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Teriparatide (recombinant human parathyroid hormone [1-34]) increases foot bone remodeling in diabetic chronic Charcot neuroarthropathy: a randomized double-blind placebo-controlled study.

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Abstract

BACKGROUND: Currently, there is no consensus regarding the medical treatment of chronic Charcot neuroarthropathy (CN) of foot, except for effective off-loading. Because tarsal bones are predominantly trabecular, teriparatide may improve the macro architecture of foot bones in chronic CN. **METHODS:** People with diabetes and chronic CN were randomized to receive either 20 µg teriparatide or placebo subcutaneous daily for 12 months. Thirty-eight patients were screened and data were analyzed for 20. The maximum standardized uptake (SUV_{max}) value of ^{18} F-FDG PET/CT the region of interest, bone turnover markers and foot bone mineral density BMD were determined. The primary outcome measure was change in SUV_{max} g/ml. **RESULTS:** Mid-foot was the most common region involved. After 12 months, SUV_{max} increased from 30.6 ± 14.7 to 37.7 ± 18.0 (P = 0.044) in the teriparatide group, but decreased from 27.6 ± 12.2 to 22.9 ± 10.4 with placebo (P = 0.148). The estimated treatment difference (ETD) was 11.9 ± 4.3 (95% CI 2.9, 20.8; P = 0.012). Similarly, P1NP increased with teriparatide (19.8 ± 5.5; P = 0.006) but decreased with placebo (-5.1 ± 3.8 ng/mL; P = 0.219); ETD was 24.8 ± 6.6 (95% CI 10.8, 38.8; P < 0.001) and CTX increased in both the teriparatide and placebo groups. Foot BMD increased by 0.06 ± 0.04 g/cm^2 (P = 0.192) with teriparatide, but decreased by -0.06 ± 0.08 g/cm^2 with placebo (P = 0.488; intergroup comparison, P = 0.096). **CONCLUSION:** Teriparatide increases foot bone remodeling by an osteoanabolic action in people with CN.

KEYWORDS: Charcot neuroarthropathy; bone mineral density; bone turnover markers; diabetic foot; teriparatide;

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