TRABECULAR BONE SCORE IN PATIENTS WITH INFLAMMATORY BOWEL DISEASES

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INTRODUCTION

Osteoporosis is known chronic complication of inflammatory bowel diseases (IBD). It is known that areal bone mineral density (aBMD) does not sufficiently reflect bone strength and quality. The trabecular bone score (TBS) provides an indirect measurement of bone microarchitecture, independent of aBMD.

AIMS

The aim was to assess TBS in IBD patients with regard to disease behavior using in comparison with lumbar spine (LS) BMD.

METHODS

The cohort consisted of 84 IBD patients, 53 with Crohn's disease (CD) and 31 with ulcerative colitis (UC). Clinical characteristics i.e. age, gender, anthropometry, clinical behaviour, medication were recorded. The BMD was determined by dual-energy X-ray absorptiometry (DXA, Hologic Discovery) at the lumbar spine. TBS was determined by TBS Insight® software (Medimaps, France). The clinical characteristics of the cohort are shown in table 1.

Table 1. Clinical characteristics of the cohort

Clinical characteristics	Cohort (n=84)	UC (n=31)	CD (n=53)
Male/ Female (%)	39/45 (46/54%)	13/18 (42/58%)	26/27 (49/51%)
Average age (median, range) /yrs/	42±14 (19-78)	47±16 (22-78)	39±11 (19-75)
Menopause (% female)	12 (14%)	9 (29%)	3 (6%)
Age at the diagnosis /yrs/	31±14	35±16	28±10
≤ 16 (%)	8(10%)	2 (6%)	6 (11%)
17- 40 (%)	56(67%)	16 (52%)	40(75%)
≥41 (%)	19(23%)	13 (42%)	6 (11%)
Duration of the disease (median, range) /yrs/	11±7 (1-44)	11±7 (3-44)	11 ± 7 (1-38)
Localisation of the disease			
	-	E1 = 3 (10%)	L1 = 21 (40%)
	-	E2 = 18 (58%)	L2 = 21 (40%)
	-	E3 = 10 (32%)	L3 = 9 (17%)
	-	-	L4 = 2 (3%)
Clinical behavior of CD			
B1	-	-	14 (27%)
B2	-	-	15 (28%)
B3	-	-	24 (45%)
IBD surgery	22 (26%)	1 (3%)	21 (40%)
Medication			
5-ASA (%)	35 (42%)	17 (55%)	18 (34%)
Corticosteroids (%)	8 (10%)	5 (16%)	3 (6%)
Azathioprine (%)	31 (37%)	12 (39%)	19 (36%)
Anti-TNF (%)	32 (38%)	9 (29%)	23 (43%)
Vitamin D and calcium supplementation (%)	22 (26%)	9 (29%)	13 (25%)

RESULTS 1.

The mean BMD in lumbar spine was 0.964±0.113 g/cm^2 and in total femur 0.909±0.139 g/cm^2. The mean T score was -0.85±1,18 in lumbar spine and -0.45±0.98 in total femur. The mean TBS score was 1.356±0.141, in subgroup of CD patients 1.4±0.122 and UC patients 1.341±0.17. The prevalence of osteopenia (T score between -1 to -2,5) in our cohort was found in 39/84 (46.4%) patients and osteoporosis in 6/84 (7.2%) patients. In a subgroup of UC patients was osteopenia present in u 16/31 (51.6%) and osteoporosis in 1/31 (3.2%) patients. In a subgroup of CD patients was osteopenia present in 23/53 (43.4%) and osteoporosis in 5/53 (9.4%) patients.

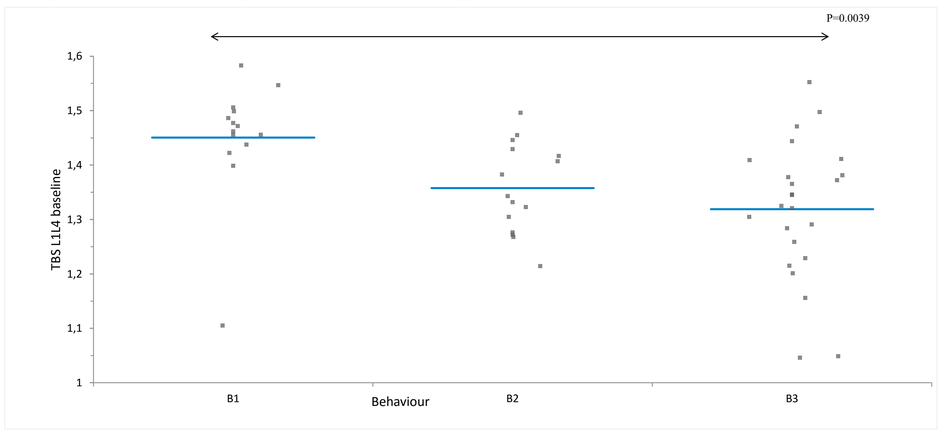
Table 2. DXA parameters of the cohort

DXA parameters	Cohort (n=84)	UC (n=31)	CD (n=53)
Normal (%)	39 (46.4%)	14 (45.2%)	25 (47.2%)
Osteopenia (%)	39 (46.4%)	16 (51.6%)	23 (43.4%)
Osteoporosis (%)	6 (7.2%)	1 (3.2%)	5 (9.4%)
L1-L4 spine			
T score ± SD	-0.85±1.18	-0.78±1.17	-0.9±1.096
Z score ± SD	-0.58±1.24	-0.34±1.44	-0.7±1.1
BMD L (g/cm^2)	0.964±0.113	0.972±0.132	1.0±0.12
Femur total			
T score ± SD	-0.45±0.98	-0.413±1.09	-0.5±0.920
Z score ± SD	-0.3±1.0	-0.117±1.08	-0.4±0.953
BMD F (g/cm^2)	0.909±0.139	0.887±0.146	0.923±0.134
TBS	1.356±0.141	1.341±0.17	1.4±0.122

RESULTS 2.

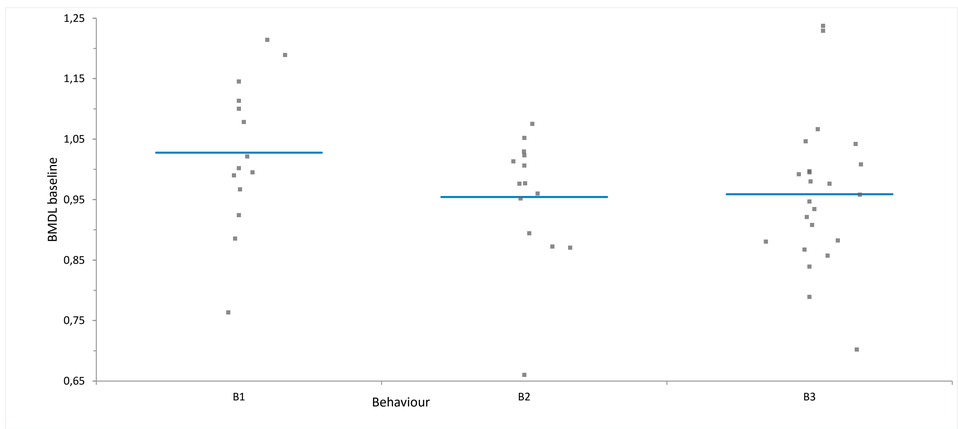
Significantly lower TBS although not LS BMD was found in patients with fistulising CD as compared to those with luminal disease, 1.32±0.13 and 1.45±0.11 respectively (p=0.0039). We did not observe any difference in TBS or BMD in UC patients according to the disease behaviour.

Fig 1. TBS in CD patients according to disease behaviour



TBS= Trabecular bone score, B1-luminal disease, B2 –stricturing disease, B3-fistulasing disease

Fig 2. BMD in lumbar spine in CD patients according to disease behaviour



BMD= Bone mineral density , B1-luminal disease, B2 –stricturing disease, B3-fistulasing disease

CONCLUSION

We observed low bone mineral density in 53.6% of IBD patients. There was a significantly lower TBS in CD patients with fistulasing disease, who are at higher risk of low bone mineral density, compared to those with luminal disease. We did not observe any significant difference in BMD L in these groups. According to these results we assume that spine TBS can identify quality of bone mineral density in patients with IBD better than BMD itself and the level of TBS degradation reflects severity of CD.

References: *Krajcovicova A et al: The prevalence and risk factors of low bone mineral density in a Slovak IBD cohort . JCC 2014; Kuzma M et al: Trabecular bone score change differs with regard to 25(OH)D levels in patients treated for adult-onset growth hormone deficiency. Endocr Pract 2016*