Exercise and ankylosing spondylitis

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PHYSIOTHERAPY, defined as treatment guided by a physiotherapist primarily aiming at improving physical function, has been used in rheumatic diseases for many centuries. Since ankylosing spondylitis (AS) leads to variable degrees of restricted mobility of the spine with loss of functional capacity and pain, physiotherapy is regarded as an important part of its management. Indeed, intensive physiotherapy is believed to be the main therapeutic option for functional recovery and pain relief in AS. The physiotherapist may provide specific instructions and patient education to individual patients or groups of patients and may act passively (‘hands on’, eg. massage) or actively (exercise prescription and supervision). Various physical modalities such as heat, cold, pulsed short-wave therapy, local ultrasound, interventional therapy, transcutaneous electrical nerve stimulation and acupuncture have been reported in the management of AS. The aim of these modalities is to alleviate pain and improve physical function in AS.

Outcome measures used in the management of AS include the Bath AS disease activity index (BASDAI), Bath AS functional index (BASFI) and Bath AS metrology index (BASMI measures spinal and hip mobility). An annual review by a physiotherapist using these measures is recommended to monitor progression.

The focus of this article is on physical activity and AS. It is widely recognised by rheumatology experts that a daily exercise programme is one of the most important, perhaps the single most important aspect of the management of AS. An exercise programme is defined as a personalised regimen of recommended exercises and physical activity, specifically and systematically designed, and usually targets the affected structures (ie. spine and hips in AS) but should also include general aerobic activity.

Exercise programmes prescribed by physiotherapists are used both preventively and therapeutically and aim at maintaining normal function or improving impaired function. Regular exercises have been shown to produce one or more of the following training effects in normal populations: strength, strength-endurance, aerobic fitness, mobility, and co-ordination, as well as improved mobility in AS patients.

Posture and gait
Specific exercises, such as spinal extension, need to be performed at least twice daily to maintain good posture and spinal mobility. Patients should be advised on proper posture during activities of daily living, including walking, sitting and sleeping. This includes sleeping on a firm mattress with a thin pillow, or with a contoured pillow to maintain neck extension and prevent the development of spinal deformities. They should walk erect, keeping the spine as straight as possible while maintaining normal, reciprocal arm swing and rotational movements of the lower spine and pelvis.

They should avoid activities that cause strain on back muscles, such as prolonged stooping or bending. Posture can be monitored using occiput-to-wall distance, which should be measured with the patient standing against the wall, and chin parallel to the floor. Body height should also be checked on a regular basis.

Patients should avoid positions that may lead to a stooped posture, such as slouching in chairs or leaning over a desk for prolonged periods; stretches should be performed regularly. Patients who work with computers, for example, can use a slightly tilted table to avoid a bending posture. To maintain hip extension, a 15-minute period of prone lying daily is advised. A rolled towel under the forehead may help turning the head to the side. In case of inability to lie flat in the prone position, the patient can use a pillow under the abdomen; or the patient can lie supine with the buttocks at the edge of the bed and the hips extended.

Patients should be encouraged to swim regularly if they can and should be encouraged to perform deep breathing exercises at least twice daily to maintain a good chest expansion.

Patient concerns
High-impact sports, or those that involve significant abrupt movement of the spine, should be discouraged because of the increased risk of spinal injury. When swimming, patients may use snorkels and masks for breathing if they have restricted motion of the neck. Badminton and walking are good options. Some modifications, such as raising the bicycle handlebars, can be applied in cases of sports that require forward-flexed posture.

Footwear can be adjusted to reduce the impact of some activities on the spine and reduce the discomfort of heel spurs. Patients should also have a period of warm-up to help relieve stiffness and decrease the likelihood of injury. Workplace needs should be evaluated and necessary modifications should be advised. Changing position frequently and taking breaks for stretching helps improve endurance.

Restrictions and disability
Some functional difficulties frequently encountered include dressing, body transfers, lifting and carrying and endurance. Problems in performing activities of daily living should be identified.
Continuing Education

Rehabilitation considerations

- Encourage physical activities that promote extension (e.g., reading newspaper while lying prone on floor)
- Promote use of stretching exercise for the lower back, hips and shoulders. Stretch should be held for 30 seconds
- Aerobic exercise should be encouraged to promote general fitness
- Use of interval training of three sets of 10 minutes of exercise versus 30 minutes can be used in patients with more severe cardiovascular involvement
- Swimming strokes, such as breaststroke and freestyle, promote extension while building strength
- Recommend use of proper footwear and orthotics, if necessary, to prevent onset or exacerbation of Achilles tendonitis and plantar fascitis
- Encourage respiratory exercises (deep breathing) to promote chest mobility
- Encourage use of proper posture

Recommendations for health and fitness – ACSM guidelines

Physical activity for general health

- **Mode**: Whole body, repetitive activities
- **Intensity**: Moderate; 55-70% age-predicted maximal heart rate; RPE 2-4*
- **Duration**: 30 minutes accumulation (three 10-minute bouts)

Exercise training for muscular fitness (strength and endurance)

- **Mode**: Dynamic, resistance exercise for major muscle groups
- **Frequency**: Two to three days/week on alternate days
- **Volume**: 8-10 exercises; resistance adequate to induce fatigue after 8-12 repetitions; or 10-15 repetitions if > 50-60 years of age or frail
- **Repetitions**: Three to four repetitions for each stretch

*RPE = rating of perceived exertion (Borg Scale 0-10, where 0 is none and 10 is maximal), #PNF = proprioceptive neuromuscular facilitation

and solutions sought to compensate for loss of motion and improve functional capacity. Assistive devices, including ones for walking, can be used in certain cases – such as when there are lower extremity joint problems. Some helpful items include long-handled devices for dressing and reaching, adjustable swivel chairs with lumbar support, and elevated and inclined writing surfaces.

Postural changes that affect balance because of a displacement of the centre of mass of the trunk pose safety concerns. It is important to take measures to prevent falls. Bathrooms should have non-slippery floors and should be equipped with safety measures, such as railings, grab bars and safety mats.

Decreased range of motion of the cervical spine makes driving a real challenge; however, support of the neck and back by seat and headrest can be helpful, and wide-angled mirrors help increase peripheral vision.12

There is no doubt that motivation is of outstanding importance and optimum therapy requires several important ingredients. Firstly, there must be a highly motivated physician who must encourage the patient and refer appropriately to a physiotherapist. Secondly, the patient needs a highly motivated physiotherapist who must inspire the patient to follow a time-consuming rehabilitation programme. Thirdly, the patients themselves must be highly motivated, believing that investment of time and energy into an exercise programme and in participation in general exercise activities will translate into a meaningful improvement in outcome.13

References
1. Mihai C, van der Linden S, de Bie R, Stucki G. Experts beliefs on physiotherapy for patients with ankylosing spondylitis and assessment of their knowledge on published evidence in the field. Results of a questionnaire among international ASAS members. Europa medicoepidemica 2005; 41:149-53

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