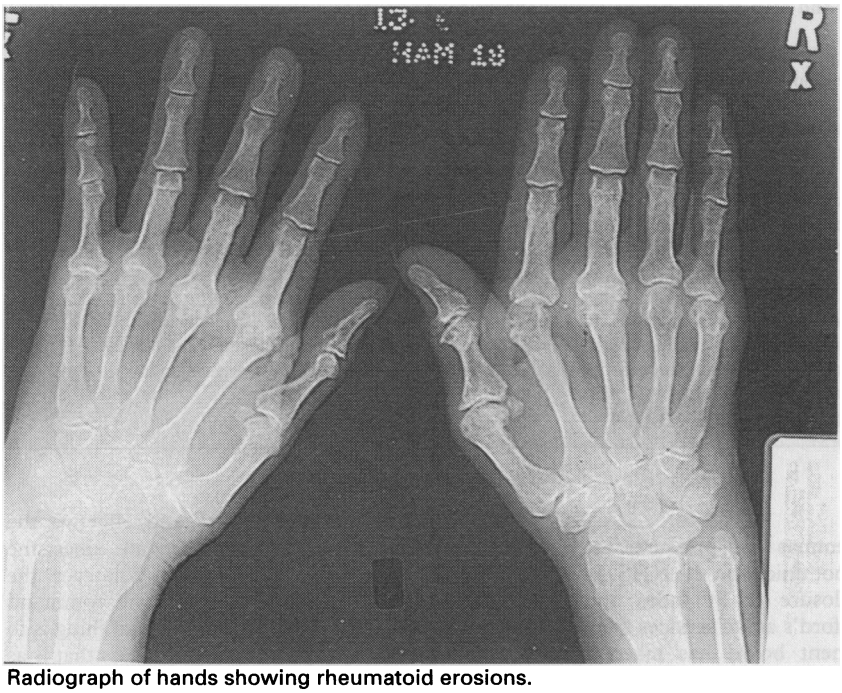
- Anaemia—normochromic or hypochromic, normocytic (if microcytic consider iron deficiency)
- Thrombocytosis
- Raised erythrocyte sedimentation rate
- Raised C reactive protein concentration
- Raised ferritin concentration as acute phase protein
- Low serum iron concentration
- Low total iron binding capacity
- Raised serum globulin concentrations
- Raised serum alkaline phosphatase activity
- Presence of rheumatoid factor

Other causes of positive test for rheumatoid factor

- Other connective tissue diseases
- Viral infections
- Leprosy
- Leishmaniasis
- Subacute bacterial endocarditis
- Tuberculosis
- Liver diseases
- Sarcoidosis
- Mixed essential cryoglobulinaemia

Causes of anaemia in rheumatoid arthritis

- Anaemia of chronic disease
- Iron deficiency—blood loss caused by non-steroidal anti-inflammatory drugs
- Suppression of bone marrow function—caused by sulphasalazine, penicillamine, gold, and cytotoxic drugs
- Folate deficiency—caused by sulphasalazine, methotrexate
- Vitamin B-12 deficiency—caused by associated pernicious anaemia
- Haemolysis—caused by sulphasalazine and dapsone
- Felty's syndrome



Radiograph of hands showing rheumatoid erosions.

Immune abnormalities

Rheumatoid factors are anti-immunoglobulins, and anti-IgG IgM is the immunological hallmark of rheumatoid arthritis. It is detected with the Rose-Waaler assay, but it is neither universally present in, nor specific for, rheumatoid arthritis: it is found in the sera of 80% of patients with rheumatoid arthritis, but the remainder are persistently seronegative despite otherwise typical disease. These patients may, however, be found to carry rheumatoid factors of other isotypes. The extra-articular features of rheumatoid arthritis are much commoner in patients with high concentrations of rheumatoid factor, but it is a poor guide to the severity of joint disease and to the success or otherwise of treatment.

Antinuclear antibodies may be present in some patients. The test for antinuclear antibody is widely used to screen for systemic lupus erythematosus, but it should be remembered that some patients with lupus will have positive tests for rheumatoid factor while some patients with rheumatoid arthritis will have positive tests for antinuclear antibody. Thus neither test is a universal diagnostic tool.

Indicators of acute phase response

A raised erythrocyte sedimentation rate (or plasma viscosity) and the presence of acute phase proteins such as C reactive protein are commonly found in patients with rheumatoid arthritis, especially when the disease is active. They reflect the severity of acute inflammation and thus may be a reasonable guide to the success of drug treatment, though they are not specific to rheumatoid arthritis. The disease is likely to progress if a raised erythrocyte sedimentation rate (or presence of C reactive protein) persists, but progression can still occur if they do not persist.

Liver function

Tests for liver function may give abnormal results in patients with rheumatoid arthritis. Serum concentrations of transaminases and alkaline phosphatase may be moderately elevated when the disease is active.

Radiography

Radiographs of the hands often are normal at presentation or may show swelling of soft tissue, loss of joint space, or periarticular osteoporosis. Erosions typical of rheumatoid arthritis develop within three years of the start of the disease in over 90% of patients who ultimately develop the erosions.

Unusual patterns of start of rheumatoid arthritis

- Palindromic
- Monoarthritic
- Asymmetrical
- Polymyalgic
- Oligoarthritic

Differential diagnosis of rheumatoid arthritis

Psoriatic arthritis—always seronegative
Primary nodal osteoarthritis
Other connective tissue diseases
Calcium pyrophosphate deposition disease

Symmetrical small joint polyarthritis, with or without large joints also being affected, is the commonest presentation. In elderly patients the start of rheumatoid arthritis may be indistinguishable from polymyalgia rheumatica. Occasionally, rheumatoid arthritis may present as a monoarthritis. Other conditions (such as infection, crystal arthritis, other inflammatory arthritis, etc) must be excluded before a diagnosis of rheumatoid arthritis is made.

Palindromic rheumatism is characterised by recurrent episodes of mostly oligoarticular arthritis that leave no residual clinical or radiological changes. Up to half of patients with this condition later develop typical rheumatoid arthritis, often accompanied by conversion to seropositivity for rheumatoid factor.

M Akil is registrar in rheumatology and R S Amos is consultant rheumatologist at Sheffield Centre for Rheumatic Diseases, Neither Edge Hospital, Sheffield.

The ABC of Rheumatology is edited by Michael L Snaith, senior lecturer in rheumatology at Nether Edge Hospital, Sheffield.

Management for Doctors

Managing change

Peter C Barnes

This is the ninth in a series of articles dealing with issues arising as clinical practitioners increasingly take on managerial roles. The series is edited by Jenny Simpson, chief executive, British Association of Medical Managers

Case study: rationalisation of hospital services

Henford General Hospitals Trust comprises a large teaching hospital, Henford General, on the periphery of the former district and a small hospital, St Judes, in a deprived inner city area. St Judes has served the local population well for over 100 years and has gained an excellent reputation.

Considerable opposition was mounted, unsuccessfully, to the closure of its accident and emergency department several years ago, to centralise the services on a single site at the main hospital. It has been understood for some time that a substantial development at Henford General would, at some stage, lead to the transfer of all services from St Judes and its subsequent closure. As a result, planning blight has afflicted St Judes and staff morale has plummeted.

Henford General Hospitals Trust has recently undergone major management reorganisation, leading to the introduction of clinical directorates, which have now been in existence for two years. Some very clear improvements in service have resulted from this development and the organisation as a whole has adjusted well to the cultural change. Nevertheless, the clinical directors still feel a conflict of loyalties between the needs of individual patients and the needs of the organisation as a whole, particularly when considering the difficult financial circumstances of the trust. Many are disappointed that their successes with efficiency savings have not led to direct benefit to their own services. Escalating costs, continued cost improvement programmes, uncertainty about purchaser intentions, and potential instability with regard to local fundholding general practitioners have all become part of the daily routine of the management of the trust which is under considerable pressure to balance its books. The regional health authority's plan for a shift of resources within the region using a weighted capitation formula shows that Henford District will be a relative loser and as a result will receive only the minimum increase in annual funding and have less growth money than in previous years. Although the hospital is used to experiencing considerable financial difficulties, the feeling in the main hospital is that crisis point has now been reached.

Early in the present financial year it became clear that the unit was heading for a major overspend that was unlikely to be met by marginal savings within each directorate. A task group was set up to look at the feasibility of an early transfer of all services from St Judes to Henford General to permit the closure of St Judes and the realisation of recurring revenue savings. Before the task group had completed its report considerable opposition to the move was voiced by staff at St Judes, led by two well respected clinicians, the Community Health Council, and members of the public who lobbied MPs and presented a petition objecting to the closure to the health secretary. Board members expressed anxiety that a premature closure of St Judes might lead to service reductions and jeopardise contract income and the future development of the trust. Nevertheless, after consideration of the task group's report which indicated the feasibility of transfer with minimum effect on services, they reluctantly recommended the transfer of services by the end of the calendar year.

Analysis

In the case cited the dilemmas and pressures are obvious and, unfortunately, not unique to the NHS. In recommending the early closure of St Judes and endeavouring to deliver Henford's acute services from a single site, the management board has taken a decision fraught with potential problems. How to proceed depends on how mature and effective the decision making structures have become since the development of clinical directorates. Whatever the decision, it is unlikely to be one which will command universal approval. In this situation the vital thing is to secure a decision making and change process that is as open as possible. This will not guarantee success but

Hope Hospital, Salford M6 8HD
Peter C Barnes, *consultant physician*

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