Low bone mineral density in adolescents with joint hypermobility

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Abstract

Background: Generalized joint hypermobility is seems to be a risk factor for low bone density.

Objective: to determine the bone mineral density in adolescents with hypermobility syndrome.

Materials and Methods: bone mineral density (BMD) and bone mineral apparent density (BMAD) of 32 children, 13 to 18 years old with benign hypermobility syndrome were measured.

Results: Puberty had a significant delay in onset and peak height velocity in hypermobility group. Hypermobility group had significant lower BMAD (p=0.02). BMD and BMAD- z scores (p<0.005) compared to the control. Significant negative correlations were found between the Beighton scores and BMAD z-score (r=-0.30) in hypermobility children. Low bone mass was more frequently found among subjects with hypermobility (p=0.004). Hypermobility was found to increase the risk for low bone mass by 2.6 times (95% confidence interval 1.01-3.38).

Conclusion: **A**dolescents with joint hypermobility have lower bone mineral density when compared to the controls, and hypermobility increases the risk for low bone mass.

Background

Generalized joint hypermobility is quite common and seems to be a risk factor for low bone density.

Objective

The goal of this study was to determine the bone mineral density in adolescents with hypermobility syndrome.

Methods

In a cross-sectional study, we measured the bone mineral density (BMD) and bone mineral apparent density (BMAD) of 32 children, 13 to 18 years old with benign hypermobility syndrome diagnosed by Beighton score and 29 age- and sex-matched controls.

Age, stage of puberty, height, weight, and body mass index were evaluated and matched between the two groups. Bone age, gonadotropins, IGF-1, thyroid function test, sex steroids, serum vitamin D, and calcium intake were also assessed. None of the children were taking any drugs affecting bone metabolism or had any systemic disease.

Results and analysis

Bone mineral accretion in both groups occurred at a slowed and consistent pace, with a sharp increase during the pubertal growth spurt. Puberty had a significant delay in onset and peak height velocity in both boys and girls of the hypermobility group. Bone age and IGF-1 levels progressed more slowly in this group. Age at onset of puberty, independent of its length was a strong predictor of bone measurements at skeletal maturity. After correcting the onset of puberty and other interfering factors, the hypermobility group had still significant lower BMAD compared to the control (p=0.02).

BMD and BMAD- z scores were significantly lower in hypermobile children compared to the control group (p<0.005). Significant negative correlations were found between the Beighton scores and BMAD z-score (r=-0.30) in hypermobility children. Low bone mass was more frequently found among subjects with hypermobility (p=0.004). Hypermobility was found to increase the risk for low bone mass by 2.6 times (95% confidence interval 1.01-3.38).

Results and analysis

Table. Bone mineral values in the study groups

Group	Hypermobility Mean (SD)	Control Mean (SD)	*P* value
Whole body			
BMC	19.5 (3.1)	26.0 (3.0)	
BA	40.5 (3.0)	39.5 (3.0)	
BMD-Z score	-2.4 (1.1)	-1.3 (1.0)	0.002
BMAD-Z score	-1.9 (0.3)	-0.1 (0.1)	<0.005
Femoral neck			
BMC	25.2 (3.5)	33.0 (3.0)	
BA	5.1 (0.1)	5.0 (0.1)	
BMD-Z score	-2.9 (1.0)	-1.4 (0.9)	<0.001
BMAD-Z score	-0.1 (0.1)	0.3 (0.3)	0.01

Discussion/Conclusion

These findings suggest that adolescents with joint hypermobility have lower bone mineral density when compared to the controls, and hypermobility increases the risk for low bone mass.

Key words

hypermobility, BMD, BMAD

References

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