PREVALENCE AND RISK FACTORS OF OSTEOPOROSIS AMONG THAI MALE PATIENTS AT GERIATRIC CLINIC, KING CHULALONGKORN MEMORIAL HOSPITAL

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OBJECTIVE To study the prevalence and determine risk factors of osteoporosis in elderly Thai men.

STUDY DESIGN Prospective ,descriptive study.

STUDY METHOD Forty healthy Thai men 60 years and older who do not take any medication that effect bone mass were recruited in this study . These volunteers were asked to answer questionaire about risk factors causing low bone mass . Bone mineral density of the lumbar spines and non-dominant proximal hip were measured by Dual Energy X-ray Absorptiometer.

RESULTS According to WHO diagnostic criteria ,the prevalence of osteoporosis of lumbar spines and femoral neck was 37.5 percent and 12.5 percent respectively by using cutoff value from the American 's cutoff value and was 35 percent and 52.5 percent respectively when using Thai's cutoff value.None of risk factors correlated with osteoporosis.

CONCLUSION In Thailand ,up until the time of this report, there are no reliable data concerning prevalence of osteoporosis in men.The results of this study,initiate the emerging recognition of the impact of osteoporosis in Thai men.Further study in large population is encouraged to determine the actual prevalence and risk factors of osteoporosis in Thai men .Role of Thai health government in the prevention of osteoporosis in men is essentials because osteoporosis may be a huge problem in the future due to change in Thai life style and longer life time expectancy.

KEY WORD : Bone mineral density ,BMD ,osteoporosis , Thai men ,DEXA,prevalence ,risk factor

Although it has been generally accepted that osteoporosis is common in women,only recent studies reported that it is also widespread in men.[1-3] It is now recognized that one in twelve men in Western countries have osteoporosis .Thirty percent of all hip fractures occurred in men and the burden accounts for at least one quarter of the total £1 billion was spent for osteoporosis by the National Health Service in the United Kingdom.[4] In the United States, the incidence of hip fracture in men older than 65 years is 4-5/1000 and in similar aged women is 8-10 /1000.[5]

In Europe, the death rate of femoral fracture neck in elderly men is approximately equal to women, therefore morbidity and mortality after osteoporotic fractures appear to be serious in men the same as in

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women.[6]

Bone mineral density (BMD) is the most easily measured and accurate predictor of fracture risks.For any individual ,BMD is the combination of bone formation and subsequent bone loss,both of which are influenced by genetic,hormonal and environmental factors.[7]

The objective of this preliminary study was to assess the prevalence of osteoporosis in Thai men, age 60 years and older, by measurement of bone mineral density and determine clinical and risk factors of osteoporosis. The risk factors assessment may be useful in places where bone densitometer are not available.

MATERIALS AND METHODS

Forty Thai men were recruited for the study.The inclusion and exclusion criteria for selection of studied subjects were as follows.

Inclusion criteria

1. Thai men age 60 years and older who were born and live in Thailand at least 20 years.

Exclusion criteria

1. History of prolonged bed rest (over 4 weeks)
2. History of calcium,vitamin D supplement
3. History of sex hormone replacement therapy
4. History of medications that may affect bone density such as steroid, thyroxine
5. Presence of chronic illness including thyroid disease and hyperparathyroidism
6. History of X-ray contrast media administration or radionuclide study one week prior to present study

All subjects were asked to answer the questionnaire concerning risk factors of bone loss. Bone mass was measured in each subjects utilizing dual energy X-ray absorptiometer (Hologic Delphi). Long term precision of the equipment is about 1%. The measurement included anterior lumbar spines (L1-L4) and non-dominant proximal hip.Results were expressed in grams of ashed bone per unit area of scanned bone(gram per square centimeter, g/cm^2).

According to WHO criteria ,osteoporosis is diagnosed when the value of the BMD is more than 2.5 standard deviation below the young adult mean and osteopenia is diagnosed when the value of BMD is between 1.0 standard deviation to 2.5 standard deviation below the mean.[8] In this study ,we compared the prevalence of osteoporosis and osteopenia using two different cutoff values.The first cutoff value is from the bone mineral density databases for American men.[9] The second cutoff value is from the bone mineral density database for Thai men . The mean of peak bone mass of Thai men at lumbar spines and femoral neck is 1.030 ± 0.081 g/cm^2 and 0.973 ± 0.097 g/cm^2 respectively.[10]

Descriptive statistics were used when it was appropriated to compare qualitative data, chi-square. P–valued of less than 0.05 is considered statistically significant.

This study protocol was approved by Ethics Committee of the Faculty of Medicine,Chulalongkorn University,Bangkok,Thailand.

RESULTS

Forty men were enrolled to the study. The mean ages of subjects was 68.85 years with the age ranges of the studied population was 60-80 year old.The mean BMI of subjects was 24.19 kg/m^2 (range between 18-32 kg/m^2)

The proportion of osteoporosis and osteopenia of the studied men were shown in Table1. The study revealed 37.5 and 12.5 percent had osteoporosis at lumbar spines and femoral neck respectively by using American's cutoff value.Thirty

five and 52.5 percent had osteoporosis at lumbar spines and femoral neck respectively by using Thai's cutoff value (Table 2). Therefore the prevalence of osteoporosis of lumbar spines by using Thai's and American's cutoff values were similarly. But prevalence of osteoporosis of femoral neck by using Thai 's cutoff value was more much than using American's cutoff value.

TABLE 1. Bone mineral density of lumbar spines and femoral neck in elderly Thai men (n= 40) using American's cutoff value

	BMD					
Measurement sites	Normal		Osteopenia		Osteoporosis	
	No	%	No.	%	No.	%
1. Anterior lumbar spines (L1-L4)	15	37.5	10	25	15	37.5
2. Femoral neck	12	30	23	57.5	5	12.5

TABLE 2. Bone mineral density of lumbar spines and femoral neck in elderly Thai men (n= 40) using ***Thai' s cutoff value***

	BMD					
Measurement sites	Normal		Osteopenia		Osteoporosis	
	No.	%	No.	%	No.	%
1. Anterior lumbar spines (L1-L4)	15	37.5	11	27.5	14	35
2. Femoral neck	4	10	15	37.5	21	52.5

When compared the factors associated with osteoporosis to studied men. Osteoporosis in this study did not show correlation with history of insufficient calcium intake ,alcohol consumption , tobacco smoking , non-exercise and low body mass index (BMI) .

DISCUSSION

A large study which conducted in the US,the Third National Health and Nutrition Examination Survey (NHANES III),estimated that 1-4% of men have osteoporosis and 15-33% have osteopenia

based on World Health Organization criteria for BMD measurement at the femoral neck level.[11]

Our study ,the results revealed lower prevalence of osteoporosis of femoral neck when using American's cut off value than Thai's cut off value.But similarly prevalence of osteoporosis and osteopenia of lumbar spines when using Thai's and American's cutoff value.

Using American's cutoff value and Thai 's cutoff value ,the prevalence of osteoporosis of lumbar spines and femoral neck in this preliminary study was high. The result of this study emerging recognition of the impact of osteoporosis in Thai men.

At present ,screening of osteoporosis by BMD can not be justified and facilities for bone densitometer remain restricted to few centers.Another possible approach to early detection of osteoporosis is the use of clinical and historical risk factors to predict bone mass.

Tobacco was linked to an increased prevalence of vertebral fractures in men in cohort studies of Seeman and Melton in which the relative risk of vertebral fracture in smokers was 2.3.[12] Prolonged abuse of alcohol is also deterimental to skeletal integrity in men has only recently been recognized. [13-15] Recent studies suggested that ethanol also exerts toxic effects directly at the cellular level in bone.Ethanol induces a dose-dependent reduction in cellular protein and DNA synthesis in human osteoblast in vitro.[16] Further evidence implicating a direct effect of ethanol on osteoblast activity comes from studies examining circulating bone Gla protein (BGP, osteocalcin) level in alcoholic subjects.BGP is a small peptide synthesized by active osteoblasts ,a portion of which is released into the circulation.The consumption of 50 gm.ethanol (equivalent to four " shots" of scotch whiskey) over 45 min. results in a 30% decrease in serum BGP concentration that is detectable 2 hr. later.[17]

Several reports have also linked dietary calcium intake to levels of bone density in men,but the evidence is not yet conclusive.In a study of 222 subjects ,Kroger and Laitinen found men in the highest tertile of calcium intake (> 1200 mg/day) have higher proximal femoral BMD (but not spinal BMD) than those in the lowest tertile (< 800 mg/day).[18] However ,two other very large studies found no relation between calcium intake and hip fracture risk in men.[19-20] In general ,these evaluations of the relationship between calcium intake and hip fracture in men are suggestive of a beneficial effect but remain inconclusive.

In cross-sectional studies ,bone mass is greater in physically active men an effects that can be demonstrated at lumbar spine and femoral neck.[21-22] Finally, exercise has been strongly related to a reduction in hip fracture rates in men ,an effect that may also relate to a reduced risk of falls.[20,23] As in women, body weight itself is highly correlated with bone density in men.[24]

In this pilot study ,no any risk factors is associated to low bone mass due to small number of subjects.In conclusion,in Thailand up until the time of this report, there has no reliable data concerning prevalence of osteoporosis in men.The results of this study emerging recognition of the impact of osteoporosis in Thai men.Further study in large population is encoraged to determine actual prevalence and risk factors of osteoporosis in Thai men. Role of Thai health government in the prevention of osteoporosis is essentials because osteoporosis may be a huge problem in the future due to change in Thai life style and longer life time expectancy.

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