

Rheumatoid arthritis: When the body rebels against itself

There are over 200 kinds of rheumatic diseases, and 9 million people in the UK suffer from a form of arthritis (Arthritis Care, 2007a). Arthritis Care has a useful booklet, *Understanding Arthritis*, which covers the main clinical types of Arthritis; this is also available electronically from www.arthritiscare.org.uk/AboutArthritis.

The two main forms of arthritis are rheumatoid arthritis (RA) and osteoarthritis. Around 1% of the UK population have rheumatoid arthritis, making it more common than type 1 diabetes (Moots and Jones, 2004).

What is RA?

RA is a chronic progressive, often very painful, disease that causes inflammation of the lining of the joint capsules (synovium). The synovium is normally a thin and delicate covering that encapsulates a moving joint, lubricating and protecting the articular cartilage at the ends of the joints. In RA the synovium becomes thick and stiff with numerous infoldings on its surface, forming what is termed a 'pannus'.

When this protective synovium is damaged, the cartilage is eventually destroyed and the bone itself can be damaged. RA results in pain, swelling, redness, heat and loss of function (Moots and Jones, 2004). Any joint lined by synovium can be involved. The pain experienced can be very debilitating and resultant fatigue is common.

RA normally starts in the small joints of the hands and wrists, generally in a symmetrical pattern, for example, if the wrist is involved then the opposite wrist will be affected later. This eventually produces swollen, painful and mis-shapen joints, that gnarl and twist the fingers.

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This article on rheumatoid arthritis describes how it affects functional abilities and outlines different medical treatment options.

Next month's article will discuss how to help alleviate problem areas.

RA does not just affect the joints. Meszaros (2006) describes rheumatoid nodules (bumps under the skin) occurring around the joints and at the top of the arms and legs.

RA is termed a systemic disease, as it can also occur in other tissues. Moot and Jones describe the common extra-articular signs and symptoms of rheumatoid disease. The tendon sheaths (tubes in which the tendons move) can also become inflamed, as can the bursae (sacs of fluid that allow tendons and muscles to move smoothly over each other). Inflammation of the tendons and bursae can compress the nerves causing interference with nerve function and producing numbness or a tingling sensation. The meninges (that cover the brain and spinal cord) may be affected and vasculitis (inflammation of the blood vessels) may follow and may interfere with blood circulation or cause skin ulcers. If the covering of outside of the lungs and lining the chest cavity (pleura) is affected, this may cause shortness of breath.

Cause of RA

RA is thought to occur as a result of the failure of the body's auto immune system which for some reason turns on itself, attacking healthy tissue. The exact cause, or 'trigger', is unknown. However, 80% of adults with RA have what is termed the

'rheumatoid factor', HLA-DR4, a protein on the surface of leucocytes (white blood cells), which is rarely present in the normal population.

RA can affect any age range including children (termed juvenile RA), but is more frequent in the 30–50 year age group.

Predisposing factors

Several factors are thought to predispose a person to RA:

Genes and a genetic link

Several genes are thought to be responsible for the development of RA. The gene with the greatest contribution towards genetic susceptibility is the major histocompatibility complex (MHC) (Moots and Jones, 2004). Studies of identical twins have shown that the disease occurs in both twins in only 30% of cases (Moots and Jones, 2004), yet this is higher than the incidence in the general population.

Sex

Women are more commonly affected than men (3:1) and often have a remission during pregnancy (Moots and Jones, 2004). Females with a short reproductive life, with lower levels of reproductive hormones, are at greater risk of RA.

Environmental factors

The environment is thought to account for 70% of susceptibility to RA (Moots and Jones, 2004). This includes air pollution and heavy smoking.

Psychological stress and other medical illnesses

Life stress, obesity, a history of blood transfusions and a lower level of cortisol can increase the risk of RA. Bacterial infection can also trigger the disease in those who have risk factors.

RA appears therefore to be multi-factorial. Moots and Jones (2004) state that RA is:

'Likely to be a combination of inherited genes and environmental factors, possibly a virus'.

Reactive arthritis

Sometimes an inflammation in the joints develops quickly, usually 3–12 weeks after a triggering infection, in reaction to an infection or virus, such as the flu virus, food poisoning or sexually-transmitted diseases. Joint swelling and pain starts, generally in the knees, ankles or toes but this is treatable and attacks are usually short-lived. Initially, treatment with antibiotics will tackle the infection or virus that is thought to trigger the condition. Thereafter, treatment will be directed to controlling the symptoms.

Diagnosis

A diagnosis of RA is made when at least four of the following signs and symptoms are present:

- There is evidence of morning stiffness in the joints
- Arthritis is present in three or more joint areas
- Joint areas are simultaneously involved
- Rheumatoid nodules are present
- Abnormal amounts of serum rheumatoid factor are present and can be detected by a blood test. Blood tests can also reveal if there is anaemia that is a common symptom of RA as a result of a low red blood cell count, and also an elevated erythrocyte sedimentation rate (ESR) that correlates with inflammation
- Radiological changes of erosions or unequivocal bony decalcification localized or adjacent to the involved joint(s) are present.

Hand deformities

As the disease progresses, the inflammation persists and can result in joint deformities. Bony swellings appear (nodules) and the joint structure changes. In the upper limbs, ulnar drift (the fingers move away from the direction of the thumb at the knuckle) can occur.

Typical deformities that affect the hand are described in Merck Manuals (2003) www.merck.com/mmhe/sec05/ch071/ch071c.html. The two most common ones are:



WHAT IS RHEUMATOID ARTHRITIS? (ADAPTED FROM SYMMONS, 2002)

There is no single gene which is the cause of rheumatoid arthritis (RA). The same is true for the non-genetic factors. There is no single environmental factor, which is sufficient, by itself, to cause RA. We can think of RA as being like a plant. First, it needs the soil in which to grow. The soil is equivalent to the genetic factors. Then there are the seeds which have to be planted in the soil. The seeds are equivalent to the non-genetic risk factors. The richer the soil, i.e. the more genes associated with RA a person has, the fewer seeds are needed for a plant to grow. Thus, within families with several cases of RA, it is likely that there are many of the genes which are associated with RA, and so environmental risk factors play a smaller part in triggering the disease than in so-called 'sporadic' cases of RA.

Boutonnière deformity

This is also called a 'buttonhole' deformity. It occurs when the middle joint of the finger is bent in a fixed position towards the palm and the outermost finger joint is bent excessively outwards, away from the palm.

Swan neck deformity

A swan-neck deformity is a bending in (flexion) of the base of the finger, a straightening out (extension) of the middle joint, and a bending in (flexion) of the outermost joint.

Treatment

Although there is no cure for RA, medication can help reduce inflammation and symptoms. Arthritis Care (2007b) describes four broad clinical groups of drugs:

Painkillers (analgesics)

There are many types of painkillers that can

be prescribed. Some common examples include:

- Paracetamol
- Co-codamol
- Aspirin
- Diclofenac
- Ibuprofen
- Celecoxib.

Non-steroidal anti-inflammatory drugs (NSAIDs)

These reduce inflammation of the joint and pain. They can be given orally, by suppository or in a slow-release preparation. NSAID creams or gels are rubbed over a painful joint or muscle. NSAIDs can cause bleeding so they must be used with caution, and indigestion or stomach ulcers are contraindicated. The COX-2-specific NSAIDs have been linked with increased risks of heart attack and stroke.

Disease-modifying anti-rheumatic drugs (DMARDs)

This group of drugs reduces pain, swelling and stiffness but may take several weeks to work, e.g. gold, hydroxychloroquine, leflunomide, penicillamine and sulfasalazine. Another group of disease-modifying drugs are immunosuppressant drugs. They suppress the immune system, which is the body's defence system. They include azathioprine, ciclosporin, cyclophosphamide, methotrexate and mycophenolate. They may produce side effects and need careful monitoring.

A newer group of drugs are the 'biologicals'. These include adalimumab, etanercept, infliximab, anakinra and rituximab. These drugs can reduce joint inflammation and may be used to treat other inflammatory diseases. Currently, they are only used when there is no response to other disease-modifying drugs.

Corticosteroids (steroids)

Corticosteroids are very effective in controlling inflammation and may have some disease-modifying effects. However, longer-term use or high doses produce side effects. They can be injected into a vein, a muscle or into inflamed joints. Steroids can cause osteoporosis (thinning of the bones).

Side effects of medication

It is important for care staff to be aware of the side effects of drugs and to report these to senior staff and/or the GP. Side effects are common and include:

- Nausea
- Vomiting
- Diarrhoea
- Ulceration
- Hearing disturbances
- Vertigo
- Hypersensitivity.

Full details of side effects can be obtained from the chemist. Moot and Jones (2004) provide full details of the side effects of the main forms of medication prescribed for RA. Some side effects are short lived and it is therefore important to give drugs a trial period.

Some medication, such as azathioprine, ciclosporin, gold, leflunomide, methotrexate, penicillamine and sulfasalazine, can affect the blood and/or the working of

the liver or kidney. People on these drugs need to have their blood checked regularly. For gold and penicillamine, regular urine checks are needed. For ciclosporin and leflunomide, regular blood pressure checks are required (Arthritis Care, 2007b). It is vital that care staff are aware of the need for these regular checks and that this need is recorded in individual care plans.

Surgical treatment

Sometimes surgical treatment may be required, including:

- Arthroscopy – a needle is inserted into the joint space to inspect, diagnose and repair bone and cartilage fragments that cause pain and inflammation
- Synovectomy – removal of the inflamed joint lining
- Osteotomy – partial removal of damaged bone
- Arthroplasty – joint replacement.

Conclusion

RA can be a very painful medical condition and the exact cause remains unknown. Treatment is therefore aimed primarily at the reduction of pain and inflammation. As

with any other medical problem, often the medication can produce side effects and care staff need to be aware of these.

RA can cause joints to become deformed, which will decrease the range of movement and mobility. As a result, many people suffering from RA have problems with activities of daily living. Care staff can help sufferers of RA manage more easily and practical aspects are explored in the next article. **NRC**

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KEY POINTS

- **Of the UK population 1% suffers from a form of arthritis.**
- **Rheumatoid arthritis (RA) is a progressive painful condition whose exact cause is unknown.**
- **Medical treatment is aimed at relieving the symptoms of RA.**
- **Awareness of the side effects of medication is important.**