Medication in osteoporosis

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Bisphosphates

- decrease the risk of hip fracture, wrist fracture, and spine fracture in people with osteoporosis:

Alendronate (Fosamax), risedronate (Actonel), ibandronate (Boniva), and zoledronate (Reclast) are bisphosphonates.

To reduce side effects and to enhance absorption

all bisphosphonates taken by mouth (orally) should be taken <u>in the morning</u>, <u>on an empty stomach</u>, <u>30 minutes before breakfast</u>, and with <u>at least 8 ounces (240 ml) of water </u>(not juice). This improves the absorption of the biphosphonate.

- Taking the pill sitting or standing (as well as drinking adequate amounts of liquids) minimizes the chances of the pill being lodged in the esophagus, where it can cause ulceration and scarring

- Patients should also remain upright for at least 30 minutes after taking the pill to avoid reflux of the pill into the esophagus
- Newer intravenous bisphosphonates, such as ibandronate (Boniva) and zoledronate (Reclast), bypass the potential esophagus and stomach problems

- Food, calcium, iron supplements, vitamins with minerals, or antacids containing calcium, magnesium, or aluminum can reduce the absorption of oral bisphosphonates, thereby resulting in loss of effectiveness.

- Therefore, oral bisphosphonates should be taken with plain water only in the morning before breakfast. Also, no food or drink should be taken for at least 30 minutes afterward.

Alendronate (Fosamax)

- Alendronate (Fosamax) is a biphosphonate antiresorptive medication.
- Alendronate is approved for the prevention and treatment of postmenopausal osteoporosis as well as for osteoporosis that is caused by cortisone-related medications .
- Alendronate has been shown to increase bone density and reduce fractures in the spine, hips, and arms.

Alendronate (Fosamax)

- Fosamax is taken by mouth once a week to prevent and treat postmenopausal osteoporosis.
- Alendronate is the first osteoporosis medication also approved for increasing bone density in men with osteoporosis, either in a daily or a weekly dosing schedule.

- Fosamax generally is well tolerated with few side effects.
- One side effect of alendronate is irritation of the esophagus (the food pipe connecting the mouth to the stomach).
- Inflammation of the esophagus (esophagitis) and ulcers of the esophagus have been reported infrequently with alendronate use.

Ibandronate (Boniva)

- Ibandronate (Boniva) is a bisphosphonate for prevention and treatment of postmenopausal osteoporosis.
- It is available in formulations for both daily and monthly oral use as well as for intravenous use every three months.

- Estrogen is a hormone which among other actions, regulates the turnover (formation and destruction) of bone.
- Decreases in estrogen levels that are seen after menopause or after removal of the ovaries, lead to a loss of bone density and weakened bones, a condition called osteoporosis.

- Raloxifene decreases bone turnover and increases bone density although not to the same extent as estrogen itself.
- This makes bones stronger and prevents fractures in women with osteoporosis.

- Raloxifene decreases low density lipoprotein (LDL or "bad") cholesterol in the blood;
- however, unlike estrogen, raloxifene does not increase high density lipoprotein (HDL or "good") cholesterol.

Raloxifene (Evista)

- belongs to a class of drugs called selective estrogen receptor modulators (SERMs).
- SERMs work like estrogen in some tissues but as an antiestrogen in other tissues.
- The SERMs were developed to reap the benefits of estrogen while avoiding the potential side effects of estrogen.

- Thus, raloxifene can act like estrogen on bone but as an antiestrogen on the lining of the uterus where the effects of estrogen can promote cancer.

- Raloxifene generally is prescribed once daily. It can be taken with or without meals. Persons with cirrhosis may need lower doses.

DRUG INTERACTIONS

- Cholestyramine (Questran) reduces the absorption of raloxifene. Therefore, these two medications should be taken several hours apart. Raloxifene may slightly reduce the ability of blood to clot and thus increase the effects of medications that reduce clotting (blood thinners).

- Therefore, if raloxifene is given with blood thinners such as warfarin (Coumadin), the ability of blood to clot may need to be monitored more closely with frequent measurements of the prothrombin time of blood.

SIDE EFFECTS

- The most common side effects with raloxifene are hot flashes (seen in 1 of every four persons), sinusitis (1 in 10), weight gain (1 in 11), muscle pain (1 in 12), leg cramps (1 in 20), and ankle swelling (1 in 30).

Prevention of osteoporosis due to long-term corticosteroids

- The long-term use of corticosteroids (such as prednisone, cortisone, and prednisolone) can lead to osteoporosis.
- Corticosteroids cause decreased calcium absorption from the intestines, increased loss of calcium through the kidneys in urine, and increased calcium loss from the bones

- To prevent bone loss while on long-term corticosteroids, patients should have an adequate calcium (1,000 mg daily if premenopausal, 1,500 mg daily if postmenopausal) and vitamin D intake; however, calcium alone or combined with vitamin D cannot be relied upon to prevent bone loss from corticosteroids unless other prescription medications are added

- discuss with their doctor the use of either alendronate, risedronate, and zoledronate, which have been approved for the prevention and treatment of corticosteroid-induced osteoporosis

- discuss with their doctor about having a DXA bone density scan prior to beginning therapy and careful monitoring for osteoporosis during therapy.

- The American Medical Association and other reputable medical organizations recommend that repeat bone density testing (DXA scans) *not* be done for monitoring osteoporosis treatment or prevention on a routine basis

- Doctors simply do not know how to use repeated bone density measurements during therapy

1. Bone density changes so slowly with treatment that the changes are smaller than the measurement error of the machine. In other words, repeat DXA scans cannot distinguish between a real increase in bone density due to treatment or a mere variation in measurement from the machine itself

2. The real purpose of osteoporosis treatment is to decrease future bone fractures. There is no good correlation between increases in bone density with decreases in fracture risks with treatment.

- For example, alendronate has been shown to decrease fracture risk by 50% but only to increase bone density by a few percent. In fact, most of the fracture reduction with raloxifene is not explained by raloxifene's effects on bone mineral density.

3. One density measurement taken during treatment will not help the doctor plan or modify treatment.

For example, even if the DXA scan shows continued deterioration in bone density during treatment, there is not yet research data demonstrating that changing a medication, combining medications, or doubling medication doses will be safe and helpful in decreasing the future risk of fractures

4. Even if bone density deteriorates during treatment, it is quite likely that the patient would have lost even more bone density without treatment.

5. Recent research has shown that women who lose bone density after the first year of HRT will gain bone density in the next two years of therapy, whereas women who gain in the first year will tend to lose density in the next two years of therapy.

- Therefore, bone density during treatment naturally fluctuate naturally, and these fluctuations may not correlate with the prevention of fractures due to the medication.

- For all of these reasons, as surprising as it may sound to many people (and even some doctors!), rechecking bone density is not at all like checking blood pressure during treatment of high blood pressure (hypertension).

- Routine bone density testing during treatment is unlikely to be helpful. In the future, however, if ongoing research brings new technology or new therapies, testing decisions may change