Osteoporosis: Prevention and natural treatment

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Underdiagnosed until quite recently, osteporosis has become one of the biggest health problems in developed countries, affecting approximately 30% of all postmenopausal women in the United States and Europe. Osteoporosis is characterized by a debilitation of the bone microarchitecture and a substantial loss of bone mass. This can eventually cause severe fractures that can lead to disability.

First of all, let's talk about bone components and formation:

There are basically three different types of cells that can be found in the bone:

Osteocytes: These are cells inside the bone and are essential for its correct functioning: they come from osteoblasts and also direct the osteoclasts where the bone needs to be dissolved.

Osteoblasts: These are the cells that form new bone. As the osteoclasts, they come from the bone marrow. Many osteogenic cells will become osteoblasts.

Osteoclasts: The last group is related to the white blood cells. These large cells dissolve the bone.

Once we know how these cells work, we can continue explaining the effect of osteoporosis on the bones: in a healthy bone, there's a correct balance between bone formation and destruction. In osteoporosis, osteoclasts dissolve bone faster than it is created. As a result the density of the osteoporotic bone is much lower.

Bone formation and remodelling are largely dependent on two basic factors: mechanical loading of the bone and nutrition, especially the ingestion of several nutrients:

-Calcium, as the biggest component of the bone structure.

–Vitamin D, that allows your body to absorb calcium.

–Zinc, magnesium, phosphorus and vitamin K are also crucial in bone mineralization and renewal.

As for the mechanical loading, there's a limited time that we can increase our bone mass. Most bone growth occurs during childhood, adolescence and early adulthood. Most studies suggest that the peak of bone mass is reached by 30 years of age and from early 40's there's a start of a slow but steady decline. Men normally reach a higher peak of bone mass and, even when they also lose bone mass in the second half of their life, osteoporosis is quite unusual in males. What has physical activity to do with this? Well, mechanical bone loading produces new bone formation. As we already said, this process is usually more effective before the third decade of life. Thus, high impact activities such as jumping, running or playing team sports are associated with higher bone density.

Women reach a lower peak of bone mass and therefore have bigger risk of osteoporosis

It must be said that not only nutrients and mechanical loading are related to bone formation. There're also plenty of hormones that regulate the entire process:

–Parathyroid hormones: Produced close to the thyroid glands, they stimulate the bone formation and maintain calcium levels in the bone.

–**Calcitriol**: This hormone is derived from Vitamin D. It stimulates absorption of calcium and phosphorus from the intestines.

–**Calcitonin**: Inhibits bone destruction and high levels of calcium in blood (thus preventing cardiovascular problems).

–**Estrogen**: This sexual hormone induces bone growth but also regulates the length of the bones at the end of the puberty. Thus, women (who normally have higher levels of this hormone) are normally shorter than men.

–**Testosterone**: It can be converted to estrogen, therefore stimulating bone growth. It also stimulates muscle growth which, by the way, leads to bigger bones as they need to support more tension from the muscles.

–**Cortisol**: Low levels of cortisol are necessary for correct bone formation. However, larger amounts induce bone destruction. Synthetic forms of cortisol, normally used for the treatment of autoimmune and inflammatory diseases, such as prednisone and other corticosteroids, induce bone destruction and inhibit bone formation.

-Other hormones, such as **growth hormone**, **thyroid hormones** and **insulin** have also an important role in bone formation and destruction.

Other than that, bone growth is also limited by genetic factors that, nowadays, can't be modified. Smoking has also been linked to increased bone destruction. While the evidence keeps growing, it would be wise to avoid smoking not just because of osteoporosis risk but also because of other negative health consequences. It is obvious that osteoporosis is not always a consequence of nutritional deficiencies or lack of physical activity but can also occur after overuse of specific drugs or the appearance of hormonal disturbances.

Once we know the basics about bone parts and their formation, we can start to talk about osteoporosis. So, first of all, how is it diagnosed?

First, as osteoporosis causes no symptoms and usually manifests itself first as an unexpected fracture, Bone Mineral Density Scans have become the gold standard for the diagnosis. BMD scans are low radiation x rays that can detect changes in the bone density. Performed correctly, the margin of error is very low and the diagnosis is quite simple. However, several factors need to be taken into account before a diagnosis of osteoporosis is given to the patient:

-A single BMD scan can't diagnose osteoporosis. A patient can have low bone density but that doesn't mean he/she is actually losing bone. Therefore, at least two BMD scans during a period of two years must be performed. Also, the follow up of the test should be done in the same machine and performed by the same specialist.

-The normal margin of error of BMD scans is 3-5%. Therefore, a 4% of bone loss during two years can't be considered as actual bone loss.

-Shorter people have naturally less BMD than taller people.

-Correct positioning of the patient during the test is fundamental for the obtention of correct results. The most common mistake is the incorrect rotation of the hip. A study concluded that 48,6% of BMD specialists in the US positioned the patient's spine incorrectly during the test.

-The vast majority of rheumatologists can't read a BMD scan. Therefore, they won't be able to distinguish any possible error commited by the BMD specialist.

BMD scans are normally performed in 3 to 4 different locations:

-L1, L2, L3 and L4 vertebrae of the lumbar spine.

-Femoral neck

-Hips

-Distal radius.

Once the specialist obtains the results he compares them to the average 30 year old person of the same gender. This is called the T-Score and the results can be seen in the chart below:

Category	T-Score
Normal	0 to -1

Osteopenia	-1 to -2,5
Osteoporosis	less than -2,5

Each point in the T-score represents a 12% fall compared to the average.

There's also another scale, called Z-Score, which compares your results to the average of your gender AND age. This is only used for prevention as you can be in the average of your Z-score group but still have osteoporosis. Again, we would like to clarify that a negative T-score result doesn't mean much by itself as what the doctor wants to find is whether the patient is actually losing bone density.

Now that we have more knowledge about the definition and diagnosis of osteoporosis, lets talk about therapies.

First of all, it should be noted that there's no scientific evidence about bone density gains after being 40 years old. Thus, efforts should be oriented towards prevention and, once osteoporosis occurs, avoiding further bone mass loss.

Conventional treatment:

Doctors, as in many cases, rely mostly on drugs in the treatment of osteoporosis. Two of the most used kinds are bisphosphonates and new generation drugs such as Denosumab. The fact is that these drugs don't increase your bone density. They act by blocking bone breakdown, thus altering the entire bone cycle. This has severe consequences as, paradoxically, the use of these drugs comes with side effects such as bone fractures and necrosis of the jaw. As you can see, the treatment could be even worse than the disease itself. Although the initial phases of the disease are treated with the "wait and see" strategy, each year more and more people start taking drugs for their bone loss. Of course, the pharma industry couldn't be happier: imagine the money they can make by treating 30% of all postmenopausal women.

Some doctors who have a more holistic approach also use vitamin D and calcium supplements. However, they tend to forget the role of other minerals in bone formation. Therefore, they can even aggravate the problem. Finally, conventional treatments only treat the symptoms and not the cause of the disease. In the case of osteoporosis, more than half of the cases are caused by hormonal imbalances and diseases and not by improper nutrition of physical activity. Therefore, if you don't address the underlying problem, such as an autoimmune disease, the patient will continue to lose bone mass. Finally, some drugs used in the treatment of other diseases, especially corticosteroids, can cause osteoporosis. In this case, unless the patient stops using the drug, the bone loss will continue.

Prevention: Our proposal

Prevention of osteoporosis should start as soon as a person is born. Especially in the case of women, a diet rich in vitamin D and all essential minerals should be started once breastfeeding is stopped.

–Vitamin K can be found in cabbage, spinach, chard, kale and broccoli. Humans normally need 200 micrograms of this vitamin daily. A dose of 100 microgram daily of Mk-7 reduced by four the risk of hip fractures.

–Vitamin D can be obtained from sun exposure, eggs or wild salmon. We recommend taking a supplement, especially in winter months, in order to reach blood levels of at least 35 ng/ml.

-Calcium can be obtained from bone broths or green leafy vegetables, apart from dairy products which we don't recommend in general. We don't recommend supplementing with calcium as the average western diet provides more than necessary.

–Magnesium deficiency is widespread and dangerous. This mineral is essential for bone health and nowadays it is much more difficult to get all the magnesium you need from foods, especially after the steady lose of this mineral in the earth. Seaweed, nuts and dark chocolate are great sources of magnesium. Apart from these foods, we recommend supplementing with 200 milligrams daily.

–Zinc deficiency is fairly common: about one-third of the americans is zinc deficient. Seafood and meats are great sources of zinc. We also recommend supplementing with 15 to 30 milligrams per day, more in the case of athletes.

-Phosphorus: This mineral is a crucial substance in calcium phosphate, which makes the bones hard. Phosphorus is found in sardines, eggs and nuts and we don't recommend supplementing with this mineral.

–Omega 3: Although it doesn't have a specific role in bone formation, inflammation has been linked to a bigger risk of suffering osteoporosis. We recommend increasing the consumption of wild fish such as mackerel, sardines, anchovies or wild salmon. Also, supplement with at least 1500mg of EPA and DHA per day. Another two natural substances that can reduce inflammation in the body are curcumin and boswellia.

Once we addressed the possible nutritional deficiencies, it's time for other possible culprits of osteoporosis:

-High impact exercise such as jumping, athletics, running, team sports and strength training in a gym should be started as soon as possible. The bigger the amount of time spent doing these activities during your adolescence, the smaller the chances you will suffer from osteoporosis in the second half of your life. Prioritize outdoor activities as they will expose you to the sun, thus receiving more vitamin D.

-Avoid bad habits such as smoking, drinking and doing drugs. These three things have been linked with bigger risk of osteoporosis.

-Sleep at least 8 hours per day and reduce stress in your life: yoga, meditation or any other activity that helps you relax will be usfeul. Remember that high cortisol levels are linked to bone destruction.

-Address your diet: even if you follow our advices related to mineral and vitamin deficiencies, there are many nutritional interventions that will help you prevent osteoporosis: avoid inflammatory foods such as grains, sugar, trans oils and processed foods. Increase your intake of vegetables, fruits and wild fish. If you want more information about a healthy diet, you can check out our article about this topic:

Once osteoporosis is present: Natural treatment

As we said earlier, there's no intervention that can increase your bone density once you're in the fourth decade of your life. Even when this is the case, there are many things you can do in order to prevent further bone loss:

-Address nutritional deficiencies: vitamin D and minerals, as was mentioned above.

-Correct your diet and habits: this was also described above.

-Stop inflammation in your body: omega 3, boswellia and curcumin are very indicated in this phase.

-Start a personalized physical activity program: once you have osteoporosis you must reduce activities that can cause a fracture. Still, there are many options that can reduce your bone loss and improve your quality of life: vibration platforms, plyometric exercises and strength & rehabilitation exercises are among them. If you want a specific program for you, contact us and our physical activity specialist will help you out.

-Address the cause of the bone loss: this is the most important part when osteoporosis already exists. In our experience, many cases have an underlying cause that, when treated, will stop the bone loss from happening. This is the case in women who suffer from thyroid diseases such as Hashimoto or Graves. Also, corticosteroids cause osteoporosis. If you suffer from a disease that needs to be treated with prednisone, treat the disease with the methods mentioned above in order to ditch the steroids as fast as you can. In case you already suffer from a thyroid disease, check out our article about Hashimoto:

In case you want help about your particular case, don't hesitate and contact us, we'll try to help you out:

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