Os et APLV

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Ostéoporose de l' enfant

- Définition
  - Osteopenie: réduction masse minérale osseuse
  - Osteoporose: raréfaction et altération architecture osseuse
- DEXA (absortiometrie biphonique aux rayons X):corrélée chez l enfant croissance du squelette, donc sexe âge stade pubertaire
- Ostéoporose Z score -2 DS
- Traduction: fracture, tassements vertébraux

FR ostéoporoses 2ndaires

- Carence calcium
- Carence Vit D
- Apports protéiques et énergétiques insuffisants
- Immobilisation
- Inflammation
- corticothérapie

Pourquoi se poser la question?

* Allergie alimentaire et jeunes enfants
* Poly- allergie avec répercussion sur la croissance et sur âge ou formation osseuse la plus importante
* Association asthme, et corticothérapie
* 95%du capital osseux de fin de croissance est accumulée a tous les sites a l âge de 20 ans.
* Augmentation des apports calciques pendant enfance associés meilleur gain de masse osseuse et un pic de masse osseuse plus élevée

Constats/ Biblio

- En pratique courante ostéoporose et APLV=0
  - Ou plutôt 1 enfant mais plusieurs facteurs de risques
- Nouveau recrutement= régime mère et ostéoporose du nourrisson
- « fausse » APLV et Consommation large laits végétaux

Pediatr Allergy Immunol. 2018 Aug 11.

Risk factors for reduced bone mineral density measurements in milk-allergic patients.

Goldberg MR[1], Nachshon L[1], Sinai T[2], Epstein-Rigbi N[1], Oren Y[1], Eisenberg E[3], Katz Y[1,4], Elizur A[1,4].

Author information

Abstract

BACKGROUND:

Earlier studies noted that young adults with IgE-mediated cow's milk allergy (IgE-CMA) have significantly lower bone mineral density (BMD) than age- and gender-matched controls. We sought to identify additional risk factors contributing to the low BMD in IgE-CMA patients.

METHODS:

Postpubertal (defined by Tanner stage V) IgE-CMA patients (n = 78; 16- to 30-year-old females and 17.5- to 30-year-old males) were evaluated prospectively for BMD using a DXA scan, serum values of bone turnover factor, and dietary and lifestyle questionnaires. Patients receiving > 2 short courses of systemic steroid treatments were excluded.

RESULTS:

Abnormal BMD measurements (T- or Z-scores < -1.0) of the lumbar vertebrae, femoral neck, or hip were noted in 60 patients, while normal BMD values were present in 18 patients, despite similarly decreased calcium intakes between the groups (P = 0.92). Patients with abnormal BMD were more likely to be asthmatic (P = 0.014), have a lower weight z-score (P = 0.007), have a decreased percent caloric intake derived from fat (P = 0.01), and have an increased carbohydrate intake (P = 0.03), in comparison with the normal-BMD group. Serum values of bone turnover were similar between the groups. On multivariate regression analysis, only asthma significantly (P = 0.006) increased the risk for osteopenia and osteoporosis (OR 38.5, 95% CI 2.8-500). Fitting continuous z-scores into a regression model, both asthma and weight z-score were significant (adjusted r^2 = 0.272). Asthma was significantly overrepresented in osteopenic and osteoporotic subpopulations while decreased weight only in patients with osteoporosis.

CONCLUSIONS:

In the context of a low calcium intake, asthma and weight are independent risk factors for decreased BMD in IgE-CMA patients.

J Pediatr Endocrinol Metab. 2017 Feb 1;30(2):133-139. doi: 10.1515/jpem-2016-0162.

Bone health assessment of food allergic children on restrictive diets: a practical guide.

Doulgeraki AE, Manousakis EM, Papadopoulos NG.

Abstract

BACKGROUND:

Food allergy in childhood is on the rise globally and is managed with avoidance diets; recent case reports of food allergic children with nutritional rickets in the literature highlight **the importance of close monitoring of bone health in this population.**

METHODS:

There is no consensus as yet with regard to bone health evaluation in food allergic children; therefore, extensive literature search was performed and the existing evidence is presented, along with a relevant algorithm.

RESULTS:

Children allergic to cow's milk protein or presenting with allergy in more than three food items, as well as patients with severe allergic phenotypes or comorbidities known to affect the skeleton, seem to be at risk of metabolic bone disorders. As a practical guide, suspicious cases can be investigated with basic bone profile, whereas more severe cases (persistent bone pain and fractures) may undergo advanced bone health assessment, with bone mineral density (BMD) and metabolic bone markers' evaluation. Of note, these diagnostic steps call for further studies in the field of food allergy, as they are not performed as a routine. Evidence is accumulating with regard to vitamin D deficiency, osteopenia and imbalanced bone metabolism in those food allergic children who show poor dietary compliance or have inadequate medical supervision.

CONCLUSIONS:

Ensuring optimal bone accrual in a food allergic child is an important task for the clinician and requires close monitoring of the restrictive diet and prompt therapeutic intervention, in an effort to avoid rickets or osteopenia.

Format: Abstract
Send to

J Pediatr Gastroenterol Nutr. 2000 Mar;30(3):310-3.

Risk of inadequate bone mineralization in diseases involving long-term suppression of dairy products.

Infante D[1], Tormo R.
Author information

Abstract

BACKGROUND:

Eighty percent of peak bone mass should be achieved from birth through adolescence. An adequate calcium intake is essential, and it is advisable that 60% of the recommended calcium allowance be dairy calcium. This study was conducted to examine bone mineral content (BMC) in patients with diseases that usually involve long-term suppression of dairy products.

METHODS:

Thirty patients, aged 2 to 14 years (mean, 7 years), **10 with late-onset, genetically induced lactose intolerance, 7 with cow's milk protein allergy,** 3 with short-bowel syndrome, and 10 with hypercholesterolemia were involved in the study. They were receiving various dietary regimens for periods longer than 2 years: 14 patients received special formulas for children (lactose-free cow's milk formula, highly hydrolyzed cow's milk protein formula, soy protein isolate formula), 4 patients received liquid soy beverages, 6 patients received skim milk(1% fat), and 6 patients had exclusion of dairy products. Bone mineral density (BMD) was assessed by dual-energy x-ray absorptiometry.

RESULTS:

Nine patients had osteoporosis, 6 had osteopenia, and 15 had results within normal ranges. Overall, the group had a standard deviation score of -1.3 (osteopenia). **The statistical correlation between the BMD value and the percentage intake of recommended daily allowance (RDA) of dairy (or substitute) calcium (in milligrams per day) was highly significant ($P < 0.0001$, $r = 0.89$).**

CONCLUSIONS:

All patients with diseases involving total or partial withdrawal from milk products for a prolonged period are a group at potential risk of defective bone mineralization and should be monitored through BMD assessment.

The evaluation of selected parameters of calcium and phosphorus metabolism i n children with cow's milk allergy].

[Article in Polish]

Rowicka G[1], Ambroszkiewicz J, Strucińska M, Dyląg H, Gołębiowska-Wawrzyniak M.

Author information

Abstract

THE AIM of this study was to evaluate selected parameters of calcium and phosphorus metabolism in children with CMA treated with the following milk substitute formulas: lactose-containing extensively hydrolyzed wheat protein formula, lactose-free extensively hydrolyzed casein protein formula, as well as soy-based formula.

MATERIAL AND METHODS:

The study involved 66 children with CMA aged 2-5 years treated with milk-free diet for at least one year. Group I included 31 children fed with a lactose-containing formula, group II - 35 children treated with lactose-free formula. In all children the mean energy intake and nutritional value of daily food rations were assessed. Serum concentrations of calcium (Ca), phosphorus (P), sodium (Na) and magnesium (Mg) were determined using standard methods. Serum values of 25 hydroxyvitamin D (25-OH D) and parathormone (PTH) were assessed by chemiluminescence, whereas concentrations of biochemical markers of bone formation-bone alkaline phosphatase (BALP), osteocalcin (OC) and bone resorption marker-collagen type I crosslinked C-telopeptide (CTX) were determined by immunoenzymatic methods (ELISA), using specific monoclonal antibodies.

RESULTS:

There were no significant differences in the mean dietary supply of calcium, phosphorus, magnesium, sodium, total protein and vitamin C in children from both groups. In the diets of children from group II, the mean content of lactose (0.5±1.0 vs 10.0±6.8 g/d) and 25-OH vitamin D (4.1±2.3 vs 8.5±4.0 ug/d) were significantly lower and dietary fibre content (14.7±3.9 vs 10.4±3.9 g/d) was higher. Calcium and vitamin D dietary supply was lower with respect to nutritional recommendations in all the studied children, whereas the dietary deficiency of vitamin D was higher in children from group II. The mean serum concentrations of evaluated biochemical parameters did not reveal any differences in children from the study groups and were in the normal ranges. There were also no differences in the mean serum concentration of 25-OH vitamin D, ALP, BALP, CTX and PTH in patients from both groups. The mean concentration of OC was significantly higher in group II (71±26.6 ng/ml) than in children from group I (61.1±23.4 ng/ml) <0.01. Positive correlation was found between OC and CTX in both study groups.

CONCLUSIONS:

1. In children with CMA basic blood laboratory tests may have limited importance in the evaluation of calcium and phosphorus metabolism. 2. Our results suggest that the disturbances in the balance between bone formation and bone resorption processes may occur in children with CMA treated with lactose-free formulas. 3. In order to assure optimal conditions for achieving adequate bone mass by children with CMA, it is necessary to provide them with regular medical and nutritional care.

Indian Pediatr. 2013 Jul;50(7):706.

Bone metabolism in cow milk allergic children.

Jakusova L[1], Jesenak M, Schudichova J, Banovcin P.

Author information

Abstract

Children with cow milk allergy are suspected to develop calcium metabolism disturbances. We observed increased markers of bone turnover in these children. Children with cow milk allergy are more prone to develop the disturbances of the bone mineralization even in the first year of life.

Our studied group consisted of 25 CMA children (aged 8±4.2 months) and 65 healthy controls (4± 2.8 months). CMA was confirmed by standardized open oral food challenge [2]. Enrolled children were fed with extensively hydrolyzed or amino acid formulas

In the control group of healthy children, all the examined parameters were within physiological ranges. Conversely, cow milk-allergic children showed lower serum and **urine concentration of calcium** (serum: 2.06±0.06 vs. 2.26±0.03 mmol/L, P=0.008; urine: 0.36±0.30 vs. 1.51±0.68 mmol/kg/day, P=0.008). Alkaline phosphatase (ALP) and its bone isoform (BALP), the two markers of increased bone turnover, were significantly increased in children with CMA (ALP: 9.07±0.59 μkat/L vs. 4.04±0.42 μkat/L, P=0.008; BALP: 87.67±3.88% of total serum ALP vs. 61.80±11.73% of total serum ALP, P <0.001)

Med Wieku Rozwoj. 2013 Jul-Sep;17(3):246-52.

Serum concentrations of sclerostin and bone turnover markers in children with cow's milk allergy.

Ambroszkiewicz J[1], Rowicka G, Chełchowska M, Gajewska J, Strucińska M, Laskowska-Klita T.

Author information

Abstract

THE AIM:

of this study was to assess concentrations of sclerostin and biochemical markers of bone metabolism in children with cow's milk allergy.

MATERIAL AND METHODS:

The study included 45 children (age range 2-6 years) with diagnosed cow`s milk allergy, who were on a dairy-free diet and under systematic medical and dietary control at the Institute of Mother and Child in Warsaw. The control group consisted of 40 healthy children (2-6 years), who did not have any symptoms of cow`s milk allergy nor any diseases influencing bone metabolism. Their diets included milk and dairy products. Dietary intake of macro- and micronutrients was assessed based on 3-day records using the Dietetyk2® nutritional program. In the serum samples, we measured concentrations of calcium, phosphate and total alkaline phosphatase by standard methods, 25-hydroxyvitamin D3 by chemiluminescence method and bone metabolism markers by immunoenzymatic methods. The Statistica (version 10.0) computer software was used for statistical analysis.

RESULTS:

The nutritional status of studied children based on BMI value was normal. In all patients, the average daily value of dietary energy and percentage of energy from protein, fat and carbohydrates were consistent with the recommended values. The intake of calcium in the diets of all children was deficient, however, the intake of vitamin D was consistent with recommendations in the children with allergy, while in the healthy children it was below the recommended values. Mean serum concentrations of calcium, phosphate, alkaline phosphatase, 25-hydroxyvitamin D3, osteocalcin and C-terminal telopeptide of type I collagen were similar in both studied groups. We observed significantly lower sclerostin levels in children with cow`s milk allergy (0.295±0.116 ng/ml) than in the healthy children (0.353±0.126 ng/ml) ($p<0.05$). The ratio of cytokines RANKL/OPG (receptor activator of nuclear factor κB ligand/osteoprotegerin) was significantly higher in children with allergy compared with their healthy counterparts ($p<0.05$).

CONCLUSIONS:

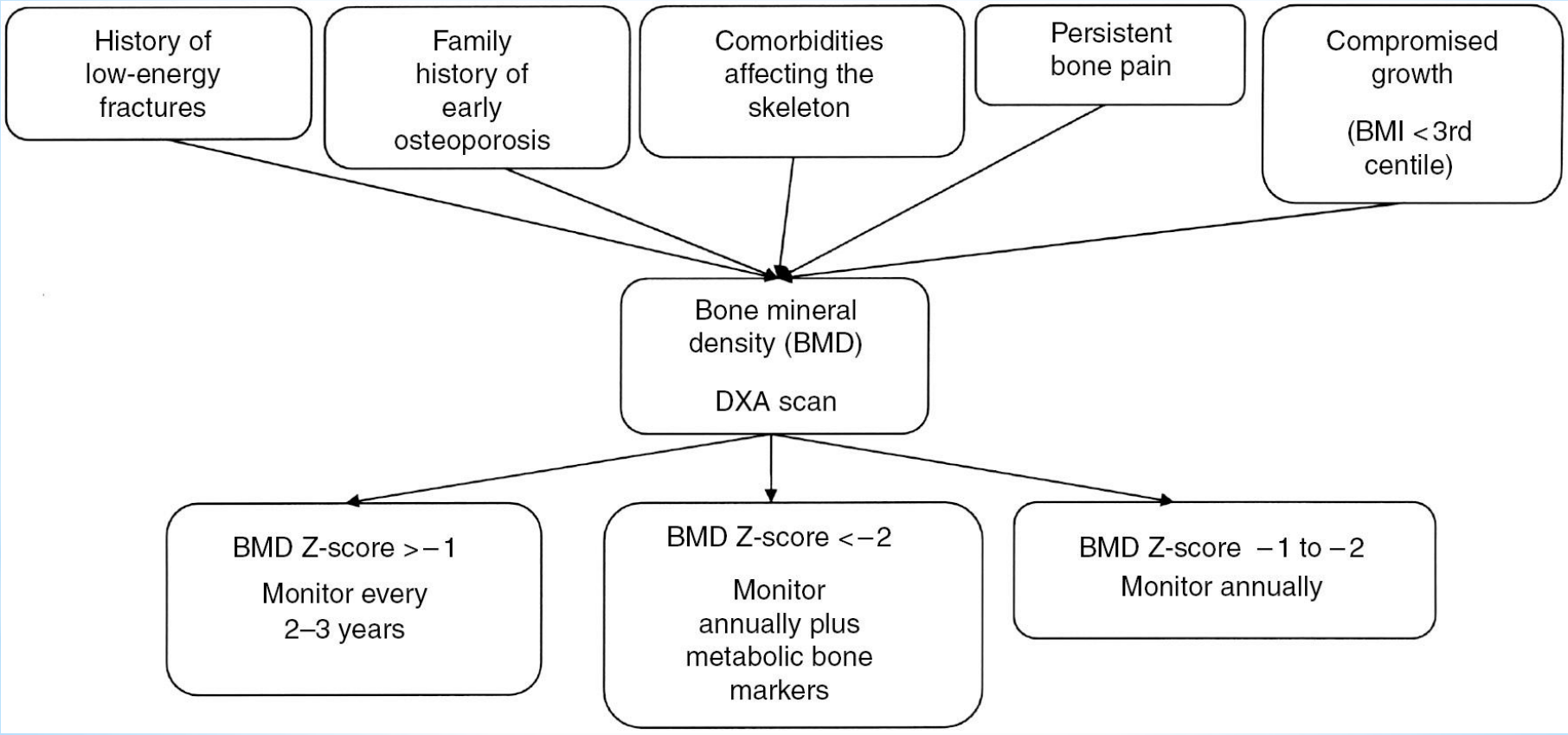
Basic laboratory parameters related to bone turnover in children with cow`s milk allergy, who were under medical and nutritional care, were normal**. Reduced levels of sclerostin and increased ratio of cytokines RANKL/OPG may suggest disturbances in the balance between bone formation and bone resorption in these patients. Further research is needed on bone metabolism in children with food allergy, who due to the use an elimination diet may be at risk of developing abnormalities in the skeletal system**.

Vitamine D et atopie

According to research data, patients with moderate to severe atopic dermatitis are more prone to vitamin D deficiency, both because of sun exposure avoidance and because of the presence of chronic inflammation.

Wawro N, Heinrich J, Thiering E, Kratzsch J, Schaaf B, et al. Serum 25(OH)D concentrations and atopic diseases at age 10: results from the GINIplus and LISAplus birth cohort studies. BMC Pediatrics 2014;14:286.

*Explorations?



Advanced bone profile of children with food allergy on a special diet and predisposing factors for low-energy fracture.

Bone health assessment of food allergic children on restrictive diets: a practical guideArtemis E. Doulgeraki / Emmanouel M. Manousakis / Nikolaos G. 2017-01-18

*Explorations?

Formation	Résorption
Sérum	**Plasma/sérum**
ostéocalcine*	Phosphatase acide résistante à l'acide tartrique
Phosphatase alcaline totale	Pyridinoline et desoxypyridinoline libres
Phosphatase alcaline osseuse*	Télopeptides C-terminaux (CTX) du collagène de type I (ex ß-CrossLaps) *
Propeptides C et N-terminaux du collagène de type I (PICP et PINP*)	
	Urine
	Pyridoline et désoxypyridoline libres* Télopeptides N (NTX) *et C terminaux (CTX) *du collagène Calciurie Hydroxyprolinurie Galactosylhydroxylysine

Calciurie

- Calciurie marqueur de résorption osseuse
- Mesure calciurie des 24h
- Dépistage: ca/créat sur une miction (urine du matin)
- Implique 3 organes: rein intestin squelette
- Régulation complexe: calcémie/ Ca SR situe hanse de Henle/ PTH/ acidose métabolique

Calciurie

- Hypercalciurie et risque de néphrocalcinose et lithiase rénale:
  - Calciurie des 24h:élevée si sup 4mg/kg/24h, pathologique si 6mg/kg/24h
  - Ca/creat: sup a 0,7 mmol/mmol ou 0,2mg/mg

- HypoCalciurie:
  - Insuffisance rénale, • Défaut d'apports alimentaires, • Déficit en vitamine D, malabsorption
  - A interpréter en fonction de l'alimentation et de la détermination plasmatique.

HypoCalciurie

- On redoute hyper calciurie mais quant est il de l’ hypocalciurie?
- Hypocalciurie : • Valeur ca/creat sur une miction varie en fonction de l age:
- valeur retenue 0,3 mmol/mmol

En pratique

- Evaluation apport calcique+++
- Supplémentation vit D, discussion dosage
- Eliminer autres facteurs de risque
- Ca/créat sur une miction
- Pas DEXA en routine sauf si fracture, facteurs risque…
- Discuter coupler DEXA et EOS corps entier rachis face et profil pour rechercher tassement

Merci de votre attention