

Comparison of the response to bisphosphonate treatment between acute lymphoblastic leukaemia and osteogenesis imperfecta type I



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Background

Osteoporosis in children with osteogenesis imperfecta type 1 (OI) and acute lymphoblastic Leukaemia (ALL) is characterised by high bone turnover.

However the ability of spontaneous healing and reshaping of bone is retained in ALL even in the absence of bisphosphonate (BP) therapy, but impaired in OI.

Aims

To compare the first year response to BP therapy between children with ALL and OI.

Methods

Retrospective case note review of children with ALL and OI type 1 (2008-2013) managed at a single tertiary centre. Clinical data and dual energy X-ray absorptiometry (DXA) results including lateral vertebral assessment were collected at baseline and following first year of intravenous BP therapy

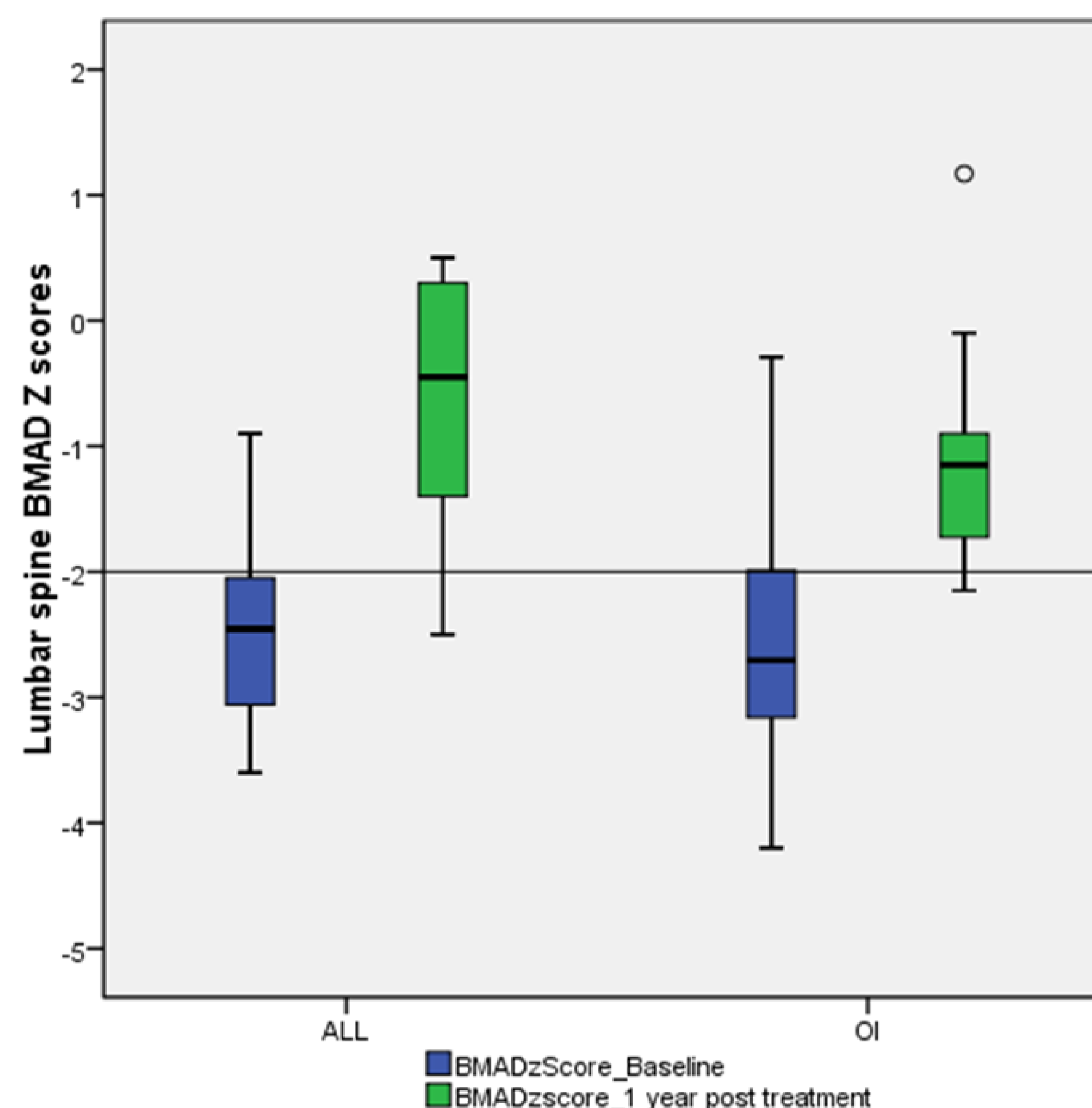
Data analysis was performed on IBM SPSS version 21. Mann Whitney U test (non parametric comparison of two independent group) and Wilcoxon signed rank test (non parametric, comparison of paired data within group) were performed.

Results

Baseline characteristics of the patients are as follows

Characteristics	ALL	OI type I	p value
Number of patients	10 (7 males)	12 (7 males)	
Zoledronate/Pamidronate	4/6	5/7	
Median age at start of treatment in years	9.65	10.27	0.86
Median height SDS	0.29	-1.38	0.001
Δ Height SDS (1 st year)	-0.28	0.045	0.49

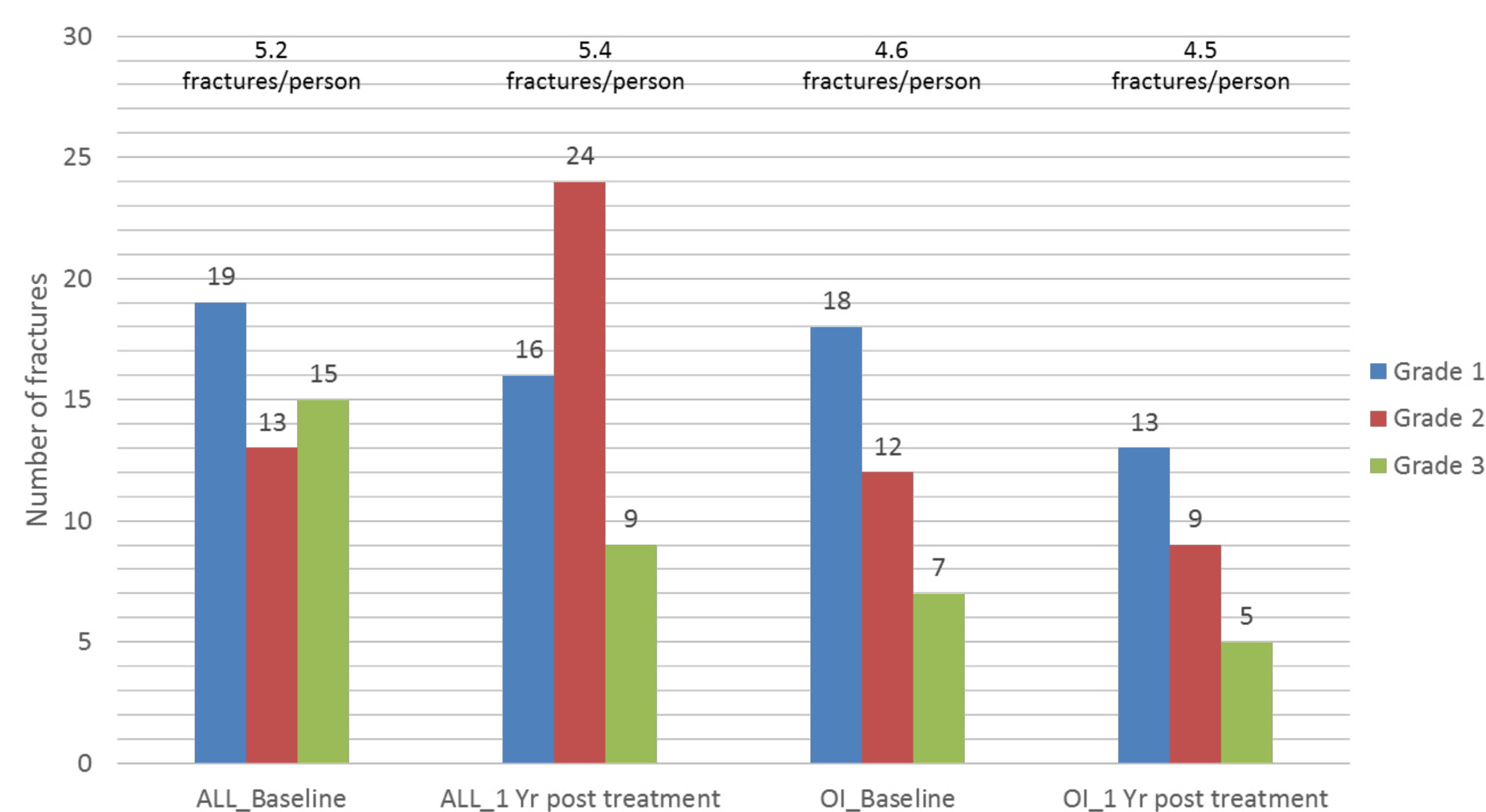
Comparison of Lumbar Bone Mineral Apparent Density (BMAD) Z scores



	LSBMAD SDS Baseline	LSBMAD SDS post BP	p value Within groups
ALL	-2.45 (-3.6 to -0.90)	-0.45 (-2.5 to -0.5)	0.001
OI type 1	-2.70 (-4.20 to -0.29)	-1.1 (-2.12 to 1.17)	0.003
ALL vs OI p value between groups	0.360	0.010	

LSBMAD SDS Lumbar spine bone mineral apparent density, SDS standard deviation scores, post BP= post 1 year bisphosphonate treatment, All values expressed as median (range)

Assessment of vertebral morphometry



Genant scores were used to semi quantitatively assess vertebral fractures. Grade 0= normal, Grade 1= 20-25% reduction in anterior (A), middle (M) or posterior (P) vertebral height, Grade 2= 25-40% height reduction, Grade 3= >40% height reduction

Conclusions

LSBMAD improvement following BP therapy, in ALL is comparable to that in children with type I OI. However, impact on vertebral remodelling was variable suggesting improvement in density precedes vertebral remodelling.

References

Genant et al, Vertebral fracture assessment using a semiquantitative technique. LSBMAD improvement in ALL is comparable to that in children with type I OI. Symptomatic improvement and vertebral remodelling variable

