Bahrain Medical Bulletin, Vol.27, No. 3, September 2005

The Relationship Between Clinical Activity And Function In Ankylosing Spondylitis Patients

Jane Kawar, MD* Hisham Al-Sayegh, MD*

Objective: To assess the functional status among patients with ankylosing spondylitis (AS), using the Bath Ankylosing Spondylitis Functional Index (BASFI) and to find its correlation with clinical measures of spinal mobility, back pain and back morning stiffness.

Methods: Fifty-two patients with AS attending the out patient rheumatology clinics were evaluated by assessing:- functional status; the severity of back pain, back morning stiffness and spinal mobility using clinical measures of spinal flexibility (Shober's maneuver, chest expansion and neck rotation).

Results: Patients with severe back morning stiffness (mean 94.3); impaired lumbar and cervical mobility (mean Shober's 1.6 cms, cervical rotation 82.4deg.) showed significant impairment of functional status (P value <0.05) compared with those having back pain and limited chest expansion (P. value > 0.05).

Conclusion: Poor function is significantly associated with severe back morning stiffness, limited cervical and lumbar mobility, which suggests an important role of these measures in following up AS patients.

Bahrain Med Bull 2005;27(2):

Ankylosing Spondylitis is a chronic, systemic inflammatory disorder of the axial skeleton. The main goals of treatment are to control pain but also to improve function. Non-steroidal anti-inflammatory drugs (NSAIDS) and physiotherapy are the main methods of treatment. Clinical and laboratory indicators of disease activity are poor predictors of radiological damage; so assessing the functional ability of the patient by using a clinically relevant method is of great importance.

A number of self-assessment instruments for measuring function among patients with AS are available, including the functional index produced by Dougados[1]. However, they are either not specific for the disease or have not been adequately validated.

The BASFI is an another assessment instrument for measuring function among patients with AS which was developed by a team of physiotherapists, physicians, research associates with a major input from patients with A.S.

In our study we attempted to use the BASFI since it is quick and easy to complete, is reliable and sensitive to change across the whole spectrum of disease. We assessed the relationship of BASFI with several anthropometric measures of spinal mobility, severity of back pain and stiffness.

* Specialist in Medical Rehabilitation and Rheumatology
Royal Medical Services Hospital
Amman, Jordan

METHODS

Fifty-two patients with AS according to the 1984 modified New York criteria were included in the study[2]. Patients had at least three visits to the outpatient rheumatology clinic.They were assessed three times in the outpatient clinic, 3-4 months apart by the following measures:

1. The severity of back pain
2. Severity of back morning stiffness
3. The functional status using the BASFI
4. Spinal flexibility.

All the patients included were males with a mean age of 37.2 years.

Measurements

A. The BASFI was used to measure the functional status of the patients. The final version consists of 8 questions on activities relating to functional anatomy of patients and two additional questions that assess the patients ability to cope with everyday life. The questions reflect activities of daily living as illustrated in Fig. (1). Each question is answered on a 10 cm visual analog scale (VAS), where "Easy" and "Impossible" are at either end of the line to indicate the direction of severity. This improves both the sensitivity of the index to change and its capacity to elicit a range of responses across the entire scale.

PLEASE DRAW A MARK ON EACH LINE BELOW INDCATE YOUR LEVEL OF ABILTY WITH EACH OF THE FOLLOWING ACTIVITIES DURING THE LAST WEEK.

N.B An aid is a piece of equipment which helps you to perform an action or movement.
EXAMPLE:

EASY----------IMPOSSIBLE

putting on your socks or tights without help or aids (e.g sock aid)

EASY----------IMPOSSIBLE

Bending forward from the waist to pick up a pen from the floor without an aid.

EASY----------IMPOSSIBLE

Reaching up to a high shelf without help or aids (e.g helping hand)

EASY----------IMPOSSIBLE

Getting up out of an armless dining room chair without using your hands or any other help.

EASY----------IMPOSSIBLE

Getting up off the floor without help from lying in your back

EASY----------IMPOSSIBLE

Standing unsupported for 10 minutes without discomfort

EASY----------IMPOSSIBLE

Climbing 12-15 steps without using a handrail or walking One foot on each step

EASY----------IMPOSSIBLE

Looking over your shoulder without turning your body

EASY----------IMPOSSIBLE

Doing physically demanding activities (e.g physiotherapy exercises, gardening or sports)

EASY----------IMPOSSIBLE

Doing a full days activities whether at home or at work

EASY----------IMPOSSIBLE

Figure 1. A copy of the BASFI.

B. The severity of back morning stiffness was assessed by asking the patients to rate the intensity of their back stiffness during the preceding week on a scale of 0 to 100 being the most severe back morning stiffness as shown in Fig. (2).

100

No stiffness Very severe stiffness

Figure 2

C. The overall severity of back pain, at the time of interview was assessed, again by asking the patients to rate the intensity of their pain on a scale of 0 to 100 being the worst imaginable pain Fig.(3).

100

No Pain The worst back pain

Figure 3

The spinal mobility was evaluated by using three anthropometric measures in the following order: Schober's maneuver, chest expansion and neck rotation.

Schober's maneuver: Detects limitation of forward flexion of the lumbar spine. It measures mobility of the thoraco-lumbar spine in the direction of extension and flexion by placing a mark at the level of the posterior superior iliac spine and another 10 cm above the mid line. With maximal forward spinal flexion with locked knees, the measured distance should increase form 10 cm to at least 15 cm^3.

Chest expansion: Measured with tape at the fourth intercostal space, xyphoid process with subjects standing. Normal chest expansion is approximately 5 cm^3.

Neck rotation: Neck rotation measured by asking the patient to look over the shoulder while putting a spatula in the mouth as a pointer for measurement. Normal range of neck rotation is 80 deg. to either side.

We selected the three anthropometric measures for their convenience and because normative information was available. Each measurement was taken 3 times by the same physician and the average was recorded.

The patients were divided into two groups regarding the severity of each variable, where the mid-point of each variable was chosen as the point of division (i.e. for back pain and stiffness the point of division was 50; for Schober's and chest expansion 3 cm, and neck rotation 80 deg.). The mean value and mean BASFI for each variable division was calculated as illustrated in table 1.

Table 1.

Variable	Mid point of variable	No.of patients	Mean value	Mean BASFI score	P. value
Back pain	< 50	30	39 . 72	3 . 21	> 0 . 05
	> 50	22	71 . 68	3 . 35	
Back stiffness	< 50	10	42 . 10	3.14	< 0 . 05
	> 50	42	94 . 31	4 . 95	
Shober's maneuver	< 3	37	1. 6	5 . 13	< 0 . 05
	> 3	15	4. 5	3 . 28	
Chest expansion	< 3	7	2 . 7	3 . 50	> 0 . 05
	> 3	45	4 . 6	3 . 73	
Neck rotation	< 80	39	82 . 4	5 . 24	< 0 . 05
	> 80	13	140 . 7	3 . 41	

p. value < 0 . 05

RESULTS

All patients included in the study were males, with a mean age of 37.2 years. Disease duration ranged from one year to 18 years with a mean of 12.6 years. All patients had radiologic evidence of bilateral sacro-iliitis of grade 2 or higher. Forty-seven patients (90.3%) had axial involvement (neck pain, upper and lower back pain). Eleven patients (21.1%) had peripheral joint involvement (knee, ankle, elbow or wrist). Nineteen patients (36.5%) had appendicular (hip and shoulder) joint involvement.

The number of patients having back pain >50 on the pain severity scale was 22 with a mean value of 71.68 and mean BASFI score 3.35. Thirty patients had <50 with a mean value of 39.72 and mean BASFI 3.21 (Table 1). For back morning stiffness 42 patients had >50 on the back stiffness severity scale, mean of 94.3 and mean BASFI for these patients was 4.95. 10 patients had <50, mean 42.10 and mean BASFI 3.14.

For Schober's maneuver 15 patients had lumbar motion >3 cm, mean 4.5 cm and mean BASFI 3.73. 7 patients had an expansion < 3 cm, mean 2.7 cm and mean BASFI 3.5 cm.

For neck rotation 13 patients had neck rotation >80 deg., mean 140.7 deg. And mean BASFI 3.41. 39 patients had rotation <80 deg., mean 82.4 deg. and BASFI 5.24.

DISCUSSION

Therapeutic exercise and NSAIDS constitute the standard approach to spondylitis. Regular exercises are of fundamental importance to prevent or minimize deformity[4]. The aims of treatment in A.S are to control pain and to maintain or improve function, and thus quality of life[5,6].

Function is an important outcome measure in AS. The previous functional assessments were mostly directed towards patients with peripheral arthritis and mainly assessing the function of hands and feet, such as Steinbroker and Stanford Health Assessment Questionnaire (HAQ)[7,8]. These measures have only limited value in AS patients since it is predominantly affects the spine.

The more specific indices such as HAQ-S may not be also sensitive enough to detect change in patients with AS[9]. This makes it difficult for the physicians to measure functional status properly since they realize the fact that the present indices are either inappropriate or insensitive.

Recently efforts have been made to focus on more specific measures of function regarding AS such as the Dougados Functional Index[1].

This functional index is a valid measure of disability and consists of 20 questions corresponding to activities of daily living. But there are problems encountered with this particular index and the patients often find the questions difficult to answer without qualification, and many of the questions are not specific enough in terms of the exact movement or task required. These weaknesses tend to restrict the sensitivity and its capacity to elicit a range or responses across the scale of this particular index.

As a result of these apparent inadequacies in the currant methods of assessing function in AS, a new functional index, a team of physiotherapists, physicians, research associates and patients designed the BASFI.

This instrument consists of 10 questions, specific in their instructions, considered to be clinically relevant and to encompass the appropriate anatomy and reflect the overall level of function of the patient. The questions are simple to understand, specific to a particular action and relevant to assessment of function in AS. Questions were answered on a 10 cm VAS in order to improve both the sensitivity of the index and its capacity to make use of the entire scale of the index. Also the reproducibility of the BASFI is highly significant and, in addition, the patient's perception of

their level of function accurately mirrored that of external observers; therefore we used the BASFI score in our study.

We divided our patients into two main groups regarding the severity of each variable (the point of division was the mid point for each variable) and each result was correlated to BASFI score in order to find out which variable has more effect on functional outcome of AS patients. Our results showed that patients having severe morning stiffness, severe limitation of lumbar and cervical mobility had higher BASFI scores and therefore poorer functional outcome compared with those having severe back pain and limited chest expansion.

CONCLUSION

We believe that physicians should pay more attention in the outpatient clinic to the severity of back stiffness, impaired lumbar and cervical mobility in order to predict future disease outcome in AS patients.

REFERENCES

1. Dougados M, Guegen A, Nakache JP, et al. Evaluation of a functional index and an articular index in ankylosing spondylitis. J Rheumatol 1988;15:302-7.
2. Van der Linden S, Valkenburg HA, Cats A. Evaluation of diagnostic criteria for ankylosing spondylitis. A proposal for medication of the New York criteria. Arthritis Rheum 1984;27:361-8.
3. West S, Johnson RW. Ankylosing Spondylitis. Rheumatology secrets. 2nd edn. 2002, Ch 38, 256.
4. Khan MA. Ankylosing Spondylitis: Management. In: Primer on the Rheumatic Disease. 11th edn. 1997, CH. 11, 192-193.
5. Jenkison TR, Mallorie PA, Whitelock HC, et al. Defining spinal mobility in ankylosing spondylitis: The Bath AS metrology index. Br J Rheumatol 1993; (suppl 1): 65.
6. Hidding A, Van der Linden S, Boers M, et al. Is group physical therapy superior to individualized therapy in ankylosing spondylitis? Arthritis Care Res 1993;6:117-25.
7. Brocker SO, Traeger CH, Batterman RC. Therapeutic criteria in rheumatoid arthritis. JAMA 1949;140:659-62.
8. Fries JF, Spits P, Kraines RG, et al. Measurement of patient outcome in arthritis. Arthritis Rheum 1980;23:137-45.
9. Daltroy LH, Larson MG, Roberts WN, et al. A modification of the Health Assessment Questionnaire for the spondylo arthropathies. J Rheumatol 1990;17:946-50.