

Effects Of Intravenous Zoledronic Acid Plus Subcutaneous Teriparatide In Postmenopausal Osteoporosis

General Topics / Basic Sciences

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Background

Clinical data suggest concomitant therapy with bisphosphonates and parathyroid hormone (PTH) may blunt the anabolic effect of PTH.

Objectives

The purpose of this study is to evaluate the effects of combination therapy with an intravenous infusion of zoledronic acid 5 mg and daily subcutaneous teriparatide 20 µg versus either agent alone on bone mineral density (BMD) and bone turnover markers.

Study Design & Methods

From January 2011 to December 2017, 90 postmenopausal women with osteoporosis (mean age 65 ± 9 years) were randomized to a single infusion of zoledronic acid 5 mg plus daily subcutaneous teriparatide 20 µg (n = 30), zoledronic acid alone (n = 30), or teriparatide alone (n = 30).

The primary endpoint was percentage increase in lumbar spine and total hip BMD (assessed by DXA) at 52 weeks versus baseline.

Results

At 52 weeks, increases in spine BMD were 7.5% with combination therapy, 7.0% with teriparatide, and 4.4% with zoledronic acid. Increases in total hip BMD at 52 weeks were 2.3% with the combination, 1.1% with teriparatide, and 2.2% with zoledronic acid.

Serum β-CTX was reduced to its nadir by week 4 with zoledronic acid, with small increases thereafter. In the teriparatide group, mean levels were unchanged through week 4, then increased to a peak at week 26, and decreased slightly thereafter. An initial prominent reduction with combination therapy, of similar magnitude to the reduction seen with zoledronic acid alone, was followed by a gradual increase after week 8, with levels remaining above baseline for the latter half of the year.

In the zoledronic acid group, PINP declined through week 8 with little subsequent change. In the teriparatide group, in contrast to what was seen with β-CTX, PINP was elevated by week 4. With combination therapy, PINP also increased through week 4, declined slightly between weeks 4 and 8, and then increased progressively, with levels above baseline from 6 to 12 months.

Conclusions

The authors concluded that while teriparatide increases spine BMD more than zoledronic acid and zoledronic acid increases hip BMD more than teriparatide, combination therapy provides the largest, most rapid increments when both spine and hip sites are considered.