

Osteoporosis: A Silent Killer

Firdous Jahan*

Chair Family Medicine Department, Oman Medical College Sohar, Sultanate of Oman, Oman

Introduction

Osteoporosis is a skeletal disorder in which the density and quality of bones are reduced, leading to weakness of the skeleton and increased risk of fracture, particularly of the spine, wrist and hip. This disease often occurs silently without symptom and the first symptom is a fracture, which is an important cause of mortality and morbidity [1]. Several risk factors are associated with osteoporosis, some are modifiable and some are non-modifiable. Non modifiable risk factors include female sex, old age, small thin built, Caucasian/Asian origin, and family history of osteoporosis. Important modifiable factors are calcium and vitamin D deficiency, sedentary lifestyle, smoking, excessive alcohol intake, and caffeine intake.

Medical conditions like Chronic kidney disease and liver disease, hypogonadism, thyrotoxicosis, malabsorption syndrome, anorexia nervosa, Cushing syndrome, eating disorders, taking corticosteroid medications (prednisone, methylprednisolone) every day for more than 3 months, or taking some anti-seizure drugs, hyperparathyroidism, and inflammatory conditions like rheumatoid arthritis, have a greater than average risk of developing osteoporosis [2]. Osteoporosis is a global problem experienced by 10 million adults, and is increasing in significance as the population of the world both grows and ages. The ratio between female and male is 4:1. According to International Osteoporosis Foundation about 30-50% female and 15-30% male are at risk of osteoporotic fracture during their life time [3].

Working Group of the WHO established an operational definition of osteoporosis based on bone mineral density (BMD). Osteoporosis is defined as a BMD 2.5 SD or more below the average value for premenopausal women. Normal BMD is defined as T score of -1.0 or higher and a T score between -1.0 and -2.5 is defined as osteopenia or low bone mass. A history of fragility fractures in the absence of other metabolic bone disorders also defines osteoporosis. According to the World Health Organization Health Report 70 million people worldwide are diagnosed to have osteoporosis, and 50% of them have the estimated lifetime risk of osteoporotic fracture, especially in white and Asian women. The incidence of osteoporosis in women at the age of 50 years is 1 in 3 and this increases to 1 in 2 when they approach the age of 60, in male 1 out of 5 are osteoporotic at the age of 50 and this incidence increases to 1 in 3 [4]. Highest risk of osteoporotic hip fracture is in Norway, Sweden, Iceland, Denmark, and USA. Risk of hip fracture is steadily increasing in Asia, 1 out of 4 hip fracture occur in Asia and Latin America, and this ratio will increase to 1 in 2 by 2050 [5]. Burden of osteoporosis is also increasing in Middle East. According to the International Institute of Health Osteoporosis and related Bone Diseases 2004 the annual incidence of osteoporosis is more than the combined incidence of heart attack or breast cancer in women. It is estimated that the lifetime risk of experiencing an osteoporotic fracture in men over the age of 50 is 30%, similar to the lifetime risk of developing prostate cancer.

Osteoporosis, a silent public health problem evident often when fractures have occurred. In adults early recognition and appropriate treatment can reduce fracture risk. The Fracture Risk Assessment Tool (FRAX) tool has been developed by WHO to evaluate fracture risk of patients. It is based on individual patient models that integrate the risks associated with clinical risk factors as well as bone mineral density (BMD) at the femoral neck [6].

People at greatest risk of osteoporotic fractures are identified through the measurement of bone mineral density (BMD) preferably by means of dual-energy x-ray absorptiometry (DEXA). DEXA testing is a gold standard for diagnosis, recommended in high-risk groups not for general population. Quantitative ultrasound (QUS) measurement relatively inexpensive and portable is used to measure peripheral skeleton osteoporosis and osteopenia. QUS can be performed quickly and involves less radiation, and this could be an ideal tool to screen for osteoporosis at the community level. The Fracture Risk Assessment Tool (FRAX) is a simple way to estimate bone-fracture risk given by World Health Organization (WHO) gives the 10-year probability of fracture. The output is a 10-year probability of hip fracture and the 10-year probability of a major osteoporotic fracture (clinical spine, forearm, hip or shoulder fracture) [7-8]. As osteoporosis is a public health problem associated with morbidity and socio-economic burden worldwide. Evidence have shown that by managing the modifiable risk factors associated with osteoporosis we can prevent and delay the process of osteopenia and osteoporosis in advancing age and we can pick up population at risk at an early age so that preventive measures can be taken and health education can be given to target population [9]. The gold standard for measuring bone density however is the Dual energy X-ray absorptiometry (DEXA) but it is expensive and not advisable as a screening tool. So we must develop clinical tools to assess clinically the patients who are at greater risk of developing osteoporosis [10].

A case control interview based study was conducted in India on postmenopausal women which showed that the family history of fracture, weight of the women <60 kg, height <155 cm were significant risk factors for osteoporosis and regular consumption of milk, almonds, fruits as protective factors [11-12]. A similar interview based study that was conducted on patients who were admitted to the hospital with hip fracture from north Indian urban population gave the following results; calcium intake, increased body mass index (BMI) and higher activity levels had a significant protective effect on hip fracture. On the other hand excessive caffeine intake and decreased physical activity were associated with increased risk of hip fracture [13-14].

Osteoporosis is called the "silent disease" as this problem has no symptoms. Often it presents as broken bone. Patients with osteoporosis develop fractures or vertebra to collapse without any alarming symptom. Only nonspecific symptom may be severe backache, or spinal deformity such as kyphosis, or severely stooped posture [15-16].

Osteoporosis is relatively develops less often in men than women because bone loss starts later and progresses more slowly in men.

*Corresponding author: Firdous Jahan, Associate Professor/Chair Family Medicine Department, Oman Medical College Sohar, Sultanate of Oman, Oman, Tel: 968 26844004; E-mail: firdous@omc.edu.om

Received September 10, 2015; Accepted September 14, 2015; Published September 19, 2015

Citation: Jahan F (2015) Osteoporosis: A Silent Killer. J Women's Health Care 4: 260. doi:10.4172/2167-0420.1000260

Copyright: © 2015 Jahan F. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Slow remodeling also contribute to the lower rate of fractures in men, however men generally have higher rates of fracture related mortality [17-18]. Vertebral fractures may cause equal morbidity in men and women but hip fractures in men cause significant morbidity and loss of normal functioning [19-21].

Average age of world's population is shifting upward, thus increasing the incidence and prevalence, and burden of osteoporosis. It is a global problem affecting both women and men. The general prevalence of osteoporosis rises from 5% among women aged 50 years to 50% at 85 years of age; among men, the comparable figures are 2.4% and 20%. The annual incidence rate of osteoporotic fractures in women is greater than the combined incidence rates of heart attack, stroke and breast cancer [22-23].

The incidence of osteoporotic hip fracture is steadily increasing in the developed as well as developing countries [24-26]. Lifestyle prevention of osteoporosis is in many aspects the inverse of the potentially modifiable risk factors. As tobacco smoking and calcium/vitamin D deficiency have been linked with osteoporosis, smoking cessation and high calcium vitamin D intake are commonly recommended as ways to help prevent it [27].

Conclusion

Since osteoporosis affects the elderly population which is growing, it will put a bigger burden to the healthcare system as treatment is expensive however, is a highly preventable and treatable disease. Osteoporosis also results in huge indirect costs that are rarely calculated. Prevention of osteoporosis includes a proper diet during childhood and efforts to avoid medications that cause the condition. Efforts to prevent broken bones in those with osteoporosis include a good diet, exercise, and fall prevention.

References

- WHO Summary Meeting Report Brussels, Belgium (2004).
- Kanis JA, Johnell O, De Laet C (2004) A meta-analysis of previous fracture and subsequent fracture risk. *Bone* 35: 375-382.
- International Osteoporosis Foundation (IOF).
- Tosteson AN, Melton LJ, Dawson Hughes B (2008) Cost-effective osteoporosis treatment thresholds: the United States perspective. *Osteoporosis* 19: 437-447.
- Kanis JA, Johnell O, Oden A, De Laet C, Jonsson B, et al. (2002) Ten-year risk of osteoporotic fracture and the effect of risk factors on screening strategies 30: 251-258.
- Leib ES, Saag KG, Adachi JD (2011) Official Positions for FRAX® clinical regarding glucocorticoids: the impact of the use of glucocorticoids on the estimate by FRAX® of the 10 year risk of fracture from Joint Official Positions Development Conference of the International Society for Clinical Densitometry and International Osteoporosis Foundation on FRAX®. *J Clin Densitom* 14: 212-219.
- Cadarette SM, Jaglal SB, Kreiger N, McIsaac WJ, Darlington GA, et al. (2000) Development and validation of the Osteoporosis Risk Assessment Instrument to facilitate selection of women for bone densitometry. *Canadian Medical Association Journal* 162: 1289-1294.
- Burge R, Dawson Hughes B, Solomon DH, Wong JB, King A, et al. (2007) Incidence and economic burden of osteoporosis-related fractures in the United States. *J Bone Miner Res* 22: 465-475.
- Kanis JA (2002) Diagnosis of osteoporosis and assessment of fracture risk. *Lancet* 359: 1929-1936.
- Cummings SR, Cawthon PM, Ensrud KE et al. (2006) BMD and risk of hip and non-vertebral fractures in older men: a prospective study and comparison with older women. *J Bone Miner Res* 21: 1550-1556.
- Keramat A, Patwardhan B, Larijani B, Chopra A, Mithal A, et al. (2008) The assessment of osteoporosis risk factors in Iranian women compared with Indian women. *BMC Musculoskeletal Disorders* 9: 28.
- Cranney A, Jamal SA, Tsang JF, Josse RG, Leslie WD (2007) Low bone mineral density and fracture burden in postmenopausal women. *CMAJ* 177: 575-580.
- Jha R, Mithal A (2005) Pilot case control investigation of risk factors for hip fractures in the urban Indian population. 2nd Joint Meeting of the European Calcified Tissue Society and the International Bone and Mineral Society, Geneva: 25-29.
- Hernandez R R, Martinez G S (2004) Osteoporosis related life habits and knowledge about osteoporosis among women in El Salvador: a cross-sectional study. *BMC Musculoskeletal Disorder* 26: 5-29.
- Sultan A, Khan D A, Mushtaq M, Hassan MU (2006) Frequency of osteoporosis and its associated risk factors in postmenopausal women in clinical practice at Rawalpindi. *Pakistan Journal of Pathology* 17: 115-118.
- Schuit SC, Van Der Klift M, Weel AE (2004) Fracture incidence and association with bone mineral density in elderly men and women: the Rotterdam Study. *Bone* 34: 195-202.
- Koh L, Ben Sedrine W, Torralba T, Kung A, Fujiwara S (2001) A simple tool to identify Asian women at increased risk of osteoporosis. *Osteoporosis International* 12: 699-705.
- Kanis JA, Borgstrom F, De Laet C, Johansson H, Johnell O, et al (2005). Assessment of fracture risk. *Osteoporosis International* 16: 581-589.
- Keramat A, Mithal A (2005) Risk factors for osteoporosis in urban Asian Indian women presenting for a preventive health checkup. 2nd Joint Meeting of the European Calcified Tissue Society and the International Bone and Mineral Society, Geneva: 25-29.
- Kanis JA, Johnell O, Oden A, Jonsson B, De Laet C, et al. (2000) Risk of hip fracture according to the World Health Organization criteria for osteopenia and osteoporosis. *Bone* 27: 585-590.
- Riaz S, Alam M, Umer M (2006) Frequency of osteomalacia in elderly patients with hip fractures. *J Pak Med Assoc*, 56: 273-276.
- Lauderdale DS, Kuohung V, Chang SL (2003) Identifying older Chinese immigrants at high risk for osteoporosis. *J Gen Intern Med* 18: 508-515.
- Riaz M, Abid N, Patel J (2008) Knowledge about osteoporosis among healthy women attending a tertiary care hospital. *J Pak Med Assoc* 58: 190-194.
- Habiba U, Ahmed S, Hassan L (2002) Predisposition to osteoporosis in postmenopausal women. *Journal of College of Physicians and Surgeons Pakistan* 12: 297-301.
- Lowe N, Bano Q, Bangash S A (2008) Dietary calcium intake and bone health in postmenopausal women in Nahaqi, North West Frontier Province, Pakistan. *Proceedings of the Nutrition Society* 67: OCE8, E369.
- Frost ML, Blake GM, Fogelman I (2000) Can the WHO criteria for diagnosing osteoporosis be applied to calcaneal quantitative ultrasound? *Osteoporosis Int* 11: 321-330.
- Nelson HD, Helfand M, Woolf SH, Allan JD (2002) Screening for postmenopausal osteoporosis: a review of the evidence for the U.S. Preventive Services Task Force. *Ann Intern Med* 137: 529-541.