DRUG REVIEW

Abaloparatide

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Abaloparatide is a synthetic peptide analog of human parathyroid hormone-related protein (PTHrP). In 2017, the FDA approved its use in postmenopausal women with osteoporosis at high risk for fracture. Abaloparatide demonstrated a beneficial effect on BMD compared to teriparatide for postmenopausal women with osteoporosis and the prevalence of hypercalcemia in the abaloparatide is less than that of teriparatide.[1] Abaloparatide significantly increased BMD at non-vertebral sites and significantly decreased the risk of major osteoporotic fractures compared with teriparatide. [2] Patients who are intolerant or have failed to respond to traditional osteoporosis therapy are often prescribed abaloparatide. It is FDA-approved in the following scenarios:

a) A T score of <-2.5

b) T score of -2.5 to -1 with a high FRAX score

c) History of fragile fractures

Mechanism of action: Abaloparatide is a human parathyroid hormone-related protein that stimulates the Gs-protein-mediated cAMP pathway. It is a selective parathyroid hormone type 1 receptor agonist with anabolic activity on osteoblasts, which increases osteoblast activity. It helps to shift the balance of bone remodeling to favour bone formation by osteoblasts while causing a minimal increase in osteoclast bone resorption. Abaloparatide increases the formation of bone at periosteal, trabecular, and endocortical surfaces. It leads to a longer-lasting signaling response that gradually increases cAMP by binding to the R0 conformation of PTHR1. However, it also increases the risk of hypercalcemia due to increased osteoclast activity, as seen with teriparatide.

Administration:

1. Abaloparatide is administered through subcutaneous injection. The recommended dose for subcutaneous injections is 80 mcg once daily into the periumbilical region of the abdomen.
2. It is supplied as a single-patient-use prefilled pen intended to deliver 30 doses.
3. The patient should sit or lie down for the first few doses of abaloparatide administration, as it can cause orthostatic hypotension within four hours of injection.
4. Supplement calcium and vitamin D if dietary intake is inadequate with subcutaneous

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administration of abaloparatide.

5. The transdermal patch is a new way of delivering medication that is currently being tested in clinical trials. The patch contains tiny needles that release abaloparatide at different doses of 50mcg, 100mcg, and 150mcg once a day for up to 6 months. The patch is applied to the thigh for 5 minutes, and the medication is delivered under the skin.

Adverse effects:

Abaloparatide is well tolerated with mild adverse effects such as nausea, dizziness, headache, palpitations, and hypercalciuria. However, it has a black box warning due to an increased risk of osteosarcoma.

Contraindications:

Abaloparatide has no absolute contraindications, but caution is advised in patients with severe renal impairment as the drug is eliminated via kidneys.

Abaloparatide is not recommended for use in pregnancy and lactation. It should be avoided in patients with open epiphyses, genetic predisposition to osteosarcoma, Paget disease, idiopathic increased alkaline phosphatase levels, bone malignancies, or open epiphyseal plates. The effects of abaloparatide on pregnant and breastfeeding women, as well as their infants, are unknown. It is also unclear whether it has any impact on milk production. in lactating women [3]

Conclusion

Abaloparatide represents a significant advancement in osteoporosis treatment, offering a potent anabolic option with favorable efficacy and safety profiles. As research continues to explore alternative delivery methods, such as transdermal patches, the future holds promise for further optimizing the administration of this therapeutic agent. With its current successes and ongoing exploration, abaloparatide paves the way for a dynamic future in the realm of osteoporosis therapeutics.

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