

Osteoporosis and Fragility Fractures: An Overview.

Osteoporoz ve Kırılganlık Kırıkları: Genel Bir Bakış.

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ABSTRACT

Osteoporosis (OP); It is a metabolic bone disease characterized by decreased bone mineral density (BMD) and bone strength, increased bone fragility and fracture risk, and deterioration in the microarchitecture of bone tissue. The most important cause of morbidity and mortality in OP are fragility fractures such as osteoporotic hip fractures. Prevention and treatment of osteoporosis can prevent hip fractures and comorbidities. In this paper, the available information about Osteoporosis and Osteoporotic fractures is briefly reviewed.

Key words: Osteoporosis, bone mineral density, osteoporotic fractures, bisphosphonates, treatment,

ÖZ

Osteoporoz (OP); kemik mineral yoğunluğu (KMY) ve kemik gücünde azalma, kemik kırılabilirliği ve kırık riskinde artma, kemik dokusunun mikromimarisinde bozulmayla karakterize metabolik kemik hastalığıdır. OP'daki en önemli morbidite ve mortalite nedeni osteoporotik kalça kırıkları gibi kırılabilirlik kırıklarıdır Osteoporozun önlenmesi ve tedavisi, kalça kırıklarını ve eşlik eden hastalıkları önleyebilir. Bu yazıda, Osteoporoz ve Osteoporotik kırıklarla ilgili mevcut bilgiler kısaca gözden geçirilmiştir.

Anahtar Kelimeler: Osteoporoz, kemik mineral yoğunluğu, osteoporotik kırık, bifosfonat, tedavi.

Received: 19.02.2022 Accepted: 14.03.2022 Published (Online):27.03.2022

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To cited: Aslan A.. Osteoporosis and Fragility Fractures: An Overview. Acta Med. Alanya 2022;6(1):1-2
doi:10.30565/medalanya.1076252

Osteoporosis (OP); It is a metabolic bone disease characterized by decreased bone mineral density (BMD) and bone strength, increased bone fragility and fracture risk, and deterioration in the microarchitecture of bone tissue. Osteoporosis is an important public health problem that increases with age and causes morbidity and mortality. The most important cause of morbidity and mortality in OP are fragility fractures such as osteoporotic hip fractures [1-4]. The diagnosis of osteoporosis is defined by double X-ray absorptiometry (DXA)-derived BMD that is below ≤ 2.5 standard deviations (SD) which is the mean of a young, healthy reference population.

Age-related reduction in BMD increases the risk of fractures seen in advanced age [3- 5]. BMD values are affected by regional factors such as ethnicity, genetics, gender, age, environment, and exposure to sunlight, and it has been reported that the BMD values of the Turkish population are lower than the reference values in various DXA devices and the prevalence of osteoporosis is higher [1,2]. At the same time, the risk of osteoporotic fractures in the Turkish population has also increased significantly [3].

A web-based logarithmic table, called FRAX®, which is used to calculate osteoporotic fracture

risk, has been developed. The result that is obtained, shows the 10-year probability of having a hip fracture and a major osteoporotic fracture. It is stated that the history of major osteoporotic fracture, advanced age and low t-score are the most important risk factors. However, there are concerns that the Frax® Turkey model should be revised [3].

Prevention and treatment of osteoporosis can prevent hip fractures and comorbidities [6]. It is important to use pharmacological and non-pharmacological methods in the prevention and treatment of osteoporotic fractures. Interventions such as resistance training, optimal dietary protein, vitamin D and calcium intake have positive effects on bone and muscle, reducing falls, fractures and therefore disability [7]. Pharmacologically, there is a wide range of drug groups, including antiresorptive and anabolic agents. Antiresorptive drugs such as bisphosphonates and the RANKL inhibitor denosumab are currently the most widely used osteoporosis drugs [5]. The choice of medical treatment in osteoporosis is decided according to bone mineral density and personal risk factors. Bisphosphonates, which are antiresorptive, are drugs with proven efficacy in reducing the risk of OP hip fracture [6,8]. Bisphosphonates used in the treatment of OP are available in oral or parenteral forms. Various studies have reported varying efficacy and side-effect rates [4]. Oral and parenteral bisphosphonates are effective in the treatment of postmenopausal OP. Of the oral bisphosphonates, however, Aledronate appears to be most effective [4,9]. Recently, anabolic therapy with teriparatide has been shown to be superior to the bisphosphonate risedronate in preventing vertebral and clinical fractures in postmenopausal women. Treatment with the sclerostin antibody romosozumab increases BMD more deeply and rapidly than alendronate [5]. On the other hand, when patient compliance and regular use are taken into account, parenteral bisphosphonates may be more effective in terms of mean improvement in BMD values [4]. In addition, parenteral agents can be preferred in the treatment of osteoporosis in patients with co-morbidities, who use multiple drug therapy, or who have difficulty in using oral drug therapy. However, it should always be kept in mind that drug-related side effects may be seen more frequently with parenteral agents [8].

On the other hand, there are some concerns about the effect of BPs on the fracture healing process. However, it has been reported that the correct timing of ZoIA administration in elderly patients with hip fractures has no effect on fracture healing and incidence of complications [6]. Research on the treatment of OP continues. It has been reported that Ramelteon, a peripheral melatonin agonist, can be used to prevent osteoporosis [10]. Unfortunately, fragility fractures still cannot be properly treated [7]. Despite the proven efficacy and safety of antiresorptive drugs used in OP, few patients at high risk of fracture receive treatment [5,7]. The aging of the population in the world and in our country and the increase in health care costs make OP even more important. In the future, the focus should be on the prevention and treatment of OP, as well as the application of multidisciplinary care models to prevent osteoporotic fractures.

Conflict of Interest: No conflict of interest was declared by the author.

Funding sources: The author declared that this article received no financial support.

ORCID and Author contribution: AA (0000-0001-5797-1287): Literature search, writing, critical review.

REFERENCES

- Aslan A, Karakoyun O, Güler E, Aydın S, Gök MV, Akkurt S. Kastamonu'da yaşayan Türk kadınlarında kemik mineral yoğunluğu, osteoporoz yaygınlığı ve bölgesel risk faktörlerinin değerlendirilmesi: KASTÜRKOS çalışması. *Eklemler Hastalıkları Cerrahisi*. 2012;23(2):62-7. Turkish. PMID: 22765482.
- Aslan A, Uysal E, Karakoyun Ö. Kastamonu ve Yöresi Türk Toplumunu Kadınlarında Kemik Mineral Yoğunluğu Değerleri. *J Clin Anal Med*, 2013;4(3):209-12. doi: 10.4328/JCAM.1022
- Aslan A, Konya MN, Yağcı Ş, Karakoyun Ö. FRAX® Türkiye modeli yeterli mi? Türk Toplumunda FRAX® ile osteoporotik kırık riski analizi. *Türk J Osteoporosis*, 2014; 20(1):21-5. doi: 10.4274/tod.28247
- Aslan A, Gülcü A, Özmeriç A, Yaşlı Postmenopozal Osteoporozlu Hastalarda Tedavi Sonuçlarımız: Oral ve Parenteral Bisfosfonatların Karşılaştırılması. *Türk Osteoporoz Dergisi*, 2018;24(2):53-58. doi:10.4274/tod.73645
- Lorentzon M. Treating osteoporosis to prevent fractures: current concepts and future developments. *J Intern Med*. 2019 Apr;285(4):381-394. doi: 10.1111/joim.12873. PMID: 30657216.
- Sargin S, Konya MN, Gulcu A, Aslan A. Effects of Zoledronic Acid Treatment on Fracture Healing, Morbidity and Mortality in Elderly Patients with Osteoporotic Hip Fractures. *Strategies Trauma Limb Reconstr*. 2019;14(3):126-131. doi: 10.5005/jp-journals-10080-1439. PMID: 32742427.
- Atik OŞ, Aslan A, Odluyurt M. Are fragility fractures being treated properly? *Jt Dis Relat Surg*. 2020;31(2):403-404. doi: 10.5606/ehc.2020.57894. PMID: 32584746.
- Aslan A, Özmeriç A, Bilal Ö, Doğan F, Özkaya Z and Uysal E. Comparative evaluation of clinical effectivity and side effects of two different parenteral agents used in the treatment of osteoporosis. *J Rheumatol Orthop*. 2014; 1:1. <http://dx.doi.org/10.7243/2055-7000-1-1>
- Aslan A, Sargin S, Özmeriç A, Yağcı Ş. Treatments of patients with postmenopausal osteoporosis: A comparative study. *OA Musculoskeletal Medicine* 2014 Feb 01;2(1):4.
- Köse D, Köse A, Halıcı Z, Gürbüz MA, Maman A, Yayla M. Ramelteon used to treat insomnia can reduce the occurrence of osteoporosis. *Acta Med. Alanya* 2021;5(2): 164-170 doi:10.30565/medalanya.939161