Editorial

Osteoporosis

Natthinee Charatcharoenwitthaya

Osteoporosis is a common skeletal disorder characterized by low bone mass and microarchitectural deterioration, resulting in decreased bone strength and increased risk of fragility fracture.[1,2,3,4] Over 200 million people worldwide have osteoporosis, and 8.9 million new osteoporotic fractures occur annually.[5] The incidence will increase with the aging population.

Bone loss and deterioration of bone microarchitecture occur silently and progressively. Therefore, most patients have no symptoms until the first fracture occurs.[1, 2, 3] The fracture causes pain, loss of function, increased mortality (hip and vertebral fracture), increased subsequent fracture risk, and a burden on family members and national health economies.[1, 2, 3, 4, 5] Although the availability of osteoporosis medications effectively reduces fracture risk, only a small proportion of patients at high fracture risk have been evaluated and treated.[1, 2, 3]

The development of the country-specific Fracture Risk Assessment Tool (FRAX) increases osteoporosis screening feasibility, even in the primary care setting. FRAX is a computer-based algorithm that calculates the 10-year probability of hip fracture and major osteoporotic fractures (hip, clinical spine, humerus, or wrist fracture) for untreated patients aged 40-90 years. It estimates the fracture risk by using easily obtained clinical risk factors including age, gender, body weight, height, previous fracture, parent fractured hip, current smoking, glucocorticoid use, rheumatoid arthritis, secondary osteoporosis, and excessive use of alcohol. FRAX that combines the clinical risk factors with femoral neck bone mineral density (BMD) leads to a more accurate fracture risk assessment.[2, 3] Several guidelines[2, 3, 4], including Thai[4], recommend using the FRAX score for the diagnosis and an intervention threshold for osteoporosis treatment.

The diagnostic criteria for osteoporosis include one of the followings

- Low-trauma spine or hip fracture (regardless of BMD)
- BMD T-score $\leq$ -2.5 in the lumbar spine, femoral neck, total hip, or 1/3 radius
- High country-specific FRAX score

The management of osteoporosis consists of lifestyle measures and pharmacological therapy. The bone-healthy lifestyle includes an adequate intake of calcium and vitamin D, regular weight-bearing and balance-training exercise, stop smoking, avoiding excessive use of alcohol, and fall prevention.[1, 2, 3, 4]

Department of Internal Medicine, Faculty of Medicine, Thammasat University

Falls are common among older people and are the precipitating cause of osteoporotic fractures. Approximately one in three individuals aged 65 or older will fall at least once a year[6], and the risk of falling increases with age. Therefore, the effective fall prevention program is essential for preventing osteoporotic fractures in the elderly, especially among osteoporosis patients.

The Thai Osteoporosis Foundation (TOPF) position statement on the management of osteoporosis[4] recommends pharmacological therapy in one of the followings

- Low-trauma spine or hip fracture

- BMD T-score ≤ -2.5 in the lumbar spine, femoral neck, total hip, or 1/3 radius in women ≥ 65 years or men ≥ 70 years

- High FRAX score (Thai-reference): a 10-year probability of hip fracture ≥ 3% or a 10-year probability of major osteoporotic fractures ≥ 20%

There is no specific recommendation for the first-line drug. Osteoporosis medication selection should be individualized and based on drug efficacy, potential adverse effects, comorbidities, the severity of osteoporosis, patient preference, and the Thai health-economic viewpoint.

In summary, osteoporosis is a silent skeletal disorder that potentially causes health and economic burdens. The availability of FRAX and effective osteoporosis medications make osteoporotic fractures preventable and treatable. The effective fall prevention program is essential for preventing osteoporotic fractures among the elderly and osteoporosis patients.

References

1. Compston JE, McClung MR, Leslie WD. Osteoporosis. *Lancet*. 2019;393:364-376.
2. Camacho PM, Petak SM, Binkley N, Diab DL, Eldeiry LS, Farooki A, et al. American Association of Clinical Endocrinologists / American College of Endocrinology clinical practice guidelines for the diagnosis and treatment of postmenopausal osteoporosis. *Endocr Prac*. 2020;26(Suppl 1): 1-46.
3. Kanis JA, Cooper C, Rizzoli R, Reginster JY. European guidance for the diagnosis and management of osteoporosis in postmenopausal women. *Osteoporos Int*. 2019;30:3-44.
4. Songpatanasilp T, Sritara C, Kittisomprayoonkul W, Chaiumnuay S, Nimitphong H, Charatcharoenwitthaya N, et al. Thai Osteoporosis Foundation (TOPF) position statements on management of osteoporosis. *Osteoporosis and Sarcopenia*. 2016;2:191-207.
5. Pisani P, Renna MD, Conversano F, Casciaro E, Di Paola M, Quarta E, et al. Major osteoporotic fragility fractures: Risk factor updates and societal impact. *World J Orthop*. 2016;7:171-181.
6. Lord SR, Ward JA, Williams P, Anstey KJ. An epidemiological study of falls in older community-dwelling women: the Randwick falls and fractures study. *Aust J Public Health*. 1993;17: 240-245.