THE term ‘spondyloarthritis’ encompasses a group of related conditions with common clinical features and an increased frequency of HLA-B27. The shared clinical features include axial skeleton involvement (sacroiliac joints and spine), peripheral joint involvement that is commonly asymmetrical, oligoarticular, large joint, as well as enthesitis, tenosynovitis and extra-articular features, including uveitis.

Etymologically, the term spondyloarthritis is an amalgamation of spondylo and peripheral arthritis (joint inflammation) to signify the association of peripheral and axial involvement in these conditions.

The group includes ankylosing spondylitis, psoriatic arthropathy, reactive arthropathy, spondyloarthritis associated with inflammatory bowel disease, undifferentiated spondyloarthritis and non-radiographic spondyloarthropathy.

The term ankylosing spondylitis is derived from the Greek words ankylosis (bent or crooked) and spondylos (vertebra). This disease appears in specimens from antiquity emphasizing its ancient origins.

In the past 10 years, new treatment for ankylosing spondylitis has dramatically altered the outcome for this group of patients. Early diagnosis is important to reduce the immense symptomatic burden and loss of function during the productive years of these patients’ lives.

Classification of spondyloarthritis

The term spondyloarthritis includes a spectrum of disorders with similar features and an increased frequency of HLA-B27 (see figure 1). Axial involvement leads to inflammatory lower back pain with marked morning spinal stiffness and worsening of symptoms with inactivity. Common clinical features in peripheral joints include large joint involvement, oligoarthritis and monoarthritis, tenosynovitis manifesting as dactylitis, and enthesitis. Extra-articular features associated with this group of disorders include uveitis and, rarely, aortic regurgitation and upper lobe pulmonary fibrosis.

Some diseases within this group exhibit predominantly axial skeletal involvement with peripheral arthritis (chiefly large joint) occurring in a proportion of sufferers. This group is termed the axial spondyloarthropathy group and includes ankylosing spondylitis. Ankylosing spondylitis is the best example of this end of the spectrum – primarily axial involvement with peripheral arthritis occurring in the hips and shoulders.
How to Treat – Ankylosing spondylitis/spondyloarthritis

The peripheral spondyloarthropathy group of conditions within the spectrum exhibit primarily peripheral joint symptoms with axial involvement seen less frequently.

Psoriatic arthritis, reactive arthritis, and IBD associated spondyloarthritis commonly manifest with predominantly peripheral symptoms with axial symptoms less frequent.

Undifferentiated spondyloarthritis is a term applied to subjects who have some features of spondyloarthropathy but do not merit diagnostic criteria for ankylosing spondylitis, psoriatic arthropathy, or reactive arthropathy spondyloarthritides associated with inflammatory bowel disease.

These patients may remain undifferentiated or may differentiate over time to fit more clearly into one of the other categories.

Non-radiographic spondyloarthropathy is a relatively recent term. This group of patients have features consistent with axial spondyloarthropathy with primarily axial involvement. The defining feature of this group is that X-ray changes of sacroiliitis are absent, but the patient may have characteristic clinical features of spondyloarthropathy or MRI features consistent with sacroiliitis or spinal inflammatory disease. The natural history of this group is uncertain.

Whether patients with this condition progress to ankylosing spondylitis, spontaneously resolve or experience remission of symptoms with therapy remains unknown. It is a group that is being closely examined in clinical trials, particularly to determine whether treatment is effective.

Natural history in the axial spondyloarthropathy group

There is considerable ongoing debate as to the natural history of conditions encompassed within the axial spondyloarthropathy group. While traditional ankylosing spondylitis patients generally have severe progressive disease, there is uncertainty regarding the progression of patients with milder forms of the disease, and patients with non-radiographic forms.

The natural history pathways of patients with axial spondyloarthropathy is summarised in figure 2.

New criteria to assist in diagnosis: the ASAS criteria

Prior to 2000, treatment options were limited, and the need for early diagnosis to facilitate treatment was less critical. The emergence of effective therapy in the form of anti-TNF agents and interleukin inhibitors, coupled with strong evidence that early therapy leads to marked clinical improvement, means that it is essential that efforts are made to identify these patients early.

The Assessment of SpondyloArthritis international Society (ASAS) criteria were developed in recognition of the difficulty in identifying these patients. The criteria recognise the emerging use of MRI in diagnosis and attempt to include other common features such as enthesis in the diagnostic method.

The sensitivity of the criteria is 81% with specificity 84%. Of course, no set of criteria are perfect and the ASAS criteria continues to undergo modification as our understanding of the disease progresses.

The criteria exist to assist rheumatologists in identifying patients with spondyloarthropathy and thereby identifying those patients who would benefit from treatment.

Criteria to assist GPs, based upon the ASAS criteria, are outlined in figure 3.

This How to Treat will focus primarily on ankylosing spondylitis as the prototypic disease within the axial spondyloarthropathy group. Recommendations regarding early diagnosis of inflammatory back pain later in this article relate to all forms of axial spondyloarthropathy.

Environmental factors associated with greater severity of disease are cigarette smoking, lower socioeconomic status and educational level.

Epidemiology

THE prevalence of ankylosing spondylitis in patients of European descent is approximately 0.5-1%, with the condition occurring at similar rates in Asian populations. It is rare in African populations and in Indigenous Australians. Males are more affected than females (3:1) with the typical age of onset in the late teens and early 20s. Diagnosis is often delayed because of the fluctuating nature of symptoms. The average delay from onset of symptoms to diagnosis is 8-11 years.

Aetiology and pathogenesis

ANKYLOSING spondylitis occurs with higher frequency within families. The cause remains unknown, however, it is widely recognised that HLA-B27 is the major gene associated with the condition. HLA-B27 occurs in 90% of patients with ankylosing spondylitis and may have a direct epitopathogenic role via interleukin 23 (IL-23) signalling.

The exact triggers in individuals remain undetermined, but putative mechanisms include alterations in the gut microbiome and mechanical entheseal stress. Environmental factors associated with greater severity of disease are cigarette smoking, lower socioeconomic status and educational level.

Environmental factors associated with greater severity of disease are cigarette smoking, lower socioeconomic status and educational level.
How to Treat – Ankylosing spondylitis/spondyloarthritis

Pathophysiology

THE enthesis is the region at the junction between tendon and bone. This has been suggested as the key target in spondyloarthritis. The area contains a unique type of T-cell, which, when activated by IL-23, can produce the characteristic changes seen in ankylosing spondylitis.

Enthesitis occurs in the axial skeleton (spondylitis and sacroiliitis) and surrounding peripheral joints (enthesitis and tendinitis). The proposed sequence of events is enthesitis and osteitis with ossification occurring as part of the unbridled pathogenic process. Ultimately, if the process is not arrested by effective treatment, ossification of entheseal attachments and ultimately, ankylosis, will occur (see figure 4).

Clinical features

CONSIDER ankylosing spondylitis in any patient who presents with chronic back pain (longer than three months), with symptoms starting before the age of 45. Chronicity is relevant because acute back pain is so common in primary care.

The features of back pain that signal an inflammatory cause are age at onset less than 40-45, insidious onset, pain at night (with improvement on getting up), improvement with exercise and no improvement with rest (see figure 2). It is important to differentiate inflammation from mechanical back pain, as outlined in figure 3. Please see the full resource online for further details.

Extra-articular features

Extra-articular features are increasingly rare with modern treatment, with the exception of uveitis, recurrent in a small proportion of patients. The most commonly reported features are anterior uveitis (30-40%), aortic regurgitation because of aortic valve root dilatation, upper lobe pulmonary fibrosis, IgA nephropathy and amyloidosis.

Anterior uveitis (preponderantly unilateral) usually becomes less frequent with TNF inhibition. Notably, among the TNF inhibitors, infliximab (Remicade) and adalimumab (Humira) appear to provide the best likelihood of reducing the frequency of episodes of uveitis in patients with ankylosing spondylitis.

Diagnostic investigations

Genetic testing

HLA-B27 still has a role in assessment of patients with suspected ankylosing spondylitis. More than 90% of patients with HLA-B27 positive compared with 8% of the general population.

It is well recognised that HLA-B27 forms part of the diagnostic process and is not a diagnostic test that can stand alone. However, the presence of HLA-B27 raises the likelihood of ankylosing spondylitis in a patient with a compelling history.

Imaging

Plain radiographs

Plain radiographs of the pelvis (sacroiliac joints) are useful in patients with suspected ankylosing spondylitis; however, it is very important that the limitations of plain films are appreciated. Radiographic changes can take years to develop, with some estimates indicating that radiographic sacroiliitis may not be evident for up to 10 years after symptoms have developed.

It must also be recognised that

Assessment

Having made the decision to pursue a diagnosis of AS in a patient, diagnosis will involve a combination of genetic testing, ESR and CRP, radiographs, MRI and referral to a rheumatologist. Clinical tests of spinal function such as Schober’s test (to flex the lower back) have low sensitivity and are not an adequate replacement for diagnostic imaging.

Table 1. Investigations

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLA-B27</td>
<td>Assists in establishing diagnosis, increases likelihood.</td>
</tr>
<tr>
<td>Plain AP pelvis radiograph</td>
<td>Helpful if positive. A negative radiograph does not rule out the diagnosis.</td>
</tr>
<tr>
<td>MRI SI joints T1 and T2</td>
<td>Sensitive in detecting osteitis (T2) and erosions, sclerosis (T1).</td>
</tr>
<tr>
<td>MRI lumbar spine</td>
<td>Rule out alternative diagnoses. Establish baseline disease activity, predicts severe disease.</td>
</tr>
<tr>
<td>ESR, CRP</td>
<td></td>
</tr>
</tbody>
</table>
How to Treat – Ankylosing spondylitis/spondyloarthritis

from page 24

plain radiograph sacroiliac joint changes can be subtle and underreported if the reporting radiologist is not familiar with the grading system used for documenting sacroiliac joint changes. The important point overall is that a negative radiograph does not rule out the diagnosis.

For diagnostic purposes, a plain AP pelvic X-ray is optimal. There is no benefit in obtaining radiographs of the rest of the spine unless an alternative diagnosis is being excluded or assessment of damage in long-term ankylosing spondylitis is being assessed.

MRI

Increased access to MRI has transformed the early diagnosis of ankylosing spondylitis. MRI can assess active inflammation of the sacroiliac joints and spine.

The most important lesion in the sacroiliac joints is osteitis (formerly bone marrow oedema), a lesion best appreciated on T2 weighted images using a fat suppression sequence (usually short TI inversion recovery).

Ligament and tendon attachment sites are frequently involved and can be identified on the T2 weight sequence. Synovitis within the sacroiliac joint is visible on post-gadolinium T1 weight images, but is not essential for diagnosis and gadolinium is not required routinely.

Sclerosis, erosions and fat metaplasia are chronic lesions best appreciated on T1-weighted images. These lesions represent damage (erosions), and chronicity (sclerosis and fat metaplasia) (see figure 6).

Spinal MRI is less sensitive than sacroiliac MRI imaging. The predominant abnormalities are corner lesions (hyperintense on T2 weighted imaging) corresponding to the Romanus lesions identified on radiographs in long-term disease. Spondylodiscitis lesions (hyperintensity on T2 imaging) correspond to radiographic Anderson lesions in chronic disease.

For practical purposes, MRI imaging should include sacroiliac joints using T1 and T2 weighted imaging. Gadolinium is not required for routine sacroiliac joint imaging.

The lumbar spine is included to rule out other possible entities that could mimic sacroiliac pathology. Imaging of the thoracic and cervical region is undertaken if there are specific symptoms in these regions, but not as a routine.

CT and nuclear medicine

Both CT and nuclear scintigraphy have a very limited role in the diagnosis of ankylosing spondylitis and axial spondyloarthritis. The sensitivity and specificity of both techniques is inferior to MRI. Both CT and bone scan may be useful when other causes of back pain are suspected.

Assessing disease activity

Measurement of ESR and CRP is useful in assessing disease activity and forms part of the baseline assessment once the diagnosis of AS has been established. The Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) (figure 8) is a tool used by rheumatologists to assist in assessing clinical activity and forms part of the application for access to TNF inhibitors.

How to score a BASDAI

The BASDAI consists of a one to 10 scale (one being no problem and 10 being the worst problem) relating to the five major symptoms of ankylosing spondylitis. These individual scores for questions one to five are added, then divided by five. A score of four or greater suggests disease control is not optimal, and these patients may require a change in medication.

Figure 6. Sacroiliac joint abnormalities in ankylosing spondylitis. A. Normal sacroiliac joint. B. Coronal oblique fat-suppressed T2-weighted images of the sacroiliac joint in a 32-year-old man with ankylosing spondylitis shows bilateral peritransverse bone marrow oedema (arrow). C. Bone marrow oedema and synovitis in a 32-year-old man with ankylosing spondylitis. Coronal oblique fat-suppressed T2-weighted MR image show bilateral hyperintense sacral and iliac areas consistent with synovitis.


Figure 8. The Bath Ankylosing Spondylitis Disease Activity Index (BASDAI).
Management

Education and exercise

PATIENT education and support are vital in the management of ankylosing spondylitis. Having a diagnosis is an important first step for patients, providing them with an explanation for symptoms that may have been present for many years. Education should include an explanation of the importance of exercise and activity in maintaining spinal mobility.

NSAIDs

NSAIDs are first-line therapy for symptomatic patients with ankylosing spondylitis, but it must be emphasised that NSAIDs act to relieve symptoms. While there is evidence that NSAIDs may reduce osteo-proliferation, the use of long-term NSAIDs must be individualised. If diagnosed early, a large proportion of patients who commence specific TNF inhibition for ankylosing spondylitis will not require additional analgesics. The role of long-term NSAIDs in this group, other than for symptom relief, is questionable.

Conventional synthetic DMARDs

Many patients with ankylosing spondylitis have no role in the management of axial symptoms. Both agents may be useful in patients with resistant peripheral arthritis.

Tumour necrosis factor inhibitors

Onset before 45 years of age should be referred to the rheumatologist if at least one of the following parameters is present:

- Inflammatory back pain
- HLA-B27 positivity
- Bacterial infections on imaging, if available (on X-rays or MRI)
- Peripheral manifestations (in particular arthritis, enthesitis and/or dactylitis)
- Extra-articular manifestations (psoriasis, inflammatory bowel disease and/or uveitis)
- Positive family history for spondylarthritides
- Good response to non-steroidal anti-inflammatory drugs
- Elevated acute phase reactants

In any set of criteria, preferably ASAS definition of inflammatory back pain: at least four out of five parameters present: (1) age onset <45 years; (2) positive HLA-B27; (3) improvement with exercise; (4) no improvement with rest; and (5) pain at night (with improvement upon getting up).

Only if imaging available, not recommended as a routine screening parameter.

According to the definition applied in the classification criteria for axial spondyloarthritis:

- Axial arthritis: past or present synovitis diagnosed by a physician.
- Enthesitis (heel): past or present symptomatic pain at tenderness at examination of the enthesis in a positive test for the Achilles less than or equal to three times in dose frequency, mode of administration, administration, half-life, and effect on extra-articular features. The mode of administration of each agent is summarised in table 2.

Adverse effects associated with TNF inhibitors are uncommon, but well documented. It must be emphasised that the benefits to patients who respond to treatment are immense and the risks of therapy must be put into this context. The most common adverse effects are injection site reaction (SC agents), which manifests as an erythematous area at the site of injection. The area is generally pruritic and raised, and may persist for 48-72 hours. The reaction can be managed with conventional antihistamines and topical corticosteroids. Most local reactions will subside with ongoing therapy. However, if reactions remain troublesome, a switch to an alternate anti-TNF is recommended.

Community acquired infections do not occur with increased frequency in patients treated with TNF inhibitors, but if infections occur, usual treatment is reasonable. Often patients will not develop the usual early signals of infection (for example, dysuria and fever with UTI), but will complain of lasts or specific symptoms. If bacterial infections occur, it is reasonable to continue the anti-TNF agent until the patient has recovered and consider a more prolonged course of antibiotics if recovery is slow. All patients are screened prior to administration of anti-TNF (etanercept, infliximab, adalimumab) or methotrexate. The risk of reactivation of TB in particular is a concern in patients with previous exposure and latent disease. Any such patient, if commenced on methotrexate, is treated with isoniazid before beginning anti-TNF therapy. Drug-induced lupus and demyelination are now rare complications of TNF inhibitors. A lupus reaction to TNF inhibitors usually presents in a patient who has been stable for some time, but develops increasing fatigue, joint pain, low-grade fever and occasionally a skin rash or purpura. Denyelisation most commonly manifests in optic neuritis and is a very rare complication.

Assessment and monitoring

The objective of treatment is to achieve a state of minimal or no axial and peripheral joint symptoms, stable measures of spinal mobility, and optimal functional status. The rheumatologist usually assesses patients at six-monthly intervals when treatment has been stable and the patient deemed in remission.

Case studies

Case study one

STEPHEN was 18 when his back pain became severe and constant. He was sitting his year 12 examinations, and remembered he was constantly warm in the background. He was plagued by pain at night, generally waking up at 2-3 am and getting up to walk around to relieve the stiffness in his lower back. When he woke in the morning, he found that he had to get out of bed because of the pain.

He was prescribed NSAIDs with relief initially, but he soon found that nothing helped his symptoms. After completing his HSC, his symptoms worsened. He was unable to continue his part-time job, found it difficult to study and even drew from his friends. He stopped exercising and playing sport, and postponed his enrolment to university, fearing that he would not be able to complete his studies.

He had developed significant depression requiring psychological intervention and treatment with SSRIs. Despite these measures, his depression remained overwhelming.

He had similar symptoms when he was 15. He had seen his GP, and blood tests and X-rays had been performed. The X-ray had shown a possible pars interarticularis defect, but this was not conclusive. An MRI of the lumbar spine had been normal.

He spent a lot of time in physiotherapy, and his symptoms had increased and worsened. He thought he had exercised regularly, that he could manage.

The symptoms seemed to be improving by the time he turned 16, and given the all-clear, he had returned to sport. He reported that during this time his pain never really completely disappeared, but with intermittent NSAIDs, physiotherapy support and regular massage, he was able to put his symptoms in the background. He thought that he would just have to live with some back pain.

Increasing pain, despite multiple courses of NSAIDs, led to a further visit to his GP. The GP recognised the pain was severe and that the presentation was unusual for a similar group. He was referred to a rheumatologist for assessment.

At the rheumatology review, it was noted that he had no significant family history, no history of psoriasis, no history of uveitis, and no history of other spondyloarthritides. He was troubled by recurrent bilateral Achilles tendinosis for two years, which was managed by self-referral to a physiotherapist. Range of motion of the lumbar spine was severely restricted.

Genetic testing confirmed HLA-B27 positive, and his symptoms improved. He was started on a TNF-inhibitor. Within three months, his back pain and stiffness had resolved completely. The Achilles tendinosis ceased to be an ongoing issue. He began to sleep well at night and his fatigue resolved. Within four months, he had returned to full-time employment, and all NSAIDs and required no analgesia.

He returned to sport, resumed a part-time job, and undertook a course of diagnosis, he was able to begin his university studies. With the pain resolved, his depression became manageable without medication.

Nine years later, Stephen attends a follow-up meeting for ankylosing spondylitis.
How to Treat – Ankylosing spondylitis/spondyloarthritis

from previous page

the rheumatology practice every six months for assessment. However, her symptoms continued to remain well, with no adverse effects from therapy and has an ongoing excellent response.

Important points:

Inflammatory lower back pain can be insidious in onset. The important factors in this patient are the prolonged history, and the symptoms strongly suggestive of inflammatory pain. The investigations provide excellent supportive evidence for ankylosing spondylitis.

Case study two

Rebecca reported lower back pain and fatigue as her primary symptoms. At 28, she had put most of the year-long fatigue down to a busy social and work schedule. She had been in studies and thyroid studies performed, and when no obvious cause was found she decided she would have to get on with it and stop complaining, or modify her lifestyle.

It had occurred to her that her back pain could be related. She had experienced lower back pain ever since she was a child and had a long history of back pain while backpacking in South-East Asia in her late teens. It was a long

trip and the road was very rough. She felt stiff and sore after she got off the bus. The pain was severe for 48 hours, but gradually resolved over two weeks, and Rebecca related all of her back pain since then to that bus ride.

Eventually the episodes occurred randomly with no clear precipitant. Each episode would last up to two months, during which she would take up to see over-the-counter ibuprofen per day to control her pain. She had two sets of lumbar spine radiographs performed over the years. These had been normal and she had learned to manage her episodes of pain as they occurred, seeking physiotherapy assistance if the pain was severe.

Further questioning revealed a family history of psoriatic arthritis. Her father had been affected and required treatment with methotrexate. She had no psoriasis on her history of examination, but abdominal symptoms had been problematic over a number of years.

She described lower abdominal cramping and frequency of bowel motions that usually accompanied her episodes of lower back pain. She had put this down to the anti-inflammatory medications that she had been taking during that period, and did not mention it to her GP. There had been no episodes of dacryocystitis or recurrent tendinitis.

There were no urinary symptoms.

In the past six months, her episodes of back pain had become constant. Rebecca described severe morning stiffness and felt too exhausted to exercise. Her sleep pattern was poor, constantly interrupted by pain. The abdominal symptoms had become more intrusive. The previous plain radiographs were reviewed and there was no abnormality in the lumbar spine.

During initial investigations, she was referred to a gastroenterologist for investigation of the abdominal symptoms. An endoscopy and colonscopy with terminal ileal biopsy was normal.

Further investigations excluded an infective cause for the abdominal symptoms and urine examination was normal. HLA-B27 was not detected, ESR 25, CRP 16. MRI confirmed osteitis of sacroiliac joints bilaterally, with small erosions noted on T1 weighted imaging. Plain radiographs of the sacroiliac joints confirmed bilateral Grade 1 sacroilitis.

After screening investigations, Rebecca was started on a TNF inhibitor within a clinical trial. Marked improvement was noted within six weeks, with eventual resolution of pain. Her fatigue improved markedly and the abdominal symptoms resolved.

After five years, she continues treatment with an ongoing excellent response. Attempts to withdraw treatment on two occasions have resulted in disease flare.

How to treat Ankylosing spondylitis/spondyloarthritis

How to Treat Quiz

Ankylosing spondylitis/spondyloarthritis — 22 July 2016

1. Which THREE are common features of spondyloarthritis?
   a) Axial skeletal involvement
   b) Psoriatic arthritis
   c) Inflammatory enthesopathy
   d) Extra-articular features, such as uveitis

2. Which TWO statements regarding the nature of the arthropathies are correct?
   a) Ankylosing spondylitis manifests with primarily peripheral involvement, with peripheral arthritis occurring in the hips and shoulders.
   b) Psoriatic arthritis manifests with primarily axial involvement, with peripheral arthritis occurring in the hips and shoulders.
   c) Reactive arthritis commonly manifests with predominantly peripheral symptoms, with axial symptoms less common.
   d) Non-radiographic spondyloarthropathy has features of sacroiliitis on X-ray but no MRI features consistent with sacroilitis or spinal inflammatory disease.

3. Which THREE statements regarding the epidemiology of ankylosing spondylitis are correct?
   a) The prevalence of ankylosing spondylitis is the same in those of European and African descent.
   b) The prevalence of ankylosing spondylitis is the same in those of European and Asian descent.
   c) Males are more affected than females.
   d) The average delay from onset of symptoms to diagnosis is 8-11 years.

4. Which TWO statements regarding the aetiology of ankylosing spondylitis are correct?
   a) The cause of ankylosing spondylitis is well described, and the condition occurs with higher frequency within families.
   b) HLA-B27 occurs in 90% of patients with ankylosing spondylitis and may have a direct etiopathogenic role via interleukin 23 (IL-23) signaling.
   c) Environmental factors associated with greater severity of disease are living under/above ground level and exposure to lead.
   d) The exact triggers for ankylosing spondylitis in individuals remain undetermined, but putative mechanisms include alterations in the gut microbiome and mechanical arthralgic stress.

5. Which THREE features increase the suspicion of ankylosing spondylitis?
   a) Family history of ankylosing spondylitis
   b) Other features of spondyloarthritis
   c) Dramatic response to NSAIDs
   d) Older than 45

6. Which TWO statements regarding the investigation and diagnosis of ankylosing spondylitis are correct?
   a) Diagnosis is made on clinical examination (inability to flex the lumbar spine), supported by the history of back pain for longer than three months.
   b) A positive HLA-B27, in conjunction with a history of lower back pain, is sufficient to confirm the diagnosis of ankylosing spondylitis.
   c) A negative radiograph does not rule out the diagnosis of ankylosing spondylitis.
   d) For diagnostic purposes, a plan anteroposterior pelvic X-ray is optimal.

7. Which THREE statements regarding the investigation and diagnosis of ankylosing spondylitis are correct?
   a) CT and bone scan provide useful information about grading the severity of ankylosing spondylitis.
   b) MRI will assess active inflammation of the sacroiliac joints and spine.
   c) Measurement of ESR and CRP is useful in assessing disease activity and forms part of the baseline assessment once the diagnosis of ankylosing spondylitis has been established.
   d) The Bath Ankylosing Spondylitis Disease Activity Index is a tool used by rheumatologists to assist in assessing clinical activity.

8. Which TWO statements regarding the management of ankylosing spondylitis are correct?
   a) Anti-TNF therapy results in dramatic response, with reduction and resolution of multiple symptoms.
   b) Adverse effects associated with TNF inhibitors are common.
   c) There are currently five anti-TNF therapies licensed for use in Australia for the treatment of ankylosing spondylitis.
   d) The most common adverse effect is injection site reaction for subcutaneous agents, which manifests as an erythematous area at the site of injection.

9. Which THREE statements regarding the management of ankylosing spondylitis are correct?
   a) Anti-TNF therapy results in dramatic response, with reduction and resolution of multiple symptoms.
   b) Adverse effects associated with TNF inhibitors are common.
   c) There are currently five anti-TNF therapies licensed for use in Australia for the treatment of ankylosing spondylitis.
   d) The most common adverse effect is injection site reaction for subcutaneous agents, which manifests as an erythematous area at the site of injection.

10. Which TWO statements are correct?
    a) The objective of treatment is to achieve a state of minimal or no axial and peripheral joint symptoms, stable measures of spinal mobility and optimal functional status.
    b) Once patients with ankylosing spondylitis have been symptom-free for six months, medication with draw can be considered.

For further reading:

References and further reading available on request from howtotreat@cirrusmedia.com.au