

## THE ROLE OF PASSIVE STRETCHING IN THE TREATMENT OF ANKYLOSING SPONDYLITIS

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### SUMMARY

A controlled study of 39 consecutively-admitted patients with ankylosing spondylitis was conducted to assess the effects of daily passive stretching of the hip joints during a 3-week in-patient physiotherapy course. Measurements were performed by an independent assessor on admission, at discharge and six months after discharge.

Results showed that passive stretching resulted in a significant increase in the range of all movements of the hip joints except flexion during the physiotherapy course.

Follow-up at 6 months in seven patients suggested that this increase in range of movement could be maintained by patients who had been performing the stretching exercises regularly.

We suggest that the inclusion of passive stretching of the hip joint in the treatment of patients with ankylosing spondylitis will increase the range of movement and thus improve function and influence posture.

**KEY WORDS:** Ankylosing spondylitis, Hip joints, Exercise.

THE bony changes associated with ankylosing spondylitis (AS) are well known and documented. There is also evidence for soft-tissue involvement including histological, histochemical and electromyographic changes in muscle [1-3] and inflammation at the site of attachment of ligaments and tendons to bone [4].

The aim of this study was to establish whether daily passive stretching of soft tissues around the hip joint in patients suffering from AS could increase the range of movements of the joint and whether any improvement could be maintained by patients over long periods.

### PATIENTS AND METHODS

At the Royal National Hospital for Rheumatic Diseases, Bath, ankylosing-spondylitic patients are admitted for 15-day intensive physiotherapy courses. Active exercises are given in the gymnasium and hydrotherapy pool to strengthen progressively the anti-gravity and postural muscles and to increase mobility of all the joints of the spine, thorax, hips and shoulders.

Thirty-nine consecutively-admitted patients

with typical radiological features of AS and in whom no hip surgery had been performed were allocated at random to a group whose treatment included daily passive stretching movements to the hip joint or to a control group in whom this was not a treatment. The patients were randomized in blocks of nine to give two in the treatment group for every one control.

The stretching procedure comprised a 'contract and relax' technique [5], followed by a passive stretch, i.e. a maximum isometric contraction of a muscle group was obtained in a position of maximum elongation of the antagonist muscle group, followed by relaxation and then a passive stretch of that group. This cycle was repeated three times. Thus, when stretching the hip adductors, the hips were actively abducted as far as possible and resistance was then applied to gain maximal contraction of the adductor muscles. After several seconds the patient was instructed to relax the adductor muscles fully before a passive stretch was applied to increase the range of abduction.

The 27 patients in the stretched group were taught to perform the stretching techniques on themselves and with assistance from a helper. Twelve patients were allocated to the control group.

The following measurements were recorded

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TABLE I  
MEAN RANGE OF MOVEMENT OF THE STRETCHED AND CONTROL GROUPS ON ADMISSION (IN DEGREES EXCEPT WHERE STATED)

Test	Stretched (n = 27)		Control (n = 12)	
	Mean	SD	Mean	SD
1. Flexion	116.5	12.1	110	9.4
2. Extension (knee in extension)	14.9	11.2	12.7	10.3
3. Extension (knee in flexion)	9.6	11.3	7.5	9.8
4. Single abduction	26.9	9.7	26.7	8.7
5. Bilateral abduction (intermalleolar distance in cm)	87.6	21.8	79.4	19.1
6. Medial rotation	25.4	10.4	23.3	8.0
7. Lateral rotation	24.8	9.2	25	7.4

by an independent assessor who did not know to which group the patients had been allocated: flexion, extension with the knee in extension and flexion (to differentiate between tightness of soft tissues over the anterior aspect of the hip joint and stretching of the rectus femoris muscles), single and bilateral abduction and rotation. A modified long-armed goniometer with two small spirit levels was used to measure ranges of movement. This was shown to be reproducible by performing five repeat measurements of each movement on five patients. Details of the measurement methods used and their reproducibility can be obtained from the authors.

Measurements were performed on admission and discharge and again 6 months later in seven stretched patients. The differences between the two groups were analysed using a two-tailed Student's two-sample *t* test.

## RESULTS

The two groups of patients had comparable ranges of movement on admission (Table I). At

the end of the 3-week intensive physiotherapy course, patients showed an increase in the mean range of each movement with the exception of extension in the control group (Table II). Flexion and bilateral abduction showed the greatest improvement in the stretched group. The differences between the two groups for each movement were shown to be statistically significant except for the test on flexion which was not significant at the 5% level. Since only seven patients from the stretched group were measured 6 months after treatment and these were not randomly selected, their results have not been formally analysed. However, summary statistics suggested that they had maintained their improvement and further movement had been achieved in directions other than flexion and abduction.

## DISCUSSION

This study has demonstrated that passive stretching of soft tissues around the hip joint of patients with AS can increase the range of movement, at least in the short term. With careful instruction, patients were able to perform the stretching effectively and good compliance with the exercise regimen over the 6-month period was reported.

Inflammation and subsequent contractures of soft tissues may influence the degree of deformity of joints prior to and after the development of irreversible bony changes. Minimizing contractures of hip flexors and other soft tissues plays an important role in the prevention of deformity. The results of this study show that passive stretching is effective and can be recommended as part of the treatment for AS patients.

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TABLE II  
MEAN CHANGES IN RANGE OF MOVEMENT OF STRETCHED AND CONTROL GROUPS AFTER THREE WEEKS' INTENSIVE TREATMENT (IN DEGREES EXCEPT WHERE STATED); STATISTICAL ANALYSIS USING STUDENT'S TWO-SAMPLE *t* TEST

Test	Stretched (n = 27)		Control (n = 12)		p value
	Mean change	SD	Mean change	SD	
1. Flexion	+7.5	9.9	+3.8	6.9	NS
2. Extension (knee in extension)	+2.4	4.4	-0.4	4.3	<0.02
3. Extension (knee in flexion)	+3.2	4.1	-0.1	4.3	<0.02
4. Single abduction	+3.5	4.4	+0.08	5.6	<0.02
5. Bilateral abduction (intermalleolar distance in cm)	+10.0	7.2	+3.8	6.4	<0.01
6. Medial rotation	+4.7	5.3	+0.9	5.2	<0.02
7. Lateral rotation	+6.6	6.3	+1.0	5.1	<0.01

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