

Normocalcaemia during neridronate treatment of newborn infant with osteogenesis imperfecta

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Introduction

Osteogenesis imperfecta (OI) (McKusick 259420) type IV is a dominantly inherited disorder characterized by normal or greyish sclerae, mild to moderate deformity and variable stature. Some infants have fractures and deformity at birth while others have only mild to moderate femoral bowing (1). Recently, cyclical intravenous treatment with bisphosphonates has proven of benefit to adults and children with OI (2-5).

A 2-day-old male infant was admitted because of humeral fracture. He was born at term by spontaneous vaginal delivery after an uneventful pregnancy as the second child of unrelated parents. The father and the brother are affected by OI type IV. On admission, the infant had body length of 50 cm (50th centile), body weight 3080 g (50th centile). A skeletal series showed multiple healing of bilateral ribs and right clavicola, acute fracture of right humeral and deformed long bones. Hypertelorism, wormian bones on the skull films and generalized osteopenia were noted (Figure 1A). Routinary laboratory data showed normal values including serum calcium, phosphate and alkaline phosphatase. He was breast fed but ate poorly and cried irritably. Daily vitamin D 400 UI/day was prescribed. Over the next few days fractures of femur bilaterally, left humeral and right radius occurred. Protective splints for the extremities to stabilize the fracture have been performed and foam pads and gel cushions were used to reduce the risk of new fractures.

On the 18th day of recovery a morphine analogous Fentanyl at 1 µg/kg/h ev was used for pain without clinical improvement. Cyclic neridronate infusion 1 mg/kg for two consecutive days was started from when he was 20 days old and every 3 months thereafter. Serum calcium and urine calcium/creatinine have been monitored before and daily for one week after the first two infusions showing always normal values. His feeding and



Figure 1 - Anteroposterior radiographs of lower limbs (A) before and (B) after neridronate treatment in an infant with osteogenesis imperfecta.

activity improved gradually after the first infusion. At present he is 14 months old with age-appropriate growth and good psychomotor development. No additional fractures occurred after the first infusion. Radiography of lower limbs showed lessened deformities and improvement in osteopenia (Figure 1B).

Dual-energy X ray absorptiometry (DEXA) Hologic QRR-4500 A) revealed lumbar spine bone mineral density (BMD L2-L4) of 0.229 g/cm² and bone mineral content (BMC L2-L4) of 0.63 g before treatment and of 0.311 g/cm² and 3.96 g respectively after fourth infusion.

Bisphosphonate treatment has been used with beneficial effect in a newborn infant by Chien et al. (6). The Author treated with cyclic pamidronate a 14 day old infant affected by severe OI who presented a generalized seizure 5 days after the first infusion associated with hypocalcaemia. Subclinical hypocalcaemia was noted after the second infusion. A mild drop in serum calcium from normal pre-treatment values, without associated clinical symptoms, has been also reported after pamidronate treatment in OI infants over two months of age (3).

Our case shows that treatment with neridronate does not seem to affect calcium balance even in the newborn period that is known "per se" to be at risk for hypocalcaemia.

Therefore neridronate can be considered a safety and effica-

cious drug also in newborn infants with severe OI, although it is still unclear at present how long the treatment should be continued.

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