



Egyptian Society of Rheumatic Diseases

The Egyptian Rheumatologist

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ORIGINAL ARTICLE

Limit of the available spine radiologic scoring methods in ankylosing spondylitis when the facet joint is the only structure involved



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Received 29 August 2015; accepted 29 August 2015

Available online 9 October 2015

KEYWORDS

Ankylosing spondylitis;
Facet joint;
Zygoapophyseal joint;
Radiological scoring methods;
Spinal mobility

Abstract *Background:* Ankylosing spondylitis (AS) is a chronic inflammatory disease that affects the axial skeleton and can lead to complete ankylosis of the involved joint. Unfortunately, involvement of the facet joints (FJ) is not evaluated by the available scoring methods that are supposed to quantify the structural damage of the spine.

Aim of the work: The aim of the present study we assessed is the involvement of FJ in Tunisian AS patients with low radiological score.

Patients and methods: Results of 8 AS patients (7 men; 1 woman) with FJ involvement and low radiological scores were retrospectively studied. Their median age was 36 years, age at onset 26 and disease duration of 10 years. The Bath AS Radiology Index (BASRI) and the Stoke AS Spinal Score (SASSS) were calculated in all patients from the radiographs of lateral cervical spine, anteroposterior and lateral lumbar spine.

Results: All patients had FJ ankylosis without involvement of the anterior part of the spine. Six patients (75%) had inflammatory back pain and 2 had bilateral hip pain with radiological involvement. Cervical spine limitation was noted in 4 patients. Limited lumbar spine mobility and bilateral sacroiliitis were present in all cases. The HLA-B27 typing was positive in 6/7 cases. Five patients had restrictive lung disease and 3 had osteoporosis.

Conclusion: Involvement of FJ in AS may be the only sign of spine damage and may be responsible for functional impairment, however, it is not evaluated by the available radiographic scores which is an important limitation to their use.

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Peer review under responsibility of Egyptian Society of Rheumatic Diseases.

<http://dx.doi.org/10.1016/j.ejr.2015.08.004>

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1. Introduction

Ankylosing spondylitis (AS) is a relatively common disease in Caucasian populations, with a reported prevalence ranging

from 0.2% to 0.8% [1]. It is the second most common chronic inflammatory joint disease after rheumatoid arthritis and causes substantial functional impairment [2]. Ankylosing spondylitis in Tunisia is a major socioeconomic burden associated to increased disease activity and working withdrawals which mandates appropriate early treatment [2,3]. Ankylosing spondylitis is one of the axial spondyloarthritis (SpA) that is genetically linked with an increased association to human leukocyte antigen (HLA B27) [4]. Positive HLA-B27 was reported in almost half of the Tunisian patients with AS [5,6]. Chronic inflammation in AS primarily affects the axial skeleton, but larger peripheral joints may also be involved. Fibrosis and secondary ossification can result in complete ankylosis of the involved joints, leading to severe disability [1]. In such patients, fusion of the facet joints (FJ), in addition to ankylosis of the intervertebral space, is a predominant finding.

In addition to clinical findings, imaging, mainly conventional radiography and magnetic resonance imaging (MRI) are important tools for classification and diagnosis of SpA. Imaging plays an important role in all criteria sets [4]. Radiography remains the cornerstone of diagnosis of the sacroiliac joints and spinal structural lesions in AS. The typical radiological findings of spine involvement are erosion, sclerosis, squaring of vertebral bodies, and syndesmophyte formation [2]. There are essentially three different methods that have been described in the literature to score abnormalities in the spine: the Bath AS Radiology Index (BASRI), the Stoke AS Spinal Score (SASSS) and the modified-SASSS [7–11].

Several limits to these radiological scoring methods have been described [12,13] and lack of FJ examination was suggested as another limitation of BASRI and SASSS methods [13]. The aim of the present study we assessed is the involvement of FJ in Tunisian ankylosing spondylitis patients with low radiological score.

2. Patients and methods

Medical records of patients affected by AS, hospitalized in the department of rheumatology in Charles Nicolle hospital in Tunis over a period of 4 years [2007–2010], were retrospectively enrolled. All patients had a complete set of radiographs and met the 1984 modified New York criteria for definite AS [14]. The study was approved by the local university ethics committee and performed in accordance with the ethical standards of the 1964 Helsinki declaration. All patients gave their informed consent during their hospital admission.

Mobility of cervical spine was assessed by the chin to sternum distance, chin to acromion distance and tragus to acromion distance [15]. Mobility of lumbar spine was assessed by finger to floor distance and Schöber index [16].

The BASRI-s, BASRI-SIJ, SASSS score and mSASS score were calculated in all patients from the radiographs of the lateral cervical spine, anteroposterior and lateral lumbar spine. The BASRI is a global grading method of the lateral cervical spine, the anterior and lateral lumbar spine combined, and the sacroiliac joint (SIJ). Each site is scored from 0 (= normal) to 4 (= fusion involving at least three vertebrae). The sum of the sites gives the BASRI (spine), which ranges from 0 to 12. The minimum score is 2 if it is assumed that patients fulfill

the modified New York score and consequently have a score of 2 for the SIJ [8].

The other two scores are more detailed scoring methods assessing the corners of the vertebrae. The SASSS includes the anterior and posterior sites of each lumbar vertebra. Each corner is scored for the presence of squaring, sclerosis, erosions, syndesmophytes and bridging syndesmophytes. The maximal score is 72 [9]. The mSASSS has been published in the international literature by Creemers et al. [10]. The main modification compared with the SASSS is that the posterior sites of the lumbar vertebrae are not scored, and the anterior sites of the cervical vertebrae are added to the scoring method.

Only the AS patients with FJ involvement and whose BASRI-s was ≤ 3 (their BASRI score spine = 0 and their BASRI-SIJ ≤ 3), and SASSS score and mSASSS score = 0 were included in the study.

For each patient, we recorded age, gender, age at disease onset, disease duration, main features and the presence of HLA-B27 antigen. To assess disease activity, physical function, spinal mobility, and global assessment we assessed the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) and Functional Index (BASFI) using the validated Tunisian version [17,18].

Statistical analysis: Data were collected, tabulated and analyzed by SPSS package version 15 (SPSS corporation, USA). Data were described as median (range).

3. Results

During this period of 4 years, 60 AS patients were hospitalized and 8 of them (13%) were included in this study. They were 7 men and one woman with an average age of 36 years. The median age of AS onset was 26 years and median disease duration was 10 years. Six patients had inflammatory back pain; other symptoms were SIJ pain for 2 patients and bilateral hip pain for 2 patients.

Cervical spine limitation was noted in 4 patients; the lumbar spine was limited in all cases. HLA typing performed in 7 patients showed the presence of HLA-B27 in 6 cases. Patients' disease characteristics are resumed in Table 1.

Table 1 Clinical characteristics of the studied ankylosing spondylitis patients ($n = 8$).

Median (range)	AS patients ($n = 8$)	
Age (years)	36	(21–45)
Age at disease onset (years)	26	(17–31)
Disease duration (years)	10	(2–12)
Finger-floor distance (cm)	16.5	(35–10)
Schöber index (cm)	2.6	(0.5–2.9)
Chin to sternum distance	4	(0–8)
Chin to acromion distance	6	(5–8)
Tragus to acromion distance	10	(8–15)
BASDAI (%)	55.3	(25–63)
BASFI (%)	52.6	(35–45)

AS: Ankylosing spondylitis, BASDAI: Bath ankylosing spondylitis disease activity index, BASFI: Bath ankylosing spondylitis functional index.

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