BACKGROUND

About 85-90% of children born small for gestational age (SGA) experience a catch-up growth that occurs mostly during the first year of life and results in a full stature recovery by the age of 2. The remaining 10-15% do not undergo compensatory growth, achieving - if untreated - an adult height approximately 20 cm below their peers.

OBJECTIVE

The aim of this prospective one-center study was to investigate the relation between bone maturation (BM) and catch-up growth during the first year of life in SGA infants.

METHODS

Newborns whose weight and/or length was <2 SD for gestational age were classified as SGA. The study included a group of 32 SGA, 21 of which full-term (37-41 gestation weeks GW, subgroup A1) and 11 preterm (30-36 GW, subgroup A2). Control group (B) consisted of 19 full-term and adequate for gestational age (AGA) newborns. All the partecipants were born in the same hospital and period (2013-2014). Chromosomalar disorders, major congenital defects and maternal chronic diseases were criteria of exclusion. The study population underwent longitudinal evaluation of growth parameters and BM at 6, 12 and 18 months. Assessment of BM was performed by ultrasonography (US) study of Beclard’s nucleus (<3 mm at birth meaning intrauterine delay of BM).

RESULTS

- Mean 1st year height velocity (HV) was 25.5±13.2 cm.
- Significantly higher HV was observed in subgroup A2 versus A1 (32.4±8.0 vs 25.6±2.9 cm, p=0.01); nevertheless, subgroup A2 presented more frequently <2 SD height outcome at 1 year than subgroup A1 (27.3% vs 0%, p=0.01).
- If compared with controls, HV was overall higher in SGA group, but without reaching statistical significance (28.6±6.5 vs 25.5±2.9 cm, p=0.10).
- Intrauterine delay of BM was more common in group A vs B (59.4% vs 21.2%, p=0.0078), and in subgroup A2 vs A1 (90.9% vs 42.9%, p=0.0086). SGA with intrauterine delay of BM showed a constant pattern of catch-up growth, with higher HV and better height gain (29.75±3.1 vs 23.8±2.7 cm, p=0.003) at 12 months evaluation.

CONCLUSION

- Our results suggest for the first time that neonatal BM should be regarded as a predictive factor of SGA height gain during the first year of life.
- US evaluation of Beclard’s nucleus is a useful non-invasive technique to identify intrauterine delay of BM, which can positively influence early postnatal catch-up growth of SGA infants.