

Rheumatoid arthritis: symptoms, diagnosis, and management

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ABSTRACT Martin, L. (2004) Rheumatoid arthritis: symptoms, diagnosis, and management. *Nursing Times*; 100: 24, 40–44.

Rheumatoid arthritis is the most common inflammatory joint disease and a major cause of disability, morbidity, and mortality. It occurs worldwide, affecting approximately one per cent of adults. Inflammation of the synovial membrane surrounding a joint leads to swollen, tender, and stiff joints. This may be accompanied by fatigue, weight loss, anxiety, and depression. Nursing management goals should include the relief of symptoms, preservation of joint function, prevention of joint damage and deformity, maintenance of an acceptable lifestyle, and patient education. To achieve these aims the nurse should play a pivotal role within the multidisciplinary team, ensuring the highest quality of care.

This major cause of disability, morbidity, and mortality was named rheumatoid arthritis by Archibald Garrod in 1859. However, it is difficult to discover whether RA existed under different names before this. Landre-Beauvais published the first convincing description of RA in 1800, naming the disease 'la goutte asthenique primitive'. It is possible that the Byzantine emperor Constantine IX, who had a disabling and deforming joint disorder and died in 1055, had RA (Halberg, 1998).

However long this disease has been around, one thing is certain and surprising: what is known about RA is far

outweighed by what is unknown. What is new and exciting, though, is that recent advances in biotechnology have led to a greater understanding of RA pathogenesis, which in turn has led to innovative treatments. This may help to raise the profile of the disease globally because until now RA has often been considered the poor relation among medical conditions.

It is important not to confuse RA, a disease of the autoimmune system involving inflammation in the lining of the joint, with osteoarthritis, a disease caused by 'wear and tear' when the cartilage in the joint cannot cope with the loads placed on it.

Epidemiology

RA occurs worldwide, affecting approximately one per cent of adults. There is a higher incidence in females – the female to male ratio is approximately 3:1 – with the onset peaking between 40 and 50 years of age. RA has been reported in diverse populations, with a higher prevalence found in certain native Americans, a lower prevalence in rural Asian communities, and a total absence in parts of rural Africa.

Aetiology

The aetiology of RA is not clear. There is evidence of genetic susceptibility to the disease, with genetic markers such as the human leucocyte antigens identified as playing a role.

The presence of HLA-DR4 is significantly more common in people with RA than in those without the disease. Studies of families and twins show a small chance of RA

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BOX 1. THE 1987 AMERICAN COLLEGE OF RHEUMATOLOGY DIAGNOSTIC CRITERIA FOR RA

1	Joint stiffness in the morning	In and around joints, lasting more than an hour
2	Arthritis in three or more joint areas	Simultaneous soft tissue swelling or fluid
3	Arthritis in hand joints	Swelling of wrist, metacarpophalangeal or proximal interphalangeal joints
4	Symmetrical arthritis	Simultaneous involvement of the same joint areas on both sides of the body
5	Rheumatoid nodules	Subcutaneous nodules over bony prominences or extensor surfaces, or in juxta-articular regions as observed by a physician
6	Positive test for serum rheumatoid factor	As assessed by a method positive in less than five per cent of control subjects
7	Radiographic changes (osteoarthritic)	Erosions on posteroanterior hand and wrist X-rays changes alone do not qualify)

Note: at least four of the above seven criteria must be met for the classification of RA. Criteria 1–4 must have been present for at least six weeks.

being hereditary (MacGregor and Silman, 1998). Data from these studies shows that shared genetic or environmental factors may contribute towards developing RA.

Pathological features

The chief characteristic of RA is an immune-driven chronic inflammation of the synovial membrane. The synovial membrane surrounds the joint and produces synovial fluid that acts as a lubricant to aid smooth movement. The outer layer of the synovial membrane is called the capsule, which is made up of ligaments that hold the joint in place and prevent overactivity of the joint. When the synovial membrane is inflamed it may cause affected joints to become warm, swollen, tender, and stiff. It can lead to the synovial lining becoming continuous with vascular granulation tissue (pannus), which grows over the cartilage and in turn leads to erosion into the bone (Fig 1). The result is degeneration of the cartilage and, ultimately, the joint. Joint instability, subluxation (when there is partial dislocation, with the bone ends misaligned but still in contact), and deformity are the characteristic destructive changes associated with advanced RA (Isenberg and Morrow, 1995).

Clinical features

RA typically displays a pattern of symmetrical peripheral polyarthritis (joints on both the left and right side of the body are affected). Common sites include the metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints of the hand, wrist, knee, and foot. Examination of such joints reveals the soft and spongy swelling of synovitis, not to be confused with the hard knobby outgrowths of osteoarthritis. With the knee it may be more difficult to differentiate between the thick synovitis of RA and the thin wall effusion of osteoarthritis.

Other signs and symptoms of RA include:

- Fatigue;
- Joint stiffness in the morning lasting more than an hour;
- A general feeling of ill health or flu-like symptoms;
- Depression and anxiety.

In its early stages RA may be difficult to diagnose with certainty but an accepted list of diagnostic criteria was produced by the American College of Rheumatology in 1987 (Box 1) (Arnett et al, 1988).

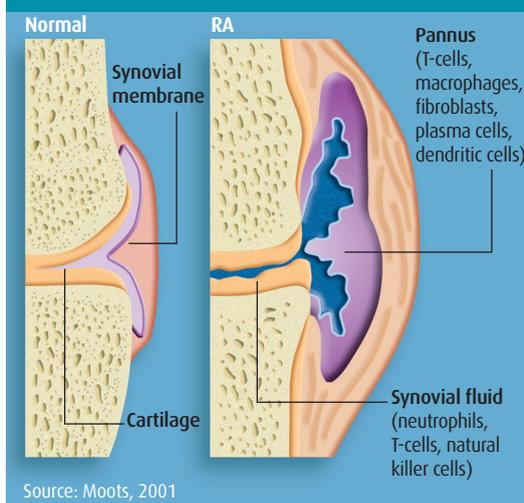
Investigations

There are no pathognomonic tests for RA but there are certain blood tests and X-rays that may support the diagnosis by adding to the overall picture as well as indicating the level of disease activity.

Rheumatoid factor (RhF)

Rheumatoid factor is an autoantibody, which means that it is an antibody that fights against one of the body's own components. Antibodies are proteins produced by the body in reaction to a substance that the body deems to be dangerous. A blood test for RhF may be positive in approximately 70–80 per cent of patients with RA and

FIG 1. A NORMAL SYNOVIAL JOINT AND THE MAJOR CHANGES IN A JOINT WITH RA



approximately five per cent of the general population. Up to one-third of RA patients do not have it and are termed sero-negative. Those in whom RhF is present are said to be sero-positive and this is often a more aggressive and erosive form of the disease than sero-negative RA.

A titre of 1:32 is classed as weakly positive and a titre greater than 1:64 may indicate more active disease. The main value of testing for RhF is in assessing the prognosis of early synovitis once it has been established clinically; it is not a quick way to diagnose RA.

Erythrocyte sedimentation rate (ESR)

The ESR is raised when there is inflammation but this is not specific to RA. It may be used to aid diagnosis as well as to monitor treatment efficacy. Usually, the ESR reflects disease activity and may be over 100mm/hr in cases of uncontrolled RA.

C-reactive protein (CRP)

This is a non-specific inflammatory marker that may be raised in the acute phase of the inflammatory response but may not rise if inflammation is mild. Severe and uncontrolled RA is usually accompanied by a consistently raised CRP.

Platelets

The platelet count may be elevated (thrombocytosis) in proportion to disease activity. A low platelet count (thrombocytopenia) may be due to drug therapy.

Haemoglobin (Hb)

This may be depressed in patients with RA (normochromic normocytic anaemia). Those with active RA with raised inflammatory markers may have an Hb of less than 10.0g/dL as a result of high disease activity. Anaemia is common but patients taking anti-inflammatories (which may cause gastrointestinal bleeding) are also at risk of developing iron deficiency anaemia on top of the anaemia related to chronic disease.

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This article has been double-blind peer-reviewed.

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Radiology

X-rays often appear normal in RA at presentation; later on, classical juxta-articular erosions may provide diagnostic information and help monitor the progression of the disease. Conventionally, hand and foot X-rays are used because in many patients the first signs appear in the metatarsal heads of the feet or in the metacarpophalangeal joints of the hands.

Treatment and management

The goals of treatment are:

- Relief of symptoms;
- Preservation of function;
- Prevention of structural damage and deformity;
- Maintenance of acceptable lifestyle;
- Patient education.

Patients need to have a realistic expectation of prognosis and treatment. This demands a multidisciplinary approach and apart from specialist nurses and consultant rheumatologists, other members of the team may include physiotherapists, occupational therapists, podiatrists, chiropodists, orthopaedic surgeons, and those able to give psychosocial support.

Information, education, and understanding of RA are of great importance and it is here that the nurse plays a major role (Le Gallez, 1998). Once the initial diagnosis is confirmed, time should be made available to discuss all aspects of the disease with the patient and the relevant treatment options. The patient should also be given written information as appropriate to digest at home.

The Arthritis Research Campaign supplies free booklets for patients and many rheumatology departments have developed their own patient information sheets. Arthritis Care and the National Rheumatoid Arthritis Society run self-management courses and expert patient programmes. Access to the latter may be available

through local patient advice and liaison services.

It is also important to emphasise that patients should pace themselves, creating a balance between exercise and rest. Acutely inflamed joints need rest but strong muscles help to protect joints. Maintaining a good range of movement is important. During an acute phase of RA rest is recommended, but once this has settled exercise of the joints with maximum range and minimum weight bearing is advised. Swimming, therefore, can be recommended as a good exercise for RA patients.

Within an inpatient or outpatient setting, nurses can collaborate with other health professionals to ensure patients receive the best possible care. Nurses can check that each patient is managing an exercise programme as agreed with the physiotherapist and advise on incorporating this into the patient's daily routine. Liaison with the occupational therapist about joint protection (which helps prevent damage to inflamed joints by reducing stress) or the provision of aids to the home is also important. Care of the feet of RA patients is of utmost concern and, apart from discussing footwear, referrals to the podiatrist, chiropodist or surgical fitter as appropriate should be instigated without delay by the nurse.

General medical or surgical ward staff may appreciate specific advice from the rheumatology nurse concerning the special needs of an inpatient with RA. This may include advice on:

- The handling of people with swollen and painful joints;
- Whether the patient requires special (higher) chairs or other furniture;
- Pain control;
- Skin care.

The latter needs to be highlighted as frail or older patients who have had lengthy courses of steroid treatment for their RA often have extremely thin and fragile skin that can bruise, tear or break down easily.

BOX 2. SOME COMMON SURGICAL PROCEDURES IN RA

- **Replacement arthroplasty:** replacement of an entire joint or part of a joint with an artificial prosthesis
- **Excision arthroplasty:** the ends of an articulating surface are excised, leaving a space that fills with fibrous tissue
- **Arthrodesis:** the fusing or fixation of joints for stability and pain relief
- **Decompression surgery:** for example, in carpal tunnel syndrome, when pressure is reduced on the median nerve
- **Tendon repair:** for ruptured tendons, most commonly found in the little and ring fingers and the thumb
- **Reconstruction surgery:** used for correcting joint deformities, such as in the hand

Surgery

Surgery in RA is commonly undertaken to relieve pain and restore function (Box 2). Mostly this is planned, as in joint replacements, but emergency surgery is indicated in the event of septic arthritis, ruptured tendons, or compression of nerves or the spinal cord.

Pharmacology

First-line drugs are purely for symptomatic control and thus include analgesics and NSAIDs. Until the 1990s, these were used after the initial diagnosis of RA, and second-line or disease-modifying antirheumatic drugs (DMARDs), also called slow-acting antirheumatic drugs (SAARDs), were introduced with caution months or even years later.

This approach has now been reversed as it is not felt to be acceptable to delay DMARD therapy, which both improves the symptoms of RA and helps to control the progression of the disease by suppressing joint inflammation (Box 3).

The outlook for the patient has therefore improved (Bensen, 1997; O'Dell, 1997).

BOX 3. SOME COMMONLY USED DMARDS

DRUG	SIDE-EFFECTS	MONITORING
Methotrexate	Nausea, gastrointestinal upset, rash, hair loss, mouth ulcers, hepatic fibrosis/ abnormal liver function tests (LFTs), acute fibrosing alveolitis, leucopenia	Baseline chest X-ray, full blood count (FBC), urea and electrolytes and LFTs; two-weekly for eight weeks and after each dose increase, and then monthly
Sulphasalazine enteric coated	Nausea, rash, neutropenia, abnormal LFTs	FBC and LFTs two-weekly for 12 weeks, then three-monthly
Leflunomide	Diarrhoea, rash, nausea, hair loss, hypertension, abnormal LFTs	Baseline blood pressure and at least monthly thereafter, FBC and LFTs two-weekly for 26 weeks and then monthly
Hydroxychloroquine	Rash, gastrointestinal upset, retinal toxicity	Baseline ophthalmological assessment and every 9–12 months thereafter
Intramuscular gold (sodium aurothiomalate)	Rash, mouth ulcers, proteinuria, pancytopenia, nephrotoxicity	FBC and urinalysis before each injection
Penicillamine	Rash, nausea, loss of taste, proteinuria, pancytopenia, myasthenia	Urinalysis and FBC two-weekly until dose stable, then monthly

DMARDS

Nowadays, DMARD treatment may be started quite quickly after the diagnosis has been confirmed, and maintained for a prolonged period.

Treatment is also sometimes referred to as 'aggressive' because modern management of RA often includes the use of multiple drugs, or combination therapy, to control the symptoms, suppress disease activity, and minimise joint damage.

Careful patient counselling and support needs to be given before and during administration of DMARDS. They are powerful drugs and can produce a range of side-effects. They must be monitored regularly for safety and efficacy. Ideally, shared-care protocols for DMARD monitoring allow safe and good communication between primary and secondary care. If funding permits, an even better situation is to have computerised systems transferring information between hospital and community. Patients should be given relevant written information about their DMARDS as well as a schedule of dose increase and blood monitoring as appropriate.

Analgesics

Patients using analgesics should be encouraged to take the smallest dose to control their pain but when needed they should be taken regularly. Compound analgesics such as co-codamol or co-proxamol are often used, but as with many pain-killing drugs care should be taken to monitor side-effects. These include nausea, vomiting, constipation, dizziness, and sleepiness. Some patients have to try several analgesics before finding one that suits them.

NSAIDs

NSAIDs are frequently prescribed in the treatment of RA because they can help to reduce joint pain and improve joint function. They work by suppressing the synthesis of prostaglandins by inhibiting cyclooxygenase (COX). When prostaglandins are induced, inflammation with its accompanying features of oedema, erythema, and warmth takes place. Prostaglandins also play a part in the gastric mucosa and in the regulation of renal blood flow. If the production of prostaglandins is suppressed by NSAIDs then these areas may be affected.

Recently, selective COX-2 inhibitors have been given approval for treating RA and osteoarthritis. Compared with non-selective NSAIDs they have a lower risk of causing serious gastrointestinal problems but renal side-effects may still occur.

Common gastrointestinal side-effects may include dyspepsia, indigestion, epigastric pain, nausea, and vomiting, ultimately leading to ulcers if the NSAID is not stopped or the symptoms treated.

Generally, patients taking any NSAIDs should be advised to take them with food and not to exceed the prescribed dose. Proton-pump inhibitors such as omeprazole or lansoprazole, which help control the production of gastric acid, may be prescribed to subdue any gastric symptoms caused by the NSAIDs.

Side-effects can also involve the liver, central nervous system, skin, respiratory system, and blood counts, thus emphasising the need for care with NSAID treatment and close monitoring of patients. As with analgesia, patients may need to try more than one NSAID to achieve a symptom control that is comfortable.

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Corticosteroids

Corticosteroids are commonly administered in three different ways:

- An injection directly into a joint (intra-articular), which can help to settle a flare;
- Intramuscular injections, which may be used alongside slower-acting DMARDs;
- Oral steroids, which are sometimes used on a regular basis with or without DMARDs.

There is some evidence to support the theory that low doses of steroids, in combination with second-line agents, reduce the rate of progression of joint damage in early RA (Akil and Amos, 1999). It is important that patients receiving steroids in any form understand the dosage and effects of this treatment.

Biological agents

Immunotherapy is now playing a rapidly growing role in the treatment of RA (Saravanan et al, 2004). Monoclonal antibodies and molecules targeted at tumour necrosis factor are increasingly being used in highly active disease, uncontrolled by other DMARDs. Infliximab, etanercept and adalimumab are anti-TNF agents, which bind to and neutralise human TNF, a cytokine important in the inflammatory process. Similarly anakinra blocks the action of another cytokine, interleukin-1. These agents also block the cytokines guarding against infection and malignancy, thus the risks and benefits of this therapy need to be explained carefully to potential recipients.

The long-term effects of these biological agents remain unknown. The cost is also a cause for discussion as it is nearing £10,000 per patient per year, but this should be compared with the indirect cost of RA, which may include loss of occupation and social care. The National Institute for Clinical Excellence and the British Society for Rheumatology have very specific guidelines for the use of biological agents (NICE, 2002).

Patient assessment

RA may result in severe disability and loss of independence. It is therefore important to be able to assess the status of an RA patient, to monitor treatment and decide if a change of therapy is indicated (Box 4). There are much-used and validated measures of function such as the Stanford Health Assessment Questionnaire (Bruce and Fries, 2003) and the short form 36 (Ware and Sherbourne, 1992). These self-completion questionnaires focus on function relating to daily living and psychosocial activities, as well as giving an indication of quality of life. The Disease Activity Score has been accepted as a valid instrument and is now widely used to judge disease severity, response to treatment, and to indicate need for adjustment (Van Gestel et al, 1998). It is very useful when assessing patients' eligibility for treatment with biological agents.

Conclusion

RA is a serious inflammatory disease requiring specialist care from the multidisciplinary team. Whether they are dealing with inpatients or outpatients, nurses play a

BOX 4. CASE HISTORY OF A PATIENT WITH RA

Susan Smith (not her real name) is 42 years old. In 1989 she was diagnosed with RA.

When Ms Smith was first seen by a consultant rheumatologist, she had experienced six months of pain and stiffness affecting her hands, feet, knees, and shoulders. On examination she had a markedly swollen left knee and stiff finger joints on both hands. She admitted to feeling very tired at times and having flu-like symptoms. Investigations showed a weakly positive rheumatoid factor, an erythrocyte sedimentation rate of 77, and haemoglobin of 8.3. The effusion in her left knee was aspirated and she was given a steroid injection into the joint. She was also started on NSAIDs and analgesics.

At this point Ms Smith was given leaflets about RA and its treatment. She was reluctant to contact the local arthritis group as she felt she would be younger than most and did not want to be labelled as disabled. She felt very isolated and often miserable.

Her left knee soon needed regular aspirations and injections. The symptoms in her other joints were worsening and X-rays showed the start of erosions in the metacarpophalangeal joints of her hands and metatarsal heads of her feet.

In 1991, Ms Smith began taking DMARDs. Sulphasalazine proved ineffective after four months and she changed to methotrexate. She was given appropriate leaflets and written schedules for dose increases and blood tests. In spite of improving her symptoms, methotrexate made her nauseous and resulted in headaches and abnormal liver function tests if she took more than 12.5mg weekly. There was also a dilemma over starting a family (methotrexate can harm the foetus). Eventually, she stopped the treatment and became pregnant. Her RA went into virtual remission lasting until her daughter was nearly one year old. Then the synovitis returned in both hands, feet, knees, and shoulders.

A return to teaching was impossible. She needed an arthroscopy and wash-out in 2000.

Then in 2002, Ms Smith was able to start etanercept therapy. This anti-TNF agent is self-administered twice-weekly by subcutaneous injections. Within six weeks she had improved enormously, returning to part-time work after just six months.

She is assessed every three months in the outpatient clinic.

pivotal role in the management of patients with RA. Specialist nurses can provide high-quality care to those with very active disease, and have the knowledge and foresight to initiate new treatments or refer to other health professionals as appropriate. RA will always offer a major management challenge but with the advent of biological agents the profile of the disease is being raised. The new agents may provide greater efficacy and safety, and will help quell the fear of a future of disability and deformity confronting the newly diagnosed. ■