Efficacy of Pamidronate in Children with Osteoporosis due to Corticosteroid Therapy

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Background : Steroid-induced osteoporosis (SIO) is one of the serious complications of long-term steroid therapy, especially in growing children. Recently bisphosphonates have been used to treat or prevent SIO in adult, which is rare in children with glomerular diseases. We studied the effect of pamidronate on SIO using dual energy X-ray absorptiometry and biochemical markers of bone turnover.

Methods : 56 children receiving moderate-to-high doses of steroids were enrolled. They had no history of bone, liver, or endocrine disease except kidney. Patients were stratified by baseline bone mineral density (BMD) finding. One study included 28 patients who were assigned to receive corticosteroids with placebo for 3 month for prevention of SIO. Second study included 28 patients diagnosed with SIO 3 months prior to administration of pamidronate 100mg daily. All patients received daily oral calcium supplementation (500 mg/day). Chemistry and bone mineral density (BMD) were performed at baseline, 3months in all patients. Parathyroid hormone (PTH), serum osteocalcin, and urinary dipyridinoline were performed in all patients.

Results : In overall population, the mean lumbar spine BMD decreased from 0.754±0.211 (g/cm^2) to 0.728±0.208 (g/cm^2) in the placebo group ($p=0.0004$) and increased from 0.641±0.145 (g/cm^2) to 0.653±0.176 (g/cm^2) in the pamidronate group ($p>0.05$).

Conclusions : Pamidronate appears to be effective in preventing SIO in children with glomerular diseases requiring long-term steroids therapy. Further careful observation and follow-up might be needed for children receiving bisphosphonate such as pamidronate.