



On the occasion of world osteoporosis day 2018; osteoporosis in young individuals

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Introduction

Osteoporosis is one of the progressive diseases in the world that affects bone density and increases the chance of fracture in such people. It is estimated that because of osteoporosis more than eight million bone fractures happen per year in the world. The rate of persons who have this disease increases with older ages, however in recent years osteoporosis in youth became prevalent (1-3).

Predisposing factors of osteoporosis

Nowadays many etiologies have been identified for osteoporosis such as vitamin D deficiency, malnutrition, tobacco, smoking, inactivity and other endocrine such as hypogonadism, hypoparathyroidism, adrenal insufficiency also consumption of some drugs like steroids, aromatase inhibitors, chronic renal failure (chronic kidney disease), hemodialysis, proton pump inhibitors (PPI). All of underlying causes of osteoporosis, eventually lead to an imbalance between bone resorption and its formation. In this disease, resorption of bone and the increased activity of osteoclast cells result in a lower bone mass and activity of osteoblast cells which cannot rebuild as much as the proportion of bone destruction caused by osteoclast cells. This condition will lead to lower bone density in both trabecular and cortical parts of the bone. In addition, when the weak bone breaks, these cells cannot remodel the fractured bone compare to its quality of before of fracture. Micro-fractures in these bones have seen more in some area like vertebral, wrist and hip. In the x-ray imaging of such area with osteoporosis, micro-fractures, and thinner cortical bone density and also its trabecular mass is detectable (2-7).

Osteoporosis has not necessarily specific signs and symptoms. The disease is progressive, and its risk factors increased over the recent years. Fracture of bones specially vertebral and hip bones are very common and even can cause back pain, spinal cord compression and cauda equina syndrome in some people. For diagnosis of this disease, some method like measuring of bone mineral density with dual-energy x-ray or quantitative computed tomography was suggested. For management of osteoporosis change of life style with using weight bearing sports and consumption of bisphosphonates and

■ Implication for health policy/practice/research/medical education

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antioxidants are very beneficial modalities for lowering the severity of disease (1-5).

For evaluation of bone density in young persons, clinical densitometry has been suggested by the use of Z score for the definition of "low bone mass". Bone density is increased until the year 30, then bone mass will slowly start to diminish. Hence, it is better to use Z score instead of T score that compares bone density to peak bone density. It is interesting to note that in young persons, no established relationship between loss in bone density and risk of bone fractures was seen. Additionally, using prediction tools like FRAX is not considered as a valid tool. More evaluation about detection of osteoporosis in young person showed that using DXA-based vertebral fracture assessment (VFA) is more applicable for assessment of this disease, especially in young persons that have not the major trauma for fracture in their vertebral bones (2-7).

In young persons, endocrine system, intestinal and bone organs have a better function than geriatrics; thus, the rate of osteoporosis is low compared to older ages. We used T score between than -1 to -2.5 and below than -2.5 respectively for osteopenia and osteoporosis, for normal person and without any underlying disorders for normal persons. However, those who have the increased risk of osteoporosis and low bone density like type 1 diabetes, inflammatory bowel disease (IBD), cystic fibrosis, anorexia nervosa, the prevalence of osteoporosis can be higher than 15% and even more. It should be remembered that some exceptions such as normal persons who have vitamin D deficiency and osteomalacia and individuals

with small body size may exist (1-4).

Evaluation of osteoporosis

As mention above, young persons with low bone density with using DXA and VFA should evaluate for detection of underlying disorders that decreases bone density. These evaluations may include common diseases like vitamin D deficiency, diabetes, mineral deficiency, renal failure, hepatic and gastric evaluation specially IBD and also Celiac disease. If such laboratory tests and these general assessments failed to find underlying disease of osteoporosis, next step can be measuring of bone turnover markers like procollagen peptides such as procollagen I aminoterminal propeptide (PINP) and procollagen I carboxyterminal propeptide (PICP) (markers for bone formation) and deoxypyridinoline for bone destruction process. There are many kinds of diseases affecting proportion of bone turnover markers (3-9).

Level of bone turnover markers can correlate with other factors like insulin-like growth factor 1 (IGF-1), physical activity and many other diseases like connective tissue and storage disorders. However, the level of bone turnover markers can be higher, lower and even in normal range in this kind of diseases. But when abnormal level of bone turnover marker detected in clinical evaluation, further assessment is necessary to conduct (4-9).

Conclusion

World osteoporosis day with the theme of “love your bones” can be a good platform for alarming osteoporosis throughout the world, to better finding its predisposing factors, particularly in youth.

Authors' contribution

MAN and AN wrote the manuscript equally.

Conflicts of interest

The authors declare no conflicting interest.

Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

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