DRUG CORNER

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What do Bisphosphonates Do?

Bishosphonates are small inorganic molecules that bind to calcium and as a result are taken up into bone. They inhibit the activity of the osteoclasts and interrupt the increased bone breakdown.

Bisphosphonates therefore have several potential beneficial effects including

1. Preventing / slowing down further bone breakdown
2. Reducing bone pain and the need for pain-killers
3. Preventing and correcting hypercalcaemia
4. Reducing the need for radiotherapy
5. Reducing the likelihood of pathological fractures due to bone disease
6. Improving quality of life, particularly by decreasing pain and maintaining mobility Improving the chances of healing and recovery of strength of bone

Zolendronic Acid (Or) Zolendronate

Mechanism of Action

Zolendronic acid slows down bone resorption, allowing the bone-forming cells time to rebuild normal bone and allowing bone remodeling.

Dosage

1. Usual Adult Dose for Osteolytic Bone Lesions of Multiple Myeloma and Bone metastases of solid tumors: 4 mg IV over no less than 15 minutes, every 3 to 4 weeks
2. Usual Adult Dose for Hypercalcemia of Malignancy: Maximum dose: Single dose of 4 mg IV infusion over no less than 15 minutes.
3. Usual Adult Dose for Osteoporosis: 5 mg IV infusion over no less than 15 minutes, once a year.
4. Usual Adult Dose for Prevention of Osteoporosis: 5 mg IV infusion over no less than 15 minutes, every 2 years

Indications

1. **Bone Complications of Cancer**

   It is used to prevent skeletal fractures in patients with cancers such as multiple myeloma and prostate cancer, as well as for treating osteoporosis. It can also be used to treat hypercalcemia of malignancy and can be helpful for treating pain from bone metastases.

   It can be administered at home rather than in hospital. Such administration has shown safety and quality-of-life benefits in breast cancer patients with bone metastases.

2. **Osteoporosis**

Zolendronic acid may be given as a 5mg infusion once per year for treatment of osteoporosis in men and post-menopausal women at increased risk of fracture.

In 2007, the U.S. Food and Drug Administration (FDA) for the treatment of postmenopausal osteoporosis.

3. **Pagets disease**

As a single dose of 5 mg is used for the treatment of paget's disease.

Contraindications

1. Poor renal function (e.g. CrCl< 30 mL/min)
2. Hypocalcemia
3. Pregnancy
4. Paralysis

Interactions

Aminoglycosides, other nephrotoxic agents or bisphosphonates, calcitonin, diuretics, thalidomide, anti-angiogenic drugs.

Side effects

The side effects can include

1. Fatigue
2. Anemia
3. Muscle aches
4. Fever and
5. Swelling in the feet or legs.

Flu-like symptoms are commonly experienced after the first zolendronate infusions, although not subsequent infusions, and are thought to occur because of its potential to activate human gamma/delta T cells.

Osteonecrosis of the jaw.

Appropriate hydration is important prior to administration & adequate calcium and vitamin D intake prior to the therapy in patients with preexisting hypocalcemia, and for 10 days following Aclasta in patients with Paget 's disease of the bone.

Zolendronate is rapidly processed via the kidney; consequently its administration is not recommended for patients with reduced renal function or kidney disease.

Monitoring

1. **Metabolic:** Serum calcium, electrolytes, phosphate, magnesium.
2. **Hematologic:** Complete blood count, hematocrit/ hemoglobin.
3. **Renal:** Serum Creatinine /creatinine clearance before, during, and after treatment.

Patient education

1. Patients should tell their doctor if they have kidney problems before starting treatment with this drug.
2. Patient should have a dental examination prior to treatment with this drug and should avoid invasive dental procedures during treatment.
3. Additional oral daily calcium and vitamin supplementation are important during treatment with this drug.

Conclusion

Zoledronic acid is an injectable drug in a class of drugs referred to as bisphosphonates. Zoledronic acid is prescribed for the treatment of osteoporosis in postmenopausal women and men, Paget's disease of bone in men and women, osteoporosis prevention in

postmenopausal women, and the treatment of steroid-induced osteoporosis. Side effects, drug interactions, warnings and precautions, and patient information should be reviewed prior to taking any medication.

References

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