primary studies - published RCT

Treatment of low bone density in young people with cystic fibrosis: a multicentre, prospective, open-label observational study of calcium and calcifediol followed by a randomised placebo-controlled trial of alendronate

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Study design (if review, criteria of inclusion for studies)

Multicentre trial in two phases. The first phase was an open-label, 12-month observational study of the effect of adequate calcium intake plus calcifediol. The second phase was a 12-month, double-blind, randomised, placebo-controlled, parallel group study of the efficacy and safety of oral alendronate

Participants

Children, adolescents, and young adults with cystic fibrosis. The second phase was a 12-month, double-blind, randomised, placebo-controlled, parallel group study of the efficacy and safety of oral alendronate in patients whose bone mineral apparent density had not increased by 5% or more by the end of the observational phase. 171 patients (mean age 13.8 years, SD 5.9, range 5-30).

Interventions

The first phase was an open-label, 12-month observational study of the effect of adequate calcium intake plus calcifediol. The second phase was a 12-month, double-blind, randomised, placebo-controlled, parallel group study of the efficacy and safety of oral alendronate. Patients were randomly assigned to either alendronate or placebo.

Outcome measures

Both patients and investigators were masked to treatment assignment. Dual x-ray absorptiometry at baseline and every 6 months thereafter, corrected for body size, to assess lumbar spine bone mineral apparent density. Bone turnover markers and other laboratory parameters every 3-6 months. The primary endpoint was mean increase of lumbar spine bone mineral apparent density, assessed in the intention-to-treat population.

Main results

540 patients screened and 171 enrolled (mean age 13.8 years, SD 5.9, range 5-30). In the observational phase, treatment with calcium and calcifediol increased bone mineral apparent density by 5% or more in 43 patients (25%). 128 patients entered the randomised phase. Bone mineral apparent density increased by 16.3% in the alendronate group (n=65) versus 3.1% in the placebo group (n=63; p=0.0010). 19 of 57 young people (33.3%) receiving alendronate attained a normal-for-age bone mineral apparent density Z score. In the observational phase, five patients had moderate episodes of hypercalciuria, which resolved after short interruption of calcifediol treatment. During the randomised phase, one patient taking alendronate had mild fever versus none in the placebo group; treatment groups did not differ significantly for other adverse events.

Authors' conclusions

Correct calcium intake plus calcifediol can improve bone mineral density in some young patients with cystic fibrosis. In those who do not respond to calcium and calcifediol alone, alendronate can safely and effectively increase bone mineral density.

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See also

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Keywords

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