

# Ankylosing Spondylitis

## What is ankylosing spondylitis?

Ankylosing spondylitis is a form of chronic inflammation of the spine and the sacroiliac joints. The sacroiliac joints are located in the low back where the sacrum (the bone directly above the tailbone) meets the iliac bones (bones on either side of the upper buttocks). Chronic inflammation in these areas causes pain and stiffness in and around the spine. Over time, chronic spinal inflammation (spondylitis) can lead to a complete cementing together (fusion) of the vertebrae, a process referred to as ankylosis. Ankylosis leads to loss of mobility of the spine.

Ankylosing spondylitis is also a systemic disease, meaning it can affect other tissues throughout the body. Accordingly, it can cause inflammation in or injury to other joints away from the spine, as well as to other organs, such as the eyes, heart, lungs, and kidneys. Ankylosing spondylitis shares many features with several other arthritis conditions, such as psoriatic arthritis, reactive arthritis, and arthritis associated with Crohn's disease and ulcerative colitis. Each of these arthritic conditions can cause disease and inflammation in the spine, other joints, eyes, skin, mouth, and various organs. In view of their similarities and tendency to cause inflammation of the spine, these conditions are collectively referred to as "spondyloarthropathies." Ankylosing spondylitis is considered one of the many rheumatic diseases because it can cause symptoms involving muscles and joints.

Ankylosing spondylitis is two to three times more common in males than in females. In women, joints away from the spine are more frequently affected than in men. Ankylosing spondylitis affects all age groups, including children. The most common age of onset of symptoms is in the second and third decades of life.

## What causes ankylosing spondylitis?

This is the science bit but basically it is genetically inherited.

The tendency to develop ankylosing spondylitis is believed to be genetically inherited, and the majority (nearly 90%) of patients with ankylosing spondylitis are born with the HLA-B27 gene. Blood tests have been developed to detect the HLA-B27 gene marker and have furthered our understanding of the relationship between HLA-B27 and ankylosing spondylitis. The HLA-B27 gene appears only to increase the tendency of developing ankylosing spondylitis, while some additional factor(s), perhaps environmental, are necessary for the disease to appear or become expressed. For example, while 7% of the United States population have the HLA-B27 gene, only 1% of the population actually have the disease ankylosing spondylitis. In Northern Scandinavia (Lapland), 1.8% of the population have ankylosing spondylitis while 24% of the general population have the

HLA-B27 gene. Even among HLA-B27-positive individuals, the risk of developing ankylosing spondylitis appears to be further related to heredity. In HLA-B27-positive individuals who have relatives with the disease, their risk of developing ankylosing spondylitis is 12% (six times greater than for those whose relatives do not have ankylosing spondylitis).

Recently, two more genes have been identified that are associated with ankylosing spondylitis. These genes are called ARTS1 and IL23R. These genes seem to play a role in influencing immune function. It is anticipated that by understanding the effects of each of these known genes researchers will make significant progress in discovering a cure for ankylosing spondylitis.

## **What are the symptoms of ankylosing spondylitis?**

Ankylosing spondylitis affects different people in different ways. Symptoms develop gradually, may be mild or severe, and can come and go. They include:

- back pain and stiffness - this is worse at night and in the morning, and eases off when you move around
- pain and swelling of your hip, knee or other joints
- plantar fasciitis - pain under the heel of your foot
- aching in your chest, around your ribs
- feeling unwell or feverish and having night sweats
- weight loss
- tiredness

The symptoms of ankylosing spondylitis are related to inflammation of the spine, joints, and other organs. Fatigue is a common symptom associated with active inflammation. Inflammation of the spine causes pain and stiffness in the low back, upper buttock area, neck, and the remainder of the spine. The onset of pain and stiffness is usually gradual and progressively worsens over months. Occasionally, the onset is rapid and intense. The symptoms of pain and stiffness are often worse in the morning or after prolonged periods of inactivity. The pain and stiffness are often eased by motion, heat, and a warm shower in the morning. Because ankylosing spondylitis often affects adolescents, the onset of low back pain is sometimes incorrectly attributed to athletic injuries in younger patients.

Patients who have chronic, severe inflammation of the spine can develop a complete bony fusion of the spine (ankylosis). Once fused, the pain in the spine disappears, but the patient has a complete loss of spine mobility. These fused spines are particularly brittle and vulnerable to breakage (fracture) when involved in trauma, such as motor-vehicle accidents. A sudden onset of pain and mobility in the spinal area of these patients can indicate bone breakage. The lower neck (cervical spine) is the most common area for such fractures.

Chronic spondylitis and ankylosis cause forward curvature of the upper torso (thoracic spine), limiting breathing capacity. Spondylitis can also affect the areas where ribs attach

to the upper spine, further limiting lung capacity. Ankylosing spondylitis can cause inflammation and scarring of the lungs, causing coughing and shortness of breath, especially with exercise and infections. Therefore, breathing difficulty can be a serious complication of ankylosing spondylitis.

Patients with ankylosing spondylitis can also have arthritis in joints other than the spine. This feature occurs more commonly in women. Patients may notice pain, stiffness, heat, swelling, warmth, and/or redness in joints such as the hips, knees, and ankles. Occasionally, the small joints of the toes can become inflamed or "sausage" shaped. Inflammation can occur in the cartilage around the breast bone (costochondritis) as well as in the tendons where the muscles attach to the bone (tendinitis) and in ligament attachments to bone. Some patients with this disease develop Achilles tendinitis, causing pain and stiffness in the back of the heel, especially when pushing off with the foot while walking up stairs. Inflammation of the tissues of the bottom of the foot, plantar fasciitis, occurs more frequently in people with ankylosing spondylitis.

Other areas of the body affected by ankylosing spondylitis include the eyes, heart, and kidneys. Patients with ankylosing spondylitis can develop inflammation of the iris, called iritis. Iritis is characterized by redness and pain in the eye, especially when looking at bright lights. Recurrent attacks of iritis can affect either eye. In addition to the iris, the ciliary body and choroid of the eye can become inflamed; this is referred to as uveitis. Iritis and uveitis can be serious complications of ankylosing spondylitis that can damage the eye and impair vision and may require an eye specialist's (ophthalmologist) urgent care. Special treatments for serious eye inflammation are discussed in the treatment section below. (It should be noted that iritis and inflammation of the spine can occur in other forms of arthritis such as reactive arthritis [formerly Reiter's syndrome], psoriatic arthritis, and the arthritis of inflammatory bowel disease.)

A rare complication of ankylosing spondylitis involves scarring of the heart's electrical system, causing an abnormally slow heart rate. A heart pacemaker may be necessary in these patients to maintain adequate heart rate and output. The part of the aorta closest to the heart can become inflamed, resulting in leakage of the aortic valve. In this case, patients can develop shortness of breath, dizziness, and heart failure.

Advanced spondylitis can lead to deposits of protein material called amyloid into the kidneys and result in kidney failure. Progressive kidney disease can lead to chronic fatigue and nausea and can require removal of accumulated blood poisons by a filtering machine (dialysis).

## **What are treatment options for ankylosing spondylitis?**

### **Painkillers and anti-inflammatories**

Your GP or rheumatologist will usually advise you to try non-steroidal anti-inflammatory drugs (NSAIDs) first, to help with your pain. NSAIDs will reduce inflammation and pain so that you can keep active. You can buy some NSAIDs, such as ibuprofen (eg Nurofen), from your pharmacist. Other NSAIDs, such as celecoxib, have to be prescribed by your GP.

These medicines can have side-effects such as stomach pain or bleeding from the stomach. Talk to your GP or pharmacist if you need to take NSAIDs regularly, and see your GP immediately if you experience any pain that feels like indigestion while taking NSAIDs. Always read the patient information leaflet that comes with your medicine.

If you can't take NSAIDs for any reason, your doctor may advise you to take another painkiller, such as paracetamol, instead. Or, he or she may prescribe a medicine called a proton pump inhibitor to take at the same time as an NSAID, to reduce your risk of side-effects.

Your doctor can also prescribe corticosteroid injections, which he or she will inject into joints (such as your knee) if they are very painful and swollen.

### **Disease-modifying anti-rheumatic drugs (DMARDs)**

Depending on how severe your disease is, your rheumatologist may also prescribe disease-modifying anti-rheumatic drugs (DMARDs) such as methotrexate or sulfasalazine. These medicines are used for other types of arthritis that are due to inflammation (eg rheumatoid arthritis). They work by changing the actual disease process of ankylosing spondylitis. It may take some time before you notice any effect.

### **TNF-a inhibitors**

If DMARDs have not helped relieve your symptoms, your rheumatologist may recommend a type of medicine called a TNF-a inhibitor. Two of these medicines (etanercept and adalimumab) are available on the NHS for people with ankylosing spondylitis. They are given by injection.

### **Bisphosphonates**

Bisphosphonates (eg, pamidronate) affect bone metabolism and are usually used to prevent or treat osteoporosis (thin bones). However, they are also sometimes used in the treatment of ankylosing spondylitis. They are also given by injection. Your rheumatologist may prescribe these if he or she thinks these medicines will help you.

### **Physical Therapy**

Physical therapy for ankylosing spondylitis includes instructions and exercises to maintain proper posture. This includes deep breathing for lung expansion and stretching exercises to improve spine and joint mobility. Since ankylosis of the spine tends to cause forward curvature, patients are instructed to maintain erect posture as much as possible and to perform back-extension exercises. Patients are also advised to sleep on a firm mattress and avoid the use of a pillow in order to prevent spine curvature. Ankylosing spondylitis can

involve the areas where the ribs attach to the upper spine as well as the vertebral joints, thus limiting breathing capacity. Patients are instructed to maximally expand their chest frequently throughout each day to minimize this limitation.

Exercise programs are customized for the individual patient. Swimming is preferred, as it avoids jarring impact of the spine. Ankylosing spondylitis need not limit a patient's involvement in athletics. Patients can participate in carefully chosen aerobic sports when their disease is inactive. Aerobic exercise is generally encouraged as it promotes full expansion of the breathing muscles and opens the airways of the lungs.

Inflammation and diseases in other organs are treated separately. For example, inflammation of the iris of the eyes (iritis or uveitis) may require cortisone eyedrops (Pred Forte) and high doses of cortisone by mouth. Additionally, atropine eyedrops are often given to relax the muscles of the iris. Sometimes injections of cortisone into the affected eye are necessary when the inflammation is severe. Heart disease in patients with ankylosing spondylitis may require a pacemaker placement or medications for congestive heart failure.

Cigarette smoking is strongly discouraged in patients with ankylosing spondylitis, as it can accelerate lung scarring and seriously aggravate breathing difficulties. Occasionally, patients with severe lung disease related to ankylosing spondylitis may require oxygen supplementation and medications to improve breathing.

Patients may need to modify their activities of daily living and adjust features of the workplace. For example, workers can adjust chairs and desks for proper postures. Drivers can use wide rearview mirrors and prism glasses to compensate for the limited motion in the spine.

### **Heat/Cold**

Applying heat to stiff joints and tight muscles can help reduce pain and soreness. Applying cold to inflamed areas can help reduce swelling. Hot baths and showers can also help provide relief.



### **Surgery**

In severe cases of AS, surgery can be an option in the form of joint replacements, particularly in the knees and hips. Surgical correction is also possible for those with severe flexion deformities (severe downward curvature) of the spine, particularly in the neck, although this procedure is considered risky. [Click here](#) to learn more about surgery in our Patient Resources section.

### **Other Symptom Management Tools**

Alternative treatments such as massage and using a TNS unit (electrical stimulators for pain) can also aide in pain relief. Maintaining a healthy body weight and balanced diet can also aide in treatment.

## **What is in the future for patients with ankylosing spondylitis?**

Ankylosing spondylitis and each of the spondyloarthropathies are areas of active research. The relationship between infectious agents and the triggering of chronic inflammation is vigorously being pursued. Factors that perpetuate "autoimmunity" are being identified. The characteristics of the gene marker HLA-B27 are being further defined. In fact, there are now known to be seven different subtypes of HLA-B27.

The impact of the recent discovery of the two additional genes associated with ankylosing spondylitis (described above under "Causes") cannot be overstated. As more about the precise mechanisms these genes use to influence the immune system is understood, the discovery of a cure will be possible. Moreover, results of ongoing research will lead to a better understanding and treatment of the entire group of diseases collectively known as spondyloarthropathies.

## **Ankylosing Spondylitis At A Glance**

- Ankylosing spondylitis belongs to a group of arthritis conditions which tend to cause chronic inflammation of the spine (spondyloarthropathies).
- Ankylosing spondylitis affects males two to three times more commonly than females.
- Ankylosing spondylitis is a cause of back pain in adolescents and young adults.
- The tendency to develop ankylosing spondylitis is genetically inherited.
- The HLA-B27 gene can be detected in the blood of most patients with ankylosing spondylitis.
- Ankylosing spondylitis can also affect the eyes, heart, lungs, and occasionally the kidneys.
- The optimal treatment of ankylosing spondylitis involves medications that reduce inflammation or suppress immunity, physical therapy, and exercise.