Cerebrospinal Fluid Research

BioMed Central

Poster presentation

Open Access

Biochemical markers of bone metabolism in patients with Myelomeningocele

E Pagés*, J Sánchez, G Romero, J Iborra, S Rodríguez and A Cuxart

Address: Spina Bifida Unit. Vall d'Hebron Hospital. P. Vall d'Hebron 119-129. 08035 Barcelona. Spain

Email: E Pagés* - 25095opb@comb.es

* Corresponding author

from 49th Annual Meeting of the Society for Research into Hydrocephalus and Spina Bifida
Barcelona, Spain, 29 June – 2 July 2005

Published: 30 December 2005

Cerebrospinal Fluid Research 2005, **2**(Suppl 1):S51 doi:10.1186/1743-8454-2-S1-S51

Background

Biochemical markers of bone turnover provide a means of evaluating skeletal dynamics that complements static measurements of bone mineral density (BMD). This study was designed to examine biochemical markers of bone metabolism in myelomeningocele (MMC) patients.

Patients and methods

Eighty patients with myelomeningocele were randomly chosen from a roster of >500 patients with myelomeningocele followed at a multidisciplinary spina bifida unit in a public tertiary university hospital. Patients with known metabolic acidosis, renal insufficiency, or other metabolic bone disease (i.e., hyperparathyroidism) were excluded. The methods used in the study were clinical interview and examination, measurement of total-body bone mineral density (BMD) with subregional values and estimation of biochemical markers of bone turnover (formation: osteocalcin, bone specific alkaline phosphatase (BSAP); resorption: urinary deoxypyridinolines, type I collagen cross *linked* N-telopeptide (NTx)) and the main parameters of calcium phosphate metabolism in blood and/or urine. To study relationships among the variables, the Chi-squared, ANOVA and lineal regression tests were applied.

Results

The formation bone markers were into the normal values while the resorption bone markers were higher than normal values. The bivariate analysis showed statistically significant relationships between bone mineral markers and age, body mass index, hip flexion contractures, intake of calcium, and abnormalities in menstrual period. Bone resorption markers were related with pelvis BMD. Bone formation markers were related with trunk, spine and total body BMD. PTH was related with trunk and total body BMD. The multivariate approach demonstrated that BSAP levels were determinate by body mass index ($p = 0.002$), urinary deoxypyridinolines ($p = 0.002$) and neurological level ($p = 0.013$). Osteocalcine levels were determinate by calcium intake ($p = 0.001$) and sex ($p = 0.008$). Urinary deoxypyridolines levels were determinate by urea ($p = 0.001$) and hip flexion contractures ($p = 0.009$). Finally, NTx levels were determinate by calcium intake ($p = 0.001$).

Conclusion

Biochemical markers of bone mineral metabolism in myelomeningocele could be a good tool to evaluate the bone metabolism although it is necessary have a prolonged follow-up in order to conclude their real value in the current practice.