Opportunities of Trabecular Bone Score to Evaluate Ankylosing Spondylitis Structural Progression in Young Male Patients

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Relevance

Ankylosing spondylitis (AS) is a chronic systemic inflammatory disease, with a primary lesion of the spine and sacroiliac joints characterized by simultaneously running processes of osteogenesis and osteoresorption. Dual-energy X-ray absorptiometry (DXA) is a specific method of evaluating bone properties, but bone mineral density (BMD) estimation in the lumbar spine is invalid in AS due to syndesmophytes. Trabecular bone score (TBS) is another tool to evaluate bone properties, but it is not associated with BMD. TBS, unlike BMD, does not lose its value in the presence of syndesmophytes and is able to adequately reflect the bone quality.

The Aim

To investigate TBS correlation with BMD, disease activity, sings of structural progression and treatment options of AS in males before 50.

Materials and Methods

Twenty one AS male patients before 50 who treated at our hospital during September 2019 to February 2020 are included in the investigation.

The inclusion criteria:

1) Verified diagnosis by modified New-York AS criteria 1984.
2) Age before 50 years.
3) Male sex.

The exclusion criteria:

1) Verified osteoporosis.
2) Usage of antiosteoporotic treatment therapy.

The following clinical parameters were collected: age; axial and peripheral clinical evaluation; association with psoriasis, uveitis or Crohn disease; duration of AS; BASDAI and ASDAS scores; consumption of corticosteroids and other treatments altering bone metabolism and alcohol; smoking status. Erythrocyte sedimentation rate (ESR) was performed using the Westergreen method. C-reactive protein (CRP) and fibrinogen were also evaluated as inflammatory markers. The structural progression of AS was determined by the sacroiliitis Kellgren stage. BMD was measured in the lumbar spine, right and left femurs and femoral necks. TBS in the lumbar spine was determined using an iNsight software package. The relationships between TBS, Kellgren sacroiliitis stage, BMD indices in different parts of the skeleton, clinical and laboratory parameters were studied using Spearman correlation analysis.

Results

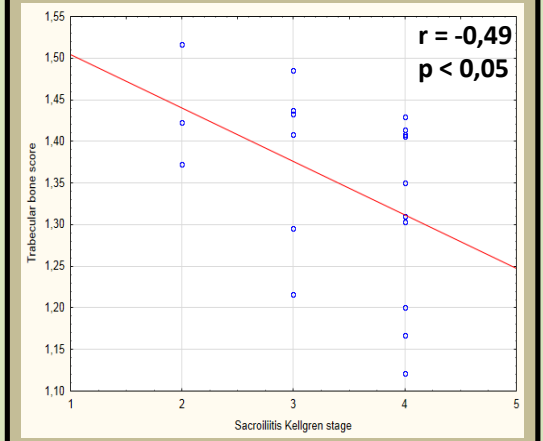
A negative correlation was revealed between the stage of sacroiliitis and TBS values ($r = -0.49$; $p < 0.05$). Moreover, there was no correlation between the stage of sacroiliitis and BMD at any of the measured points of the skeleton. There were no differences in TBS between various treatment groups. There was also no correlation between either TBS or stage of sacroiliitis and any clinical characteristic.

Patient's characterictics

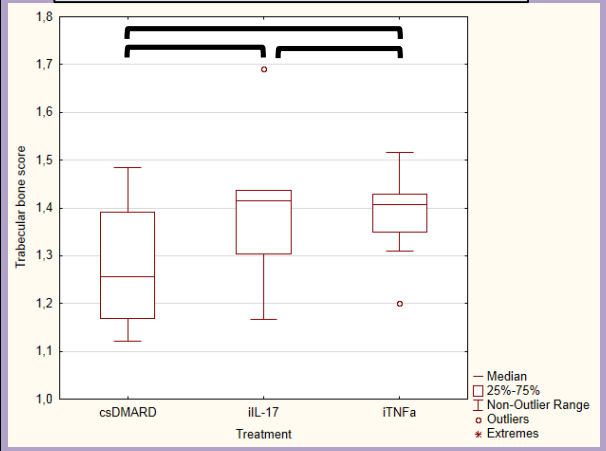
Variable	Me ± SD
Age, ys	36,0 ± 6,7
Disease duration, ys	13,0 ± 6,1
ESR, mm/h	12,0 ± 17,6
CRP, mg/L	6,8 ± 26,7
Fibrinogen, g/L	4,157 ± 1,320
BASDAI	2,3 ± 1,9
ASDAS	2,04 ± 0,93
BMD, g/cm^2	1,184 ± 0,136
BMD, g/cm^2	1,005 ± 0,126
BMD, g/cm^2	0,957 ± 0,131
BMD, g/cm^2	1,012 ± 0,127
BMD, g/cm^2	0,979 ± 0,152
TBS, g/cm^2	1,407 ± 0,131

Variable		n
Total patient number		21
Kellgren sacroiliitis stage	2	4
	3	7
	4	10
Treatment option	csDMARD	4
	iTNFa	11
	iIL-17	6

Correlation between TBS and sacroiliitis stage



TBS difference by treatment option



csDMARD – conventional synthetic disease-modifying anti-rheumatic drugs;
iIL-17 – inhibitors of interleukin-17;
iTNFa – inhibitors of tumor necrosis factor-alpha