Chapter 19

Ankylosing spondylitis and the seronegative spondyloarthopathies

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KEy POINTS

- There are a group of disorders collectively known as the spondyloarthopathies: ankylosing spondylitis, psoriatic arthritis, reactive arthritis and Reiter’s disease, and enteropathic arthritis
- Clinical features of the spondyloarthopathies can overlap and can include low back pain and stiffness, restriction of chest expansion, inflammation of the sacroiliac joints, enthesitis, peripheral joint involvement and extraarticular manifestations (e.g. inflammation in the eye)
- Ankylosing spondylitis is considered the prototype of the spondyloarthopathies
- Treatment includes both pharmacological and nonpharmacological interventions
- Physical activity and exercise form key components of treatment and self management approaches.

INTRODUCTION

This chapter will describe the group of disorders collectively known as the spondyloarthopathies a group of interrelated but heterogenous conditions (Boonen et al 2004). The treatment of these conditions will be considered using ankylosing spondylitis (AS) as the exemplar. A number of different terms have been used to describe the same group of conditions including spondarthritides (Moll 1987), spondylarthropathies (Hakim & Clunie 2002), seronegative spondyloarthritides (Olivieri et al 2002) and spondyloarthopathies (Wordsworth 2002). The last term has been adopted for use in this chapter. The chapter will cover ankylosing spondylitis, psoriatic arthritis, reactive arthritis and Reiter’s disease, and enteropathic arthritis.

There is a degree of disagreement over the grouping and classification of the conditions within the group collectively known as the spondyloarthopathies (SpA) (Nash et al 2005). It was once thought that different entities of the SpA group represent variable expressions of the major characteristics of the same disease. Patients with SpA commonly test negative for rheumatoid factor hence the term ‘seronegative’. In addition there is a common but
variable association with the genetic factor HLA-B27, although some evidence suggests that there are also close associations with other HLA gene factors in this group (Said-Nahal et al 2002). There are racial variations in HLA B27 distribution with corresponding variations in the prevalence of SpA within the same racial grouping. Box 19.1 lists the common features associated with the SpA group of conditions.

**BOX 19.1  Features of the spondyloarthopathies (after Nash et al 2005)**

- Axial skeletal disease
- Peripheral arthritis (especially asymmetrical and large lower limb joints)
- Enthesitis (inflammation of tendon, ligament or capsule attachment to bone)
- Dactylitis (‘sausage like’ swelling of a whole ray; in contrast to the swelling of rheumatoid arthritis)
- Skin involvement (when severe and/or with nail changes can be classified as psoriatic arthritis)
- Iritis (type of eye inflammation common across the subgroups)
- Inflammatory bowel disease, eg. ulcerative colitis, Crohn’s disease

**ANKYLOSING SPONDYLITIS**

Ankylosing spondylitis (AS) is an inflammatory disease that affects the axial skeleton causing characteristic inflammatory back pain, which can lead to structural and functional impairments and a decrease in quality of life (Braun & Sieper 2007). Fibrosis and ossification of ligament, tendon and capsule insertion (the entheses) mainly in the regions of the intervertebral discs and sacroiliac joints are hallmarks of the condition (Hakim & Clunie 2002). Inflammatory changes can also occur in the cartilagenous joints of the axial skeleton (symphysis pubis, discovertebral junction and manubrio sternal joint). The disease can sometimes affect the hip joints.

Initial changes usually begin in the sacroiliac joints, lumbosacral and thoracolumbar joints with later change progressing throughout the axial skeleton. The inflammatory process results in ligament ossification and the formation of vertical outgrowths of bone called syndesmophytes. Progressive syndesmophyse growth results in bony union between adjacent vertebrae. In moderate and severe cases there is progressive and irreversible stiffening of the vertebral column (Fig. 19.1). The disease has an insidious onset and typically continues over many years. Left untreated it will usually result in severe spinal deformity and functional limitation.

There is lack of universal agreement over the current classification system for AS (Braun et al 2002). A range of diagnostic criteria have been developed although in the early stages of the disease a person might be diagnosed as having AS without fulfilling all the criteria. The following is a description of the Modified New York criteria (Van der Linden et al 1984):

- Low back pain of at least 3 months duration with inflammatory characteristics
- Limitation of lumbar spine movement in sagittal and frontal planes
- Reduced chest expansion (relative to normal for sex and age)
- Bilateral sacroiliitis grade 2 or higher on x-ray
- Unilateral sacroiliitis grade 3 or higher on x-ray.

Definite ankylosing spondylitis is said to be present when the 4th or 5th criteria is present with one of the clinical criteria (1–3), probable AS can be defined if three clinical criteria are present or the radiographic criterion is present in the absence of signs and symptoms.

**PREVALENCE**

Estimates of AS prevalence have been reported between 0.1–0.2% (McVeigh & Cairns 2006), 0.25–1% (Calin 2004) and 0.5% (Wordsworth 2002). This means...
that whilst patients with AS are commonly seen within rheumatology units AS is relatively uncommon in the community as a whole. The ratio of males to females ranges from 3:1 (Symmons & Bankhead 1994), 2.5:1 (Calin 2004) and 5:1 (McVeigh & Cairns 2006).

**MAIN FEATURES OF AS**

The key characteristics of AS are listed below. They can be grouped under the headings: clinical, non-musculoskeletal and radiographic features.

**Clinical features:**
- Pain; low back pain, alternating buttock pain
- Night pain; woken in second half of night with pain and often needing to get up and move about before resuming sleep
- Improvement of pain on exercise
- Spinal stiffness, predominantly in the morning or after rest
- Postural changes - progressive postural change with an increasingly flexed posture, loss of lumbar lordosis, increase thoracic kyphosis and limitation of trunk lateral flexion and rotation
- Muscle spasm
- Enthesitis (see Fig. 19.2 for common sites).
Non-musculoskeletal features:
- Fatigue
- Iritis
- Lung disease (less than 1%)
- Cardiac disease (less than 1%)

Radiographic features (Fig. 19.3):
- Symmetrical and bilateral changes of sacroiliac joints (sacroilitis) is usual in cases of established disease
- Vertebral squaring
- Syndesmophyte formation with or without vertebral fusion.
- Calcification of vertebral discs.

The first radiological signs of AS are usually evident as x-ray changes in the sacroiliac joints. However in early disease these changes are not always apparent on pelvic x-ray but can be detected on an MRI scan. In severe cases the progressive formation of syndesmophytes and ossification throughout the axial skeleton can lead to a so called ‘bamboo spine’. In addition to affecting the lumbar spine AS commonly affects the thoracic and cervical spine and less commonly the hip joints.

**PSORIATIC ARTHRITIS**

Psoriatic arthritis (PsA) is a chronic heterogeneous disease whose pathogenesis is unknown, although genetic, environmental and immunological factors play major roles (Mease & Goffe 2005). It is a progressive condition and without appropriate treatment results in irreversible joint destruction with resultant disability and functional loss. Psoriasis is a skin disorder affecting 2% of the population characterised by plaques of hyperkeratonic skin commonly on extensor surfaces and in the scalp and occasionally more generalised (Veale & Fitzgerald 2002). The skin disease usually pre-dates the arthritis but in as many as 25% of subjects the arthritis might be synchronous or pre-date the skin disease (Wordsworth 2002). If there is a family history of psoriasis a patient can be diagnosed as having psoriatic arthritis without skin disease being present.

The prevalence of PsA is not well known (Boonen at al 2004). Estimates range from 0.04%–1.2% (Gladman 2006). Sixty percent of patients with PsA will be HLA-B27 positive (Wordsworth 2002). It affects men and women equally, usually between the ages of 20 and 40 years (Hakim & Clunie 2002). PsA may present in one of a number of clinical patterns, the following is based on the description by Gladman (2006):

- Oligoarticular pattern in which four or less large joints are involved in usually an asymmetric distribution.
- Polyantricular pattern (multiple joints) which can appear similar to rheumatoid arthritis (although it is not considered the same condition).
- Predominantly spinal pattern, with sacroiliitis and spondylitis.
- Arthritis mutilans-a form of the disease with severe joint destruction showing characteristic features on x-ray affecting distal interphalangeal joints of hands and feet.
- Distal joint pattern affecting distal interphalangeal joints of hands and feet.

Points 1 and 2 are the commonest presentations. There is some doubt about how strictly PsA exists within these clinical forms (Marsal et al 1999) although four of the five categories can assist in establishing a differential diagnosis (see Ch. 16 to contrast with the features of rheumatoid arthritis).

The clinical and radiographic features are listed below. Patients will not necessarily display all these features especially in early disease.

**Clinical features of PsA**
- Psoriasis
- Nail lesions (e.g. pitting)
- Asymmetrical distribution of arthritis
- Peripheral joint arthritis with or without axial skeletal involvement
- Distal interphalangeal joint arthritis
- Enthesitis
- Dactylitis.
The radiographic (x-ray) features of established psoriatic arthritis
- Erosions of distal interphalageal joints
- Unilateral or bilateral sacroiliac joint changes
- Spondylitis.

**REACTIVE ARTHRITIS AND REITER’S DISEASE**

Reactive arthritis (ReA) is a sterile inflammatory arthropathy, which may develop after bacterial or viral infection. A healthy but genetically predisposed individual develops it following an immune system response to an infection. In the gut this is commonly Shigella, Salmonella or Campylobacter infection, and in the genital tract Chlamydia trachomatis (Toivanen 2000). Typically 60–80% of patients with ReA are HLA-B27 positive (Yu & Fan 2001). Reactive arthritis differs from infectious (septic) arthritis in that the infectious organism cannot be cultured from the joint fluid or synovium.

Reiter’s disease (or Reiter’s syndrome) is currently the term applied to a reactive arthritis displaying specific signs. These are the classic triad of arthritis, urethritis (urethral inflammation) and conjunctivitis (Yu & Fan 2001). The common clinical features are listed below.

Common clinical features (Yu & Fan 2001)
- Asymmetrical synovitis of lower limb joints (especially ankle and knee although wrist and other joints can be involved)
- Dactylitis
- Sacroilitis- 5–10% of patients in early disease and up to 70% if it becomes chronic
- Enthesitis
- Spondylitis.

ReA tends to be a self-limiting condition and 90% of patients recover in the first year (Yu & Fan 2001). It is very important to treat the underlying cause of infection as this settles the arthritis. Treatment is also directed at the joint manifestations of the disease. When reactive arthritis develops as the result of sexually acquired infection it can be called sexually acquired reactive arthritis (SARA). Treatment guidelines are provided for SARA by the British Association for Sexual Health and HIV (2001). It is always important to consider the implications of discussing the history of SARA with the patient when members of their family or friends are present.

**ENTEROPATHIC ARTHRITIS**

Enteropathic arthritis is an inflammatory arthritis of peripheral joints and axial skeleton associated with chronic inflammatory bowel disease. Peripheral arthritis is relatively common in inflammatory bowel disease and its incidence is 10% in ulcerative colitis and 15–20% in Crohn’s disease (Jewell 1993, Shearman & Finlayson 1989, Wollheim 2001). Axial skeletal involvement has been reported as having an incidence of 10–15% in ulcerative colitis and 15–20% in Crohn’s disease (Wollheim 2001). Peripheral arthritis tends to be asymmetrical and affect the larger joints (hips, knees, ankles and wrists). If there is a spondylitis (inflammation of spinal joints) or sacroilitis the course of the disease is independent of the bowel condition. In addition to joint features some patients also experience enthesopathies and inflammatory eye conditions.

**ASSESSMENT**

This section will outline the principles of assessing the spondyloarthropathies and will relate this to intervention by the therapist. Ankylosing spondylitis (AS) is the prototype of the spondyloarthropathies (Braun et al 2002) so this section will focus on assessing AS. The principles of assessing peripheral joint arthritis in SpA and peripheral joint arthritis of other diagnostic types are almost identical so the reader should refer to Chapters 3 and 16 for further detail.

The four clinical features of AS, enthesitis, axial involvement, peripheral articular disease, and extra articular features should be assessed (Dougados & van der Heijde 2002). Some areas of potential extra articular problems (skin, eyes, gut) are outside the normal remit of therapists’ roles and require other members of the team to assess and manage them. The assessment and treatment of foot and ankle problems arising from arthritis or enthesitis is sometimes undertaken by a podiatrist rather than a physiotherapist (see Ch. 13). Box 19.2 highlights the elements of a therapist’s assessment.

It is important for the therapist to remember the context in which they are undertaking their assessment and to gather data relevant to the purpose of the assessment. Often, time will be a factor affecting the amount of data that can be collected but selective use of validated outcome measures can make the process more efficient and effective (see Ch. 4). The emphasis of assessment is likely to vary in different situations; a potential case of undiagnosed SpA is likely to need a different approach to a person newly
diagnosed with AS or assessment undertaken as part of monitoring long term follow up. Therapists can facilitate the rapid referral of suspected SpA to rheumatologists as recommended by the Arthritis and Musculoskeletal Alliance (ARMA 2004). This is especially important in situations of patient self referral for therapy where the patient’s GP has not been consulted. A systematic, analytical process is required to differentiate other forms of spinal pain from AS (Fruth 2006). A simple screening tool, such as the one used in a therapy service in South Devon, may be useful in identifying potentially undiagnosed individuals with early AS presenting directly to therapy services (Box 19.3). Such screening tools warrant further evaluation in clinical practice.

**HISTORY TAKING IN AS**

Thorough history taking is an important part of any assessment. General principles are covered in Chapter 3. In AS and other SpA, certain aspects of history taking such as a description of the problem, its duration and medication used are shared with other clinical conditions. There are certain responses which are suggestive of AS in new referrals lacking definitive diagnosis and they may also be useful in determining the severity of the condition in a known case of AS (Calin et al 1977, Rudwaleit et al 2005).

1. How old were you when it began?
2. Do any close relatives have an inflammatory arthritis?
3. Have you had inflammatory gut problems (Crohn’s disease, ulcerative colitis), inflammatory eye problems (iritis) or psoriasis?
4. Do you have variable buttock pain in both sides? (This pain is associated with AS).

**BOX 19.2** Issues to be addressed by a therapist assessment

- Disease activity
- Function
- Pain
- Mobility
- Fatigue
- Global assessment
- Work status
- Activities of daily living
- Patient beliefs and knowledge

**BOX 19.3** Ankylosing spondylitis therapy screening tool

**Screening questionnaire**

1. In patients under 45 who have had pain for more than 4 months, does the patient have:
   - Early morning stiffness (back +/- neck) > 30 mins? Yes □ No □
   - Back pain improves with exercise? Yes □ No □
   - Awake second half of night with pain/stiffness? Yes □ No □
   - Buttock pain (alternating) Yes □ No □

In patients answering yes in at least two questions HLA-B27 screening is recommended and refer back to GP

**Supplementary questions:**

2. Has the patient ever had iritis (red painful eye)? Yes □ No □
3. Has the patient ever had Achilles tendonitis? Yes □ No □
4. Has the patient ever had plantar fasciitis? Yes □ No □
5. Does the back pain improve with NSAIDs? Yes □ No □
6. Is there a family history of AS? Yes □ No □
7. Does the patient have psoriasis? Yes □ No □
8. Does the patient have Crohns or ulcerative colitis? Yes □ No □
9. Has the patient ever had a peripheral inflammatory arthritis? Yes □ No □
10. Has the patient experienced central chest pain? Yes □ No □

These questions are based on Calin et al (1977) and Rudwaleit et al (2005)
5. Do you wake in the second half of the night because of pain? (Common in AS).
6. Are your joints (especially your back) stiff in the morning? If yes how long? (Signs of stiffness longer than half hour are considered significant).
7. Have you had a warm and swollen joint?
8. Are you better after resting or moving around?
9. Is your back stiff after sitting down?

Box 19.4 provides a comparison of the common features of inflammatory and mechanical back pain.

### SPINAL MEASUREMENT

Measurements less than the normal range for spinal and other joint movements can implicate AS but as far as possible these must be differentiated from non-inflammatory causes. In the lumbar, thoracic and cervical spines this presents as limitation of flexion, extension, rotation and lateral flexion. If peripheral joint limitation is present it most commonly affects the hip and shoulder joints (Fig. 19.4). Measures commonly collected during general assessment of AS (e.g. Fig. 19.5) are published in a handbook provided by the National Ankylosing Spondylitis International Federation (Ankylosing Spondylitis: Assessment Scores, Classification and Diagnostic Criteria) (www.spondylitis-international.org). The measures selected are commonly affected by the disease and therefore data are collected to serve as a baseline by which to measure change and as a way of identifying problems which might need therapeutic intervention (Fig. 19.5). It might be desirable to undertake a more extensive assessment including peripheral joints and this can be done using standard musculoskeletal examination techniques.

### OUTCOME MEASURES IN AS

The selection of an appropriate outcome measure can be a challenging task. Historically measures have been developed to capture the biomedical impairments of AS, e.g. the Stoke Ankylosing Spondylitis Spinal Score (SASSS) (Averns et al 1996). There is now a greater appreciation of other dimensions important to patients (see Ch. 4) and individualised measures (Haywood et al 2003).

### THE BATH INDICES

A suite of measures developed in Bath has been adopted in many UK rheumatology departments.

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**BOX 19.4** Comparison of AS and mechanical back pain

<table>
<thead>
<tr>
<th>Ankylosing Spondylitis</th>
<th>Mechanical Back Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early age of onset (under 45)</td>
<td>Older age (often over 45)</td>
</tr>
<tr>
<td>Insidious onset</td>
<td>Often sudden onset</td>
</tr>
<tr>
<td>Morning stiffness of more than 30 minutes</td>
<td>Morning stiffness less than 15 minutes, pain often worse than stiffness</td>
</tr>
<tr>
<td>Better on activity</td>
<td>No better/worse on activity</td>
</tr>
<tr>
<td>Worse on rest</td>
<td>Often worse pain on sitting, better on standing</td>
</tr>
<tr>
<td>Stiff after sitting</td>
<td>Pain tends not to alternate</td>
</tr>
<tr>
<td>Sacroiliac involvement causing alternating buttock pain</td>
<td>Some movements tend to be more painful than others, frequently some directions preferred over others</td>
</tr>
<tr>
<td>Frequently - pain on movement in all directions, no clear positional/movement preference</td>
<td>Frequent unilateral limitation</td>
</tr>
</tbody>
</table>

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**Figure 19.4** Typical deformities of long standing Ankylosing Spondylitis with loss of normal spinal posture and flexion deformity of the hip.
The Bath indices are a range of outcome measures, which can be used to assess function, disease activity, movement and overall patient assessment of their condition (Fig. 19.5 A–G). The Bath Ankylosing Spondylitis Functional Index (BASFI) is a questionnaire with 10 questions scored on 10 cm visual analogue scales (VAS) (Calin et al 1994). The Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) and the Bath Ankylosing Spondylitis Patient Global Score (BAS-G) are also self-completed questionnaires using visual analogue scales and with the BASFI have all been validated for use in AS (Garrett et al 1994, Jones et al 1996). They are useful not only in establishing baselines on initial presentation but can also be used in ongoing monitoring of disease and function. The Bath Ankylosing Spondylitis Metrology Index (BASMI) was developed to determine the most appropriate clinical measurements for the assessment of AS (Jenkinson et al 1994). The assessor is required to undertake a series of eight measurements in a standardised way. With all four of the Bath indices the individual measurements or responses convert into a score. These can be recorded on each visit and used as a measure of progress. Details of these indices are published by the National Ankylosing Spondylitis Society (NASS) with instructions about how to undertake the scoring (Irons & Jeffries 2004).

In addition to the Bath indices described above, there is the Bath Ankylosing Spondylitis Radiology
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Index (BASRI) and the Bath Ankylosing Spondylitis Index (BASRI-h) which are validated measures for grading the radiographic changes observed in AS (MacKay et al 1998, 2000).

**GENERAL ASSESSMENT OF FUNCTION AND MOVEMENT**

The Bath indices are extremely valuable for monitoring patients and for research. However they are sometimes not sufficiently broad to cover all potential problems. For example, they will not detect movement limitation on lumbar extension or trunk rotation, both common problems in AS, and are amenable to treatment through exercises. For this reason when undertaking initial assessment it might be preferable to use a wider range of measures in addition to the Bath indices. An example of a more extensive range of motion measure is given in Table 19.1. The 13 point enthesitis score (Maastricht Ankylosing Spondylitis Enthesitis Score or MASES) proposed by Heuft-Dorenbosch et al (2003) provides additional useful information (Fig. 19.2). An assessment format containing a range of measures (including modified versions of the Bath indices) is available on the Assessment in AS Working Group (ASAS) website listed at the end of the chapter under useful websites. The assessment of clinical outcome in AS patients present challenges attributable to both the disease process and the measures themselves (Ward 2006). Measures designed for research and classification purposes (e.g. Modified New York Criteria) might not be sufficiently sensitive to detect early or atypical presentations of AS. As with other types of inflammatory arthritis patients with AS and PsA can also have osteoarthritis The clinical presentation of osteoarthritis in the hands (Ch. 17) can sometimes appear similar to early PsA and it is important not to confuse the two conditions.

<table>
<thead>
<tr>
<th>Table 19.1 Ankylosing spondylitis assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DATE</strong></td>
</tr>
<tr>
<td>Tragus to wall Right * CM</td>
</tr>
<tr>
<td>Tragus to wall Left * CM</td>
</tr>
<tr>
<td>Chest Expansion CM</td>
</tr>
<tr>
<td>Modified Schober's index flexion CM</td>
</tr>
<tr>
<td>Lumbar side flexion Right * CM</td>
</tr>
<tr>
<td>Lumbar side flexion Left * CM</td>
</tr>
<tr>
<td>Cervical flexion Degrees</td>
</tr>
<tr>
<td>Cervical extension Degrees</td>
</tr>
<tr>
<td>Cervical side flexion right Degrees</td>
</tr>
<tr>
<td>Cervical side flexion left Degrees</td>
</tr>
<tr>
<td>Cervical rotation lying right * Degrees</td>
</tr>
<tr>
<td>Cervical rotation lying left * Degrees</td>
</tr>
<tr>
<td>Hip intermalleolar distance * CM</td>
</tr>
<tr>
<td>Hip lateral rotation right Degrees</td>
</tr>
<tr>
<td>Hip lateral rotation left Degrees</td>
</tr>
<tr>
<td>Hip medial rotation right Degrees</td>
</tr>
<tr>
<td>Hip medial rotation left Degrees</td>
</tr>
<tr>
<td>Hip flexion right Degrees</td>
</tr>
<tr>
<td>Hip flexion left Degrees</td>
</tr>
<tr>
<td>Shoulder flexion right Degrees</td>
</tr>
<tr>
<td>Shoulder flexion left Degrees</td>
</tr>
</tbody>
</table>

**SIGNED**

Name.................. Ref Number.................. Date of Birth..................

Items with asterisk [*] comprise measures used in the Bath Ankylosing Spondylitis Metrology Index (BASMI). BASMI consists of scores derived from: tragus to wall distance (left and right), lumbar side flexion in standing (left and right) modified Schöber's index on flexion, cervical rotation in supine lying (left and right) and intermalleolar distance in supine lying. The positions for measuring BASMI measurement are illustrated in Figure 19.5. Refer to Irons & Jefferies (2004) to convert these measure to the scores used in BASMI. However they are also useful as stand alone measures.
Reactive arthritis and enteropathic arthritis tend to affect limited numbers of peripheral joints. The principles of therapy are similar for people affected by other types of arthritis. This current section will mainly concentrate on therapy for ankylosing spondylitis.

The medical management of AS is a continually developing area. Early diagnosis is difficult but important and patients with inflammatory back pain should be referred at an early stage to a rheumatologist (ARMA 2004, McVeigh & Cairns 2006). Conventional treatment consists of non-steroidal anti-inflammatory drugs (NSAIDs), intra-articular corticosteroid injections and limited use of surgery where there is significant spinal deformity (Dougados & van der Heijde 2002). Exercise (including hydrotherapy) is also an established part of conventional treatment. Therapy needs to be coordinated with medical treatment to benefit from the optimal effect of medication and to ensure an integrated team approach. More severe cases would need a timely referral to occupational therapy.

Assessment in AS Working Group (ASAS)/EULAR recommendations for the management of AS include:

- Individually tailored treatment programmes
- Use of appropriate methods of disease monitoring
- A combined approach based on pharmacological and non-pharmacological treatments
- Non-pharmacological treatments should include patient education, exercise, and patient self help strategies
- Pharmacological approaches should be based on the best evidence (Zochling et al 2006).

Current best evidence for pharmacological treatment includes limited evidence for conventional disease modifying therapy (e.g. Methotrexate, Sulfasalazine) in patients with axial disease alone. However there is evidence of benefit for Sulfasalazine (SAS), Methotrexate (MTX) and Leflunomide in treating peripheral joint disease in AS, psoriatic arthritis and enteropathic arthritis (see Ch. 15). There is also good evidence of benefit for the use of biologic therapies (e.g. Infliximab, Adalimumab, Etanercept) in AS, PsA and enteropathic arthritis (BSR 2004, Chen & Liu 2005, Chen et al 2006, Jones et al 2000, NICE 2006, 2007, Woolacott et al 2006). The reader should refer to Chapter 15 for a general review of pharmacological approaches in rheumatology.

Non-pharmacological interventions can be targeted to the following:
- Pain
- Spinal mobility
- Stiffness
- Function
- Fatigue
- Peripheral joint involvement
- Enthesitis
- Patient education
- Patient long term monitoring.

Health education and advice are central to therapists’ interventions. Chapter 6 addresses the principles more fully.

**EXERCISE THERAPY IN ANKYLOSING SPONDYLITIS**

Compared to the medical treatment of AS and PsA evidence for physiotherapy and occupational therapy in these conditions is more limited (Fransen 2004). The majority of research focuses on exercise therapy and it forms a central component in managing the disease. There is limited evidence to support the efficacy of exercise therapy for AS patients, although there is the need for further research (Dagfinrud et al 2004). In addition to mobility exercises, patients with AS potentially benefit from cardiovascular exercise and exercises to improve their breathing (Ince et al 2006). Current opinion favours the use of exercise programmes combining trunk, neck and peripheral range of movement exercises. These should be performed on a daily basis with additional limited numbers of stretches when possible being performed after sustaining any fixed posture. The National Ankylosing Spondylitis Society (NASS) provides a guide to a basic exercise programme in their education booklet (NASS 2007) and on their website (www.nass.co.uk). It is important to emphasise stretches to improve the movement limitation specific to an individual patient as well as promoting the importance of routine exercise as a way of preventing long term deformity especially the kyphotic postural deformity which can occur. Exercise in water is a useful addition to a home exercise programme and there is evidence to support its use in AS (van Tubergen & Hidding 2002). Water-based exercise is useful for mobility, cardiovascular fitness and strength. There are many NASS groups around the UK, which use hospital facilities for water based and gym exercise classes. Exercise needs
to become part of the daily lifestyle of a person with AS, not something they perform on rare occasions, and such groups can provide peer support.

Adequate pre-exercise assessment of patients should be undertaken to screen for risks associated with AS. These include

- Pseudoarthrosis
- Osteoporosis (including vertebral crush fractures)
- Heart abnormalities
- Joint replacements (total hip replacement is the commonest in AS)
- Severely restricted breathing
- Atlanto-occipital/atlanto-axial subluxation. (Dziedzic 1999)

None of these is an absolute barrier to exercise but if present only appropriate exercises should be performed. In these situations (and in rare cases when AS is combined with another condition affecting movement e.g. Parkinson’s disease) it is important to gain the opinion of a therapist specialising in such conditions for additional advice.

The Arthritis Research Campaign (arc) also publishes literature on AS, PsA and a wide range of other rheumatological conditions (www.arc.org.uk).

**FUNCTIONING IN ANKYLOSING SPONDYLITIS**

Closely associated with education about exercise is the promotion of good posture as a way of preventing pain, stiffness and long term deformity. Advice about sitting positions and other static postures should also be included. This is very relevant to patients who undertake large amounts of driving or whose work is office based. Sitting reinforces the flexed spinal deformity of AS as a result of the naturally slumped posture adopted when sat for long periods. Research demonstrates the major impact of AS on employment (e.g. Boonen et al 2001, Boonen et al 2002). Technical and ergonomic adaptation of the workplace can reduce the risk of withdrawal from the workforce due to AS (Chorus et al 2002). Therapists should be able to advise about the principles of workplace ergonomics especially in jobs involving prolonged static postures such as sitting or flexed standing. Office seating for employees with AS can affect the levels of comfort experienced when sat at work (Sweeney & Clarke 1990). Patients might need individual assessment of their seating as well as assessment of workstation design and layout. Night time posture should be addressed by attention to pillows and mattresses (Gall et al 2000).

**BOX 19.5 Intervention plan for patients with spondyloarthopathies**

| Pain | Exercise, hydrotherapy, relaxation, external modalities (e.g. TENS), thermal treatment (hot/cold), correction of posture, use of appliances, ergonomic improvement |
| Spinal mobility & Stiffness | Exercise, correction of posture |
| Function | Activities of daily living assessment, ergonomic assessment and adaptation, use of appropriate appliances |
| Fatigue | Pacing, energy conservation, improved sleep posture |
| Peripheral joint involvement | As for spinal involvement |
| Enthesitis | Orthoses for foot/ankle enthesitis |
| Patient education | One-to-one advice, use of literature, patient education groups, patient self help groups (e.g. NASS) |
| Patient long-term monitoring | Use of validated measures (e.g. Bath indices), regular contact, clinics combined with other health professionals (e.g. rheumatologists, clinical nurse specialists) |

**OTHER CONSIDERATIONS IN PSORIATIC ARTHRITIS**

Peripheral joint arthritis associated with AS and other conditions in the SpA group can be approached by therapists in a similar way to inflammatory arthritis of other types. When enthesitis is present (Fig. 19.6) it imposes a potentially modifying...
### CASE STUDY 19.1 PATIENT WITHOUT A PREVIOUS DIAGNOSIS OF SPONDYLOARTHROPATHY (SpA)

Mr Worth is a 31-year-old with low back, neck and scapular pain. The GP’s surgery gives an option of self-referral to the practice-based physiotherapy service instead of making an appointment with one of the GPs. Mr Worth decided to see the physiotherapist with his problem as he was finding it hard to cope with the physical demands of working in a local hospital. On his initial assessment he described a 10 year history of intermittent back pain. The recent episode of neck and back pain began in the last 6 months without any specific trauma. Although he liked sport he had stopped playing squash during the last few months because of the pain it caused afterwards. Mornings were his worst time of the day for pain and stiffness, and he was getting up an hour earlier than usual to allow time to dress. It took at least an hour for the back stiffness to improve once he got up. He was trying to avoid sitting too long at work because it made his pain and stiffness worse when he got up, and he felt better keeping moving. His general health was good but reported one episode of what he described as iritis 3 years earlier.

On examination the physiotherapist found reduced lumbar spine flexibility with a modified Schober’s index on flexion of 5 cms, reduced lumbar side flexion and a small reduction in cervical rotation. There was normal range of motion in the hips but low back pain was elicited at end of range on hip rotation. Some muscle spasm was present on palpation of the lumbar region. Chest expansion was within normal range but caused some thoracic pain. The physiotherapist suspected that the problems might be arising from an inflammatory arthritis and after giving advice about posture, pain relief and gentle range of movement exercises, made an urgent appointment for Mr Worth with the GP. The GP referred him to the rheumatology department and the patient was diagnosed as having AS within 13 weeks of referring himself to the physiotherapist.

### CASE STUDY 19.2 PATIENT WITH ESTABLISHED ANKYLOSING SPONDYLITIS (AS)

Mr Butters is a 35-year-old office manager who was referred by the rheumatologist to the specialist rheumatology physiotherapist in the rheumatology multidisciplinary team. Mr Butters had stopped attending yearly rheumatology clinic reviews for his AS about three years ago but had been referred back by his GP because he had been signed off sick from work due to the pain he was having and because of deteriorating function. Mr Butters had found it hard to fit regular rheumatology reviews in with work. He had also gradually reduced the amount of exercises he had been doing until he had stopped them altogether. His job involved prolonged sitting so during the day he was working in a fixed posture for hours at a time.

On assessment he displayed increased tragus to wall distance, reduced chest expansion and a flexed posture. Modified Schober’s index on flexion was 2 cm. and there was reduced range of lumbar side flexion. Cervical movement was reduced in all directions. There was some restriction of hip range of movement with intermalleolar distance reduced. The physiotherapist initiated an intensive course of hydrotherapy and exercises. His home exercise programme was reviewed and modified to allow him to do some at work. The patient was introduced to evening hydrotherapy sessions run by the local NASS branch to allow him to have regular hydrotherapy when he returned to work. He was also encouraged to access the NASS website to gain more information about AS. The occupational therapist gave advice about seating, pillows and how to pace his physical activity.

In addition to addressing the patient’s pain and function the rheumatologist requested that the physiotherapists undertook an assessment of the patient using the Bath indices. These were used to determine the patient’s eligibility to receive anti TNF therapy according to NICE guidelines. As the patient was eligible for treatment, regular reviews in the rheumatology clinic were required. The physiotherapist supported the rheumatologist in the review process.

### Factor on the advice, exercise and functional adaptation used in inflammatory arthritis. The pain of enthesitis can be helped through orthoses (eg heel pads) as left untreated it can cause gait disruption as a result of the pain (see Ch. 13). Appropriate exercises such as Achilles tendon stretches might be helpful. Deformities of PsA are often treated with splints and supports (see Ch. 12). Some degree of splint modification might be required if psoriatic plaques are irritated by splint contact (Melvin 1989).

Box 19.5 summarises a nonpharmacological intervention plan for patients with Spondyloarthropathies. Further information on interventions can be found in the preceding chapters. General
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information on spondyloarthropathies, latest editions of guidelines and most recent evidence can be accessed via the websites listed at the end of this chapter. In addition a number of authoritative associations and organisations are given to facilitate searches for recent evidence. The internet contains large amounts of unreliable information about AS and psoriatic arthritis so it is important to become familiar with the information provided by organisations such as the National Ankylosing Spondylitis Society (NASS), Ankylosing Spondylitis International Federation (ASIF), the British Society for Rheumatology (BSR), Arthritis Research Campaign (arc), the European League Against Rheumatism (EULAR) and the American College of Rheumatology (ACR).

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STUDY ACTIVITIES

1. Describe the possible impact of ankylosing spondylitis in a female who
   - has sedentary occupation (e.g. taxi driver, call centre worker)
   - is self-employed shop owner
   How might regular hospital appointments for physiotherapy and occupational therapy affect a) and b)? Would adaptations in the workplace be helpful?

2. What advice would you give about exercise to a newly diagnosed patient with ankylosing spondylitis? Which website(s) or resources might you recommend to the patient?

3. Which website(s) and sources could you use to get the most up to date guidelines on the treatment of psoriatic arthritis?

USEFUL WEBSITES

The following websites are useful sources of information. All accessed March 2009.

General.

Ankylosing spondylitis.
http://www.arc.org.uk/arthinfo/patpubs/6001/6001.asp.
http://www.asresearch.co.uk.
http://www.astretch.co.uk.

Psoriatic arthritis.
http://www.arc.org.uk/arthinfo/patpubs/6029/6029.asp.
http://www.nice.org.uk/enter/ search term "psoriatic arthritis".

Reactive arthritis/SARA.
http://www.arc.org.uk/arthinfo/patpubs/6034/6034.asp.
http://www.bashh.org/ enter search term "arthritis".

Crohn’s disease and colitis.
http://www.nacc.org.uk/content/home.asp.
http://www.nlm.nih.gov/medlineplus/ enter search term "IBD arthritis"
References and further reading


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