



CHAPTER II

LITERATURE REVIEW

MULTIPLE RISK FACTORS FOR OSTEOPOROSIS AND HIP FRACTURE

There is emerging consensus that osteoporosis is a heterogeneous disorder with multiple causes. Aging, sex, race, alcohol drinking, smoking, low dietary calcium intake, leanness and inactivity are most common risk factors for osteoporosis (3, 36).

Bone loss begins in the fourth or fifth decades of life and the risk of fracture related osteoporosis sharply increases after 45 years old (1, 2). Bone formation and bone resorption occur at anatomically discrete foccicalled bone remodelling units. After peaking in young adulthood, bone mass begins to decline with advancing age.

Studies based on medical records show that age-specific incidence rates for hip fracture are two or three times higher in women than in men (3). Researches suggested that bone loss is proportionately greater in women than men (10), in part because a period of accelerated bone loss accompanying menopause is superimposed upon the underlying age-related bone loss in women.

Osteoporosis is rare in blacks and Mexican-Americans. Thus, a clear risk factor is Caucasian race and Asians are probably also at risk. Blacks have a higher bone mass at maturity than Caucasians, and it is likely that this is also true for

Mexican-Americans (36).

Alcoholics have less bone than controls (23, 37) and some alcoholics have severe osteoporosis without other apparent causes (37). Alcoholics are also more likely to experience falling which is a important risk factor for hip fracture.

Some studies (12, 20, 38, 39) but not all (19) showed the evidence that smokers are more prone to osteoporosis as well as to hip fracture.

It has been widely held that osteoporosis is more common in patients whose dietary calcium intake is low, although there is now some question as to whether increasing dietary calcium intake necessarily increases bone mass or decreases rates of bone loss (40, 41).

Osteoporosis is more common in the thin than it is in the obese (11, 12, 13, 38).

Physical exercise is associated with relative increase in bone mass while prolonged immobility results in osteoporosis (27, 28). There is evidence that regular exercise can effectively reduce the risk of osteoporotic fractures in both sexes (20).

OSTEOPOROTIC HIP FRACTURE AND FALLING

Hip fracture is the most serious consequence of osteoporosis while falling is an important risk factor for hip fracture. Over 90 percent of hip fracture are the result of minimal trauma, mainly falling, but in the elderly, most falls

are not associated with fractures (31). Are those patients with hip fracture more osteoporotic? Previous studies (6) showed controversial results. But those studies failed to select subjects from the same source resulted from falling, which is a critical confounding factor.

THE MEASUREMENT OF BMD

To assess the measurement of bone mass in the proximal femur (42) dual energy X-ray absorptiometry (DEXA) has sensitivity 75% and specificity 69% for fracture threshold of 0.57 g/cm² (BMD in hip), and, sensitivity 90% and specificity 28% for fracture threshold of 0.63 g/cm² (BMD in hip), which is slightly more accurate and precise than the more common single energy technique (36). Femoral BMD is still the best choice for diagnosing femoral osteoporosis (43).

Few studies have compared Singh Index (32), which has been practised more than twenty years in the clinic, with DEXA in measuring BMD of the proximal femur. The clinical value of Singh Index has been argued (33).

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