Original papers

sciendo

Internal Medicine 2018 vol. XV No. 5 - www.srmi.ro   **7**

COMPARATIVE ANALYSIS BETWEEN THE BASDAI AND MINI-BASDAI INDICES IN PATIENTS WITH ANKYLOSING SPONDYLITIS

Sandra Burtica[1], Adriana Gurghean[2,3], Ion Bruckner[2,3]

[1]National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, Department of Physical Medicine and Rehabilitation, Bucharest

[2]Colțea' Clinical Hospital, Department of Cardiology, Bucharest

[3]Carol Davila' University of Medicine and Pharmacy, Bucharest

Corresponding author: Sandra Burtica; sandra.burtica@gmail.com

Objectives. *The aim of this paper is to compare the degree of accuracy between the BASDAI and mini-BASDAI indices in assessing the activity of ankylosing spondylitis (AS), especially in patients without peripheral manifestations.*

Materials and method. *Our cross-sectional study consisted of a group of 124 patients with AS, according to the modified New York criteria. All patients offered their informed consent. All the individual characteristics of the patients were documented, both demographic and disease-related. The activity of the disease was measured using the BASDAI questionnaire, from which we calculated the mini-BASDAI by eliminating the questions about peripheral arthritis and entesitis. The functional impairment of mobility in the spine and sacro-iliac joints was measured by the Schober index, lateral spinal flexion, occiput-wall, menton-sternum and finger-ground index.*

Results. *The mean age of the patients was 43.43 +/- 13.27 years, mean height 174.3 +/- 8.46 cm, weight 78.23 +/- 14.19 kg, duration of disease in years 15.06 +/- 9.19 and number of years from initiation of biological therapy 6.42 +/- 3.08. The BASDAI score was 1.26 +/- 1.93, while the mini-BASDAI score was 1.51 +/- 2.08. In the group of patients without peripheral manifestations, both BASDAI and mini-BASDAI correlated significantly with the occiput-wall index, besides ESR, CRP, ASDAS-CRP and the Schober index.*

Conclusion. *Mini-BASDAI is not superior to BASDAI in evaluating patients with ankylosing spondylitis without peripheral manifestations, but it has shown a better correlation in addition to BASDAI with the indices of flexion of the cervico-dorsal spine.*

Keywords: *ankylosing spondylitis, BASDAI, mini-BASDAI, CRP, occiput-wall.*

INTERNAL MEDICINE

Original papers

Rezumat

Obiective. *Scopul acestei lucrări este de a compara gradul de acuratețe dintre indicii BASDAI și mini-BASDAI în evaluarea activității spondilitei anchilozante (SA), în special la pacienții fără manifestări periferice.*

Material și metodă. *Studiul nostru cross-secțional a fost format dintr-un grup de 124 de pacienți cu SA, conform criteriilor modificate New York. Toți pacienții au oferit consimțământul informat. Au fost documentate toate caracteristicile individuale ale pacienților, atât demografice, cât și legate de boală. Activitatea bolii a fost măsurată utilizând chestionarul BASDAI, din care am calculat mini-BASDAI prin eliminarea întrebărilor despre artrita periferică și entezită. Insuficiența funcțională a mobilității în articulațiile coloanei vertebrale și sacro-iliace a fost măsurată prin indicele Schober, flexia laterală a coloanei vertebrale, occiput-perete, menton-stern și indicele deget-sol.*

Rezultate. *Vârsta medie a pacienților a fost de 43.43 +/- 13.27 ani, înălțimea medie 174.3 +/- 8.46 cm, greutatea 78.23 +/- 14.19 kg, durata bolii în ani 15.06 +/- 9.19 și numărul de ani de la inițierea terapiei biologice 6.42 +/- 3.08. Scorul BASDAI a fost de 1.26 +/- 1.93, în timp ce scorul mini-BASDAI a fost de 1.51 +/- 2.08. În grupul de pacienți fără manifestări periferice, atât BASDAI cât și mini-BASDAI s-au corelat semnificativ cu indicele occiput-perete, pe lângă VSH, CRP, ASDAS-CRP și indicele Schober.*

Concluzie. *Mini-BASDAI nu este superior indicelui BASDAI în evaluarea pacienților cu SA fără manifestări periferice, dar a demonstrat o corelație mai bună în plus față de BASDAI cu indicii de flexie ai coloanei vertebrale cervico-dorsale.*

Cuvinte-cheie: *spondilită anchilozantă, BASDAI, mini-BASDAI, CRP, occiput-perete.*

Introduction

Ankylosing spondylitis (AS) is a complex systemic, chronic and autoimmune disease that mainly affects the axial skeleton and has an uncertain etiology. Its main features are inferior inflammatory lumbar pain, due to sacroilitis and spondylitis, frequently associated with entesitis, peripheral arthritis, and anterior uveitis[1]. Symptomatic patients with ankylosing spondylitis become less productive, have a reduced quality of life, and use many health resources[2]. As a result, it is important to identify early signs of disease so that we can offer optimal treatment in time and reduce disease progression. Sieper J. et al. have demonstrated that the most disturbing symptoms that affect the quality of life of these patients are mainly due to joint stiffness (90%) and pain (83%) and to a lower proportion to fatigue (62%), sleep problems 54%) or adverse effects of specific medication (51%)[2].

Generally, ankylosing spondylitis begins in the second or third decade of life, with more frequent involvement of peripheral joints in young patients[3]. Men are also affected by this disease about two to three times more frequently than women[4], with a more serious illness among males than among women[5]. In order to monitor the activity as well as to better evaluate and optimize the treatment of the disease in patients with ankylosing spondylitis, a series of clinical parameters developed by the British Society of Rheumatology and worlwide known - The Bath Indicators – are being used. The Bath indices are represented by four clinical monitoring indices: BASDAI (The Bath Ankylosing Spondylitis Disease Activity Index), BASMI (The Bath Ankylosing Spondylitis Metrology Index), BASFI (The Bath Ankylosing Spondylitis Functional Index) and BAS-G (The Bath Ankylosing Spondylitis Patient Global Score)[6].

Research has established that there is no global index to accurately measure the precise activity of AS, which is why the BASDAI index remains the cornerstone in doing so, with $p < 0.001$[6]. This index measures the main symptoms of patients with ankylosing spondylitis on a scale of 0 to 10, namely: back pain, fatigue, joint pains / swelling, and early morning stiffness from the last week of illness. Thus, the AS' activity score can be calculated as well as the degree of severity of the disease. The mini-BASDAI index consists of the BASDAI index without the two questions reffering to peripheral manifestations (questions 4 and 5), and may be of greater relevance to patients with ankylosing spondylitis without peripheral manifestations.

Objectives

The aim of this paper is to compare the degree of accuracy between the BASDAI and the mini-BASDAI indices in assessing the activity of ankylosing spondylitis, especially in patients without peripheral manifestations.

Materials and method

In our cross-sectional study, a group of 124 patients with ankylosing spondylitis, according to the modified New York criteria, were admitted to the rheumatology clinics in two hospitals. All patients offered their informed consent. All the individual characteristics of the patients were documented, both demographic and disease-related, the type of articular involvement, the presence of HLA-B27 antigen, the BASDAI score, the mini-BASDAI

INTERNAL MEDICINE

Original papers

score, the functional impairment of the spinal mobility, the disease score "Assess Disease Activity in Ankylosing Spondylitis" correlated with C-reactive protein (ASDAS-CRP), as well as the markers of inflammation in the blood. All variables have been analyzed since the first hospital admission of patients, information obtained both from the patients' records, as well as from their presentation in the clinic, depending on the case.

The activity of the disease was measured using the BASDAI questionnaire, from which we calculated the mini-BASDAI index by eliminating the questions about the peripheral arthritis and entesitis (questions 3 and 4). The BASDAI questionnaire consists of 6 questions in which the patient responds on a 10-cm visual analogue scale (VAS) to questions about fatigue, spinal pain, joint pain or articular swelling, localized tenderness, the severity of the pain, and the duration of stiffness.

The functional impairment of mobility in the spine and sacro-iliac joints was measured by the Schober index, the lateral spinal flexion index, the occiput-wall index, the menton-sternum index, and the finger-ground index.

The markers of inflammation were monitored by the C-reactive protein (CRP) and the erythrocyte sedimentation rate (ESR), while peripheral arthritis was revealed by the presence of at least one swollen joint and entesitis in at least one affected region. We divided the population into two groups: the "P +" group representing patients with peripheral arthritis or entesitis and the "P-" group representing patients without peripheral manifestations.

Statistical processing was performed using SPSS for Windows, with a statistical significance level set at $p < 0.05$, the disease parameters being analyzed using descriptive data and presented as average +/- standard deviation.

The correlations between BASDAI and mini-BASDAI with disease parameters were evaluated using Pearson's correlation rank tests.

Differences between disease variables in patients in the "P +" group compared to those in the "P-" group were analyzed by Z, Wilcoxon, Asymptotic significance and Mann-Whitney U tests.

Results

The group consisted of 124 patients with ankylosing spondylitis according to the modified New York criteria. Their mean age was 43.43 +/- 13.27 years, mean height 174.3 +/- 8.46 cm, weight 78.23 +/- 14.19 kg, duration of disease in years 15.06 +/- 9.19 and number of years from initiation of biological therapy 6.42 +/- 3.08 (Table 1.1). Of these, the smoker / non-smoker ratio averaged 1.82 +/- 0.38. The BASDAI score

	N	Mean	Standard deviation	Minimum	Maximum
Height	124	174.30	8.464	157	195
Weight	124	78.23	14.193	49	118
Smoker/ Non-smoker	124	1.82	.384	1	2
Duration of disease in years	124	15.06	9.198	3	48
Number of years from the initiation of biological therapy	124	6.42	3.084	1	15
BASDAI	124	1.269	1.9396	.0	9.2
Mini-BASDAI	124	1.5179	2.08322	.00	9.60
ESR	124	16.56	14.714	2	79
CRP	124	11.0323	26.48742	.20	187.66
Schober	124	3.719	1.9487	.0	10.0
Lateral flexion	124	13.891	5.2702	2.5	30.0
Occiput-wall	124	2.56	4.848	0	23
Menton-sternum	124	1.806	2.6455	.0	11.0
Finger-ground	124	17.06	14.842	0	85
ASDAS-CRP	124	1.6281	1.16988	.64	6.31
NSAIDs YES/NO	124	1.21	.409	1	2
Number of biological molecules used	124	1.44	.778	1	5
s-DMARD YES/NO	124	1.55	.500	1	2

Table 1.1. *Demographic and disease characteristics of patients (ASDAS-CRP - Ankylosing Spondylitis Disease Activity Scor*

INTERNAL MEDICINE

Original papers

	BASDAI	Mini-BASDAI
N	124	124
Mean	1.269	1.5179
Median	.400	.6000
Standard deviation	1.9396	2.08322
Variant	3.762	4.340
Rank	9.2	9.60
Minimum	.0	.00
Maximum	9.2	9.60
Percentile 25	.200	.3000
Percentile 50	.400	.6000
Percentile 75	1.400	2.0000

Table 1.2. *Comparative Analysis between the BASDAI (The Bath Ankylosing Spondylitis Disease Activity Index) and mini-BASDAI*

was 1.26 +/- 1.9396, while the mini-BASDAI score was 1.51 +/- 2.08. The rate of sedimentation of the red blood cells was on average 16.56 +/- 14.71 and the CRP was 11.03 +/- 26.48. Of the spine mobility indexes, the values were as follows: Schober = 3.71 +/- 1.94, lateral flexion = 13.89 +/- 5.27, occiput-wall = 2.56 +/- 4.84, chin-sternum = 1.80 +/- 2.64 and finger-ground index = 17.06 +/- 14.84. The ASDAS-CRP index of the AS disease had average values of 1.62 +/- 1.16. The ratio of patients under steroidal anti-inflammatory therapy versus non-NSAID patients was 1.21 +/- 0.40, whereas the ratio of patients treated with anti-rheumatic disease-modifying drugs (s-DMARD) versus those without s-DMARD was 1.55 +/- 0.50. The number of biological drugs exchanged by patients over the years in AS was averaged 1.44 +/- 0.77. (Table 1.1) The comparative analysis between BASDAI and mini-BASDAI is shown in Table 1.2.

In the group of patients with peripheral manifestations ("P +"), BASDAI significantly correlated (p <0.01) with ESR, CRP, the Schober index and ASDAS-CRP, while in the group of patients without peripheral manifestations (P-) it correlated (p <0.01) with CRP, Schober index, occiput-wall, menton-sternum and ASDAS-CRP. Other significant correlations, with p<0.05, were between BASDAI and the menton-sternum index in the "P +" lot and in the "P-" group

Original papers

Internal Medicine 2018 vol. XV No. 5 - www.srmi.ro   **13**

between BASDAI and ESR. In the "P +" group, mini-BASDAI correlated significantly (p <0.01) with ESR, CRP, Schober, menton-sternum and ASDAS- CRP, whereas in the "P-" group it correlated significantly (p<0.01) with ESR, CRP, Schober, occiput-wall, menton-sternum and ASDAS-CRP.

The mini-BASDAI index also correlated (p <0.05) with the finger-ground index, both in the "P +" and "P-" groups.

Patients with peripheral involvement of the joints ("P +") had higher disease activity, the mini-BASDAI index having higher values in this group of patients as compared to BASDAI.

Discussions

In this study, we analyzed the relationship between the BASDAI and mini-BASDAI questionnaires in relation to disease parameters in patients with ankylosing spondylitis.

For patients with peripheral manifestations, both BASDAI and mini-BASDAI correlated with the markers of disease activity, in particular ESR, CRP, ASDAS-CRP, and the Schober index. The mini-BASDAI questionnaire also demonstrated a good association with the menton-sternum distance, the index of flexion of the cervical and dorsal spine. BASDAI, mini-BASDAI, ESR and CRP values were higher for the group of patients with peripheral manifestations, as demonstrated by Hakkou et al.[7], and by Song et al[8].

In the group of patients without peripheral manifestations, both BASDAI and mini-BASDAI correlated significantly with the occiput-wall index, besides all the other indices with which they correlated in the "P +" lot. The mini-BASDAI values were higher for both groups of patients, which was also

demonstrated by Hakkou et al.[7] and Song et al.[8], but also by Heuft-Dorenbosch et al.[9] Song et al. also demonstrated that the sensitivity to change was similar between BASDAI and mini-BASDAI in patients undergoing biological treatment and anti-inflammatory steroids[8], which is why the mini-BASDAI index did not show superiority in the assessment of disease activity in patients without peripheral manifestations of ankylosing spondylitis.

This fact is also revealed by our study, despite the limitations of research through the fact that our study was cross-sectional and on a relatively small group of patients (N =124) in comparison to other studies.

Conclusions

In conclusion, both BASDAI and mini-BASDAI correlated with the markers of disease activity in patients with ankylosing spondylitis, especially with ESR, CRP, ASDAS-CRP, and the Schober index. However, mini-BASDAI did not show a better correlation in patients without peripheral manifestations compared to those with peripheral manifestations. This demonstrates once again that mini-BASDAI is not superior to the BASDAI index in evaluating patients with AS without peripheral manifestations[7, 10], but mini-BASDAI has shown a better correlation in addition to BASDAI with the indices of flexion of the cervico-dorsal spine, thus superior in assessing mobility in patients with ankylosing spondylitis.

Bibliography

1. Zochling J; Heijde D; Burgos-Vargas R; et al. ASAS/EULAR recommendations for the management of ankylosing spondylitis. 2006, Annals of the Rheumatic Diseases, pp. (65)4: 442-452.
2. Sieper J; Braun J; Rudwaleit M. Ankylosing spondylitis: an overview. 2002, Annals of the Rheumatic Diseases, pp. 61:iii8-iii18.

INTERNAL MEDICINE

Original papers

3. Braun J; Sieper J. Inception cohorts for spondyloarthropathies .2000, Z Rheumatol, pp. 59:117-21.

4. Zink A; Braun J; Listing J; et al. Disability and handicap in rheumatoid arthritis and ankylosing spondylitis—results from the German rheumatological database. 2000, J Rheumatol, pp. 27:613-22.

5. Jimenez-Balderas FJ; Mintz G. Ankylosing spondylitis: clinical course in women and men.1993, J Rheumatol, pp. 20:2069-72.

6. Jenkinson TR; Mallorie PA; Whitelock H; et al. Defining spinal mobility in ankylosing spondylitis: the Bath Ankylosing Spondylitis Metrology Index. 1994. J Rheumatol 21:1694–1698

7. Hakkou J; Rostom S; Aissaoui N; et al. Comparison of the BASDAI and miniBASDAI in assessing disease activity in patients with ankylosing spondylitis. 2012. Clinical Rheumatology, pp. 31:441-445.

8. Song IH; Rudwaleit M; Listing J; et al. Comparison of the Bath Ankylosing Spondylitis Disease Activity Index and a modified version of the index in assessing disease activity in patients with ankylosing spondylitis without peripheral manifestations. 2009. Ann Rheum Dis. pp. 68(11):1701-1707.

9. Heuft-Dorenbosch L; Van Tubergen L; Spoorenberg A; et al. The influence of peripheral arthritis on disease activity in ankylosing spondyis patients as measured with the Bath Ankylosing Spondylitis Disease Activity Index. 2004. Arthritis and Rheumatism (Arthritis Care & Research), Vol. 51. pp. (2):154–159.

10. Garret S; Jenkinson T; Kennedy LG; et al. A new approach to defining disease status in Ankylosing Spondylitis: The Bath Ankylosing Spondylitis Disease Activity Index (BASDAI). 1994, Journal of Rheumatology, pp. vol 21, 2286-91.