EFAD The European Federation of the Associations of Dietitians

THE VOICE OF EUROPEAN DIETETICS

Oncology Nutrition recommendations for cancer patients at risk for osteoporosis

Author: Diana Artene, ND, MNS, PhD
On behalf of EFAD European Specialist Dietetic Network for Oncology

The fact that estrogen receptor positive breast cancer patients have an increased risk of osteoporosis is frequently addressed by many medical oncologists only with calcium and vitamin D supplements, frequently without assessing first if the patient is deficient or not in these nutrients.

But, vitamin D is a liposoluble vitamin, thus it is not excreted when in excess. Excessive intake of vitamin D in the case of normal blood levels can lead to iatrogenic vitamin D hypervitaminosis (Taylor & Davies, 2018). Vitamin D supplementation without the patient having a deficiency is the second cause of hypercalcemia after hyperparathyroidism (Sharma et al., 2017).

The intake of vitamin D3 dietary supplements without an objectively proven deficiency does not prevent osteoporosis, excessive supplementation increasing the risk of fractures (Reid et al., 2014). Also, the prophylactic prescription of calcium dietary supplements in patients without objectively known calcium deficiency does not prevent osteoporosis, nor does it decrease fractures risk (Cano et al., 2018).

To counteract vitamin D3 deficiency (=reaching a blood level above 30 ng/ml) 800 UI daily vitamin D3 still is enough to avoid the deregulation of parathormone secretion and to avoid bone fractures.

Besides ensuring an adequate dietary intake of calcium and vitamin D and the eventual supplementation in case of objectively proven deficiency, the prevention, and counteraction of osteoporosis has to consider at least 4 more important factors:

1. **Regular practice of resistance training** (Sardeli et al., 2018).
2. **No smoking** (Wong et al., 2018).
3. **Vitamin K intake** – from foods like spinach, lettuce, nettle, lewd, parsley, peas, leek, all sorts of cabbage etc. It is important to underline that recommending vitamin K dietary supplements to counteract osteoporosis is not sustained by the current scientific literature (Hamidi et al., 2013).
4. **Normal adiposity –** people with hepatic steatosis and overweight and obese persons have lower blood levels of vitamin D3 because of its deposition inside the fat tissue (Pereira-Santos et al., 2015).
   Vitamin D3 blood level goes back to normal without any dietary supplements when these patients decrease adiposity (Rock et al., 2012).
   But, although fat loss contributes to normalizing vitamin D blood levels, any nutritional intervention meant to counteract obesity should consider that the following popular weight loss factors can worsen bones' health:
   - **Insufficient caloric intake associates increased bone loss** (Papageorgiou et al., 2017)
   - **Insufficient protein intake associates increased bone loss** (Rizzoli et al., 2018)

Because of the bone loss classically associated with caloric restriction and insufficient protein intake, weight loss in breast cancer patients under antiestrogenic treatment with or without ovarian suppression should be carefully designed and monitored by dietitians with expertise in oncology nutrition with a constant eye on the whole-body composition evolution, not by nutritionally untrained people focused on simply on weight loss.

References:

Cano A et al. "Calcium in the prevention of postmenopausal osteoporosis: EMAS clinical guide." Maturitas 107 (2018): 7-12.

Hamidi MS et al. Vitamin K and Bone Health. *Journal of clinical densitometry* 16.4 (2013): 409-413.

Papageorgiou M et al. "Effects of reduced energy availability on bone metabolism in women and men." Bone 105 (2017): 191-199.

Pereira-Santos M et al. "Obesity and vitamin D deficiency: a systematic review and meta-analysis." *Obesity reviews* 16.4 (2015): 341-349.

Reid IR et al. "Effects of vitamin D supplements on bone mineral density: a systematic review and meta-analysis." *The Lancet* 383.9912 (2014): 146-155.

Rizzoli R et al. "Benefits and safety of dietary protein for bone health—an expert consensus paper endorsed by the European Society for Clinical and Economical Aspects of Osteopororosis, Osteoarthritis, and Musculoskeletal Diseases and by the International Osteoporosis Foundation." Osteoporosis International (2018): 1-16.

Rock CL et al. "Weight Loss Is Associated With Increased Serum 25-Hydroxyvitamin D in Overweight or Obese Women." *Obesity* 20.11 (2012): 2296-2301.

Sardeli AV et al. "Resistance Training Prevents Muscle Loss Induced by Caloric Restriction in Obese Elderly Individuals: A Systematic Review and Meta-Analysis." *Nutrients* 10.4 (2018): 423.

Sharma LK et al. "The increasing problem of subclinical and overt hypervitaminosis D in India: An institutional experience and review." *Nutrition (Burbank, Los Angeles County, Calif.)* 34 (2017): 76.

Taylor PN & Davies JS. "A review of the growing risk of vitamin D toxicity from inappropriate practice." *British journal of clinical pharmacology* (2018).

Wong EM et al. "Women's Mid-Life Night Sweats and 2-Year Bone Mineral Density Changes: A Prospective, Observational Population-Based Investigation from the Canadian Multicentre Osteoporosis Study (CaMos)." International journal of environmental research and public health 15.6 (2018): 1079.