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LETTER TO THE EDITOR

Comment on Kanis et al.: "European guidance for the diagnosis and management of osteoporosis in postmenopausal women"

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Dear Editors,

Kanis et al. erroneously state in a recent paper about the diagnosis and management of osteoporosis in postmenopausal women that 100 μg of PTH(1-84) is equivalent to 40 μg of teriparatide, PTH(1-34) [1]. This equivalence was calculated from their respective molecular weights (4,115 for teriparatide [2], 9,426 for full-length PTH [3]) but does not consider bioavailability. The bioavailability of PTH(1-34) and PTH(1-84) are 95% and 55%, respectively [4, 5].

Bioequivalence requires that the number of PTH(1-34) and PTH(1-84) molecules should be the same: $N_{\mathrm{PTH(1\text{-}34)}}=N_{\mathrm{PTH(1\text{-}84)}}$

The clinical dose is based on molecular weight and bioavailability leading to the equation:

$$\frac{m_{\mathrm{PTH}(1-34)}\times P_{\mathrm{abs}(1-34)}}{M_{\mathrm{PTH}(1-34)}} = \frac{m_{\mathrm{PTH}(1-84)}\times P_{\mathrm{abs}(1-84)}}{M_{\mathrm{PTH}(1-84)}}$$

(where M is the molecular weight of PTH, P_{abs} the bioavailability, and m the mass of PTH).

Using this calculation, 100 μg of PTH(1-84) is equivalent to 25 μg of teriparatide {100 μg×(55/95)×4,115/9,426=25 μg} and these are the approximate doses used in the treatment of postmenopausal osteoporosis.

References

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