

## Efficacy and safety of intravenous neridronate in pediatric bone loss associated to Crohn's disease: a case report

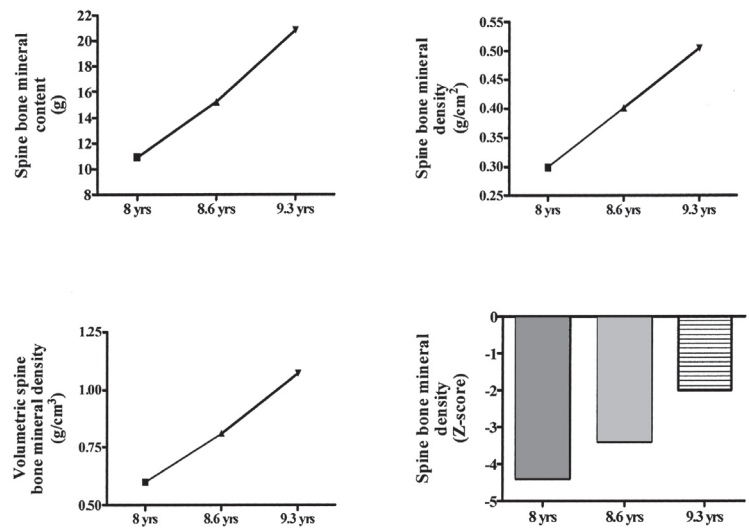
Sirs,

We read with interest your paper that reports the use of alendronate in improving corticosteroid-induced osteoporosis in children (1). Bone loss represents a frequent complication of long-term steroid therapy in children, notably in Inflammatory Bowel Disease (IBD) patients, who presented with bone loss in 22 to 70% of all cases (2, 3). In patients with gastrointestinal diseases, such as IBD or dyspepsia, reflux or other oesophageal disease often seen in long-term steroid treated patients, oral bisphosphonates should be carefully used (2, 3). Additionally, oral administration in patients with CD is at high risk of failure due to poor absorption of these drugs from the gut (3). Therefore intravenous bisphosphonates, efficacious and well tolerated in heterogeneous groups of pediatric patients with symptomatic osteoporosis (3-8), could also be valuable for IBD patients; their use, nevertheless, had not previously been reported in these patients. We would like to report a case of CD complicated by severe, symptomatic bone loss and treated with intravenous neridronate.

In May 2001, a 5-year-old girl was admitted to our hospital with severe acute abdominal pain and bloody diarrhoea. The history was positive for episodes of recurrent abdominal pain associated with non-bloody diarrhoea and failure to thrive. Physical examination revealed epigastric and mesogastric tenderness and reduced weight and height (<3 SD for age).

Biochemical evaluations showed: C-reactive protein 6.5 mg/dl (normal range: 0-0.5 mg/dl); ALT 65 IU/l (normal range: 1-49); AST 73 IU/l (normal range: 11-55),  $\gamma$ GT 55 IU/l (normal range: 0-39). Based on the persistent rectal bleeding, biochemical evaluations and clinical history, upper endoscopy and colonoscopy were performed. They revealed CD of the duodenum, terminal ileum and colon. She was therefore treated with salazopyrine and elementary diet via naso-gastric tube. The treatment also included daily calcium (1000 mg/day) and vitamin D (400 IU) supplements. This treatment induced a clinical remission. After the disease onset, the patient experienced three further episodes of relapsed CD and received short courses of steroids. At the age of 8, she started to complain of mild to moderate back pain. The patient was then submitted to a total spine radiograph that showed decreased bone density and reduction of height of the vertebral bodies. A bone densitometry by DXA of the lumbar spine (L1-L4) was therefore performed. All bone density values were calculated by

**Fig. 1.** Bone mineral assessment at the lumbar spine over 1.3 years of treatment.



Hologic software as: spine bone mineral content (g); spine bone mineral density (g/cm<sup>2</sup> and Z-score) and apparent volumetric spine bone mineral density (g/cm<sup>3</sup>).

Serum levels of calcium, phosphate, magnesium, alkaline phosphatase, parathyroid hormone were measured and resulted to be within the normal ranges. Byphosphonate treatment with neridronate (2 mg/kg body weight) was then added to calcium and vitamin D supplements.

Intravenous neridronate was started after the first DXA evaluation. Neridronate was used diluted in 250 ml of saline solution and infused intravenously in 30 minutes, carefully monitoring calcium serum level. After the first infusion, two further neridronate infusions were quarterly administered. Therefore, a total of three neridronate infusions were administered, which were well tolerated and were without side effects. Furthermore, so far, back pain has not re-appeared. After the third neridronate administration, a further total spine radiograph indicated an improved bone density and a recovered vertebral height. The results of the DXA evaluations are reported in Figure 1.

In conclusion, in patients with severe and symptomatic bone loss, intravenous bisphosphonate therapy may be considered a useful therapeutic option if oral treatment is contraindicated, as in IBD patients. Quarterly neridronate, approved for pediatric use in patients with osteogenesis imperfecta (9), could be suggested, as it is efficacious in bone mineral density increase and is well tolerated. Randomized controlled trials, nevertheless, are needed to establish the efficacy and safety of treatment with neridronate in IBD patients.

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## References

- REYES ML, HERNANDEZ MI, KING A *et al.*: Corticosteroid-induced osteoporosis in children; outcome after two-year follow-up, risk factors, densitometric predictive cut-off values for vertebral fractures. *Clin Exp Rheumatol* 2007; 25: 329-35.
- KLEINMAN RE, BALDASSANO RN, CAPLAN A *et al.*: North American Society for Pediatric Gastroenterology, Hepatology And Nutrition. Nutrition support for pediatric patients with inflammatory bowel disease: a clinical report of the North American Society for Pediatric Gastroenterology, Hepatology And Nutrition. *J Pediatr Gastroenterol Nutr* 2004; 39: 15-27.
- WALTHER F, FUSCH C, RADKE M *et al.*: Osteoporosis in pediatric patients suffering from chronic inflammatory bowel disease with and without steroid treatment. *J Pediatr Gastroenterol Nutr* 2006; 43: 42-51.
- THEARLE M, HORLICK M, BILEZIKIAN JP *et al.*: Osteoporosis: an unusual presentation of childhood Crohn's disease. *J Clin Endocrinol Metab* 2000; 85: 2122-6.
- LAND C, RAUCH F, MONTPETIT K *et al.*: Effect of intravenous pamidronate therapy on functional abilities and level of ambulation in children with osteogenesis imperfecta. *J Pediatr* 2006; 148: 456-60.
- MORA S, BARERA G: Bone mass and bone metabolism in pediatric gastrointestinal disorders. *J Pediatr Gastroenterol Nutr* 2004; 39: 129-4.
- STEELMAN J, ZEITLER P: Treatment of symptomatic pediatric osteoporosis with cyclic single-day intravenous pamidronate infusions. *J Pediatr* 2003; 142: 417-23.
- UNAL E, ABACI A, BOBER E *et al.*: Efficacy and safety of oral alendronate treatment in children and adolescents with osteoporosis. *J Pediatr Endocrinol Metab* 2006; 19: 523-8.
- GATTI D, ANTONIAZZI F, PRIZZI R *et al.*: Intravenous neridronate in children with osteogenesis imperfecta: a randomized controlled study. *J Bone Miner Res* 2005; 20: 758-63.