Prevalence of Osteoporosis of the Priests

Montchai Chumnumnawin MD*,
Sirichai Sawetchaikul MD*, Viriya Sresuriyasawad MD*

** Department of Orthopedics, Priest Hospital, Bangkok*

Objective: *To evaluate the prevalence of osteoporosis in priests*
Material and Method: *A cross sectional study was done in priests to evaluate the mineral bone density (BMD) measured by ultrasonography scanning at calcaneum in the out patients clinic of Priest Hospital and in the temples of central Bangkok. Questionnaire about related health behavior and past history of fracture including co-morbidity were reviewed.*
Result: *The BMD showed that 49.32% of the examined priests had osteopenia, 45.68% had normal BMD, and only 5.01% had osteoporosis.*
Conclusion: *Osteopenia and osteoporosis in the priests were correlated with aging, longer duration of being priests, domicile in rural areas, and inadequate duration of standing and walking activity per day.*

Keywords: *Osteoporosis, Osteopenia, BMD(Bone mineral density), Ultrasonography, Calcaneum, Priest.*

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Osteoporosis is an emerging public health problem affecting older population. The elderly population (above 35 years of age) worldwide in 2050 will increase from 323 million to 1,555 million[1]. Therefore, osteoporosis will increase proportionately. Osteoporosis most commonly affects the hip. It causes more hip fracture and causes higher healthcare costs. This affects both personal and societal perspective[2]. Osteoporosis is caused by decreasing bone mineral density (BMD)[2,3]. The decreasing synthesis starts after age 35-40. In the past, osteoporosis was thought to affect only women. However, in the last decade, it has become apparent that osteoporosis is common in men, particularly elderly men who take corticosteroid therapy for arthritis and asthma[2]. Major known risk factors are female sex, smoking, lack of exercise, under weight, drug, familial history and aging[4,5]. Minor risk factors are low intake of calcium, vitamin D, B_6 and B_{12}. Malnutrition, caffeine and alcohol consumption[2] also play a role in osteoporosis. A simple method to detect osteoporosis is by ultrasonography of calcaneum to measure BMD[5].The World Health Organization has defined osteoporosis as a BMD T-score value less than -2.5 SDs. These normative data[6] will be useful for predicting fracture risk of the priests. It was found that over 60 years old population have 20% prevalence of osteoporosis, which could be due to hormonal withdrawal[7]. Department of Orthopedics, Priest Hospital was interested in studying the prevalence of osteoporosis in the priests who have a different life style with less exercise and cannot select for their own food.

Correspondence to: Chumnumnawin M, Department of Orthopedics Priest Hospital, 445 Sri Ayudhya street, Bangkok 10400, Thailand. Phone: 0-2640-9537, Fax: 0-2354-4287.

Material and Method

The osteoporosis study was conducted between October 2005 and March 2006 on 659 priests older than 20 years old who came to the out-patients Department of Priest Hospital with other complaints beside osteoporosis. Some priests were randomly selected volunteers from 13 temples that had a high number of priests in central Bangkok. Interview using a questionnaire about the duration of being priest, location of living temple, exercise behavior, smoking, history of previous fracture, calcium supplement, and co-morbidity were conducted. Ultrasonography to measure BMD of calcaneum was done.

Results

Six hundred fifty nine priests were examined.

The age ranges were 20-45 years (38.85%), 56-65 years (22.15%), 46-55 years (21.09%), and more than 65 years (17.91%). For duration to be a priest, the group of being ordained longer than 10 years was the most common (45.68%) followed by 4-6 years (15.78%), 7-10 years (14.87%), 1-3 years (14.42%), and less than 1 year (9.26%). Their domicile were located in Bangkok Metropolitan and urban area (79.21%), rural area (20.03%), and on the hill or mountain (0.76%) as shown in Table 1.

For health behavior, it was known that the proper way for exercise of the priest is walking about with the bowl to receive food in the morning and clean the temple field in the afternoon or evening. The present study showed that average exercise between 30-60 minutes was the most common behavior (42.94%) followed by exercise longer than 60 minutes (35.36%) and less than 30 minutes (21.70%). For smoking, most of the priests were non-smokers or used to smoke and stopped (74.96%), 15.93% continue smoking less 10 cigarettes per day and 9.10% smoke more than 10 cigarettes per day. Most of the priests had no history of fracture (80.88%), never had calcium supplement (78.30%) and the rest (21.70%) had calcium supplement by drinking milk as shown in Table 2.

For previous disease or co-morbidity, half of the priests had some diseases (50.08%). The most common medical problem was hypertension (22.42%), followed by diabetes (18.48%) and cardiovascular disease (18.18%). Others were low back pain, allergy, and gouty arthritis as shown in Table 3.

Table 1. Demography of the priests who had mineral bone density examination by calcaneum ultrasonography

	Number	Percent
Age group (year)		
≤ 45	256	38.85
46-55	139	21.09
56-65	146	22.15
> 65	118	17.91
Duration of being priest		
Less than 1 year	61	9.26
1-3 years	95	14.42
4-6 years	104	15.78
7-10 years	98	14.87
More than 10 years	301	45.68
Domicile		
Bangkok and metropolitan	522	79.21
Rural provinces	132	20.03
Temple on the hill or mountain	5	0.76

Table 2. Related health behavior of the priests in osteoporosis study

Duration of walking in the morning and exercise		
Less than 30 minutes	143	21.70
30-60 minutes	283	42.94
More than 60 minutes	233	35.36
Smoking		
No smoking	494	74.96
Smoke 10 cigarettes per day or less	105	15.93
Smoke more than 10 cigarettes per day	60	9.10
History of previous fracture		
Never	533	80.88
Ever	126	19.12
History of calcium supplement		
Never	516	78.30
Ever	143	21.70

Table 3. History of previous diseases and co-morbidity of the priests

Absent	329	49.92
Present	330	50.08
Hypertension	74	22.42
Diabetes mellitus	61	18.48
Cardiovascular diseases	60	18.18
Low back pain	54	16.36
Allergic diseases	47	14.24
Gouty arthritis	21	6.36
Peptic ulcer and gastritis	20	6.06
Dyslipidemia	19	5.76
Asthmatic bronchitis	17	5.15
Pulmonary diseases	8	2.42
Thyrotoxicosis	8	2.42
Hemorrhoid	7	2.12
Sinusitis	7	2.12
Chronic renal failure	6	1.82
Benign prostatic hypertrophy	6	1.82
Tumor/cancer	6	1.82
Cataract	5	1.52
Migraine	4	1.21
Liver cirrhosis	3	0.91
Colitis	1	0.30
Tonsillitis	1	0.30
Juandice	1	0.30

Table 4. Correlation of age, duration of being priest, domicile, exercise, smoking, history of previous fracture, calcium supplement and co-morbidity with osteopenia and osteoporosis in the priests

Age range (years)	Normal bone density	Osteopenia	Osteoporosis	Total	X^2	df	p-value
Age ≤ 45	146 (57.00)	106 (41.40)	4 (1.60)	256 (100.00)	40.24***	6	
46-55	48 (34.50)	86 (61.90)	5 (3.60)	139 (100.00)			
56-65	69 (47.26)	69 (47.26)	8 (5.48)	146 (100.00)			
More than 65	38 (32.20)	64 (54.24)	16 (13.56)	118 (100.00)			
Being priest							
Less than 1 year	40 (65.60)	20 (32.80)	1 (1.60)	61 (100.00)	14.293*	8	0.074
1-3 years	39 (41.10)	51 (53.70)	5 (5.30)	95 (100.00)			
4-6 years	52 (50.00)	48 (46.20)	4 (3.80)	104 (100.00)			
7-10 years	42 (42.90)	52 (53.10)	4 (4.10)	98 (100.00)			
More than 10	128 (42.50)	154 (51.20)	19 (6.30)	301 (100.00)			
Domicile							
Bangkok metropolitan area and urban	256 (49.00)	247 (47.30)	19 (3.60)	522 (100.00)	19.868***	4	0.001
Rural area	42 (31.80)	76 (57.60)	14 (10.60)	132 (100.00)			
On the hill or mountain	3 (60.00)	2 (40.00)	0 (0.00)	5 (100.00)			
Excercise							
Less than 30 minutes	70 (49.00)	64 (44.80)	9 (6.30)	143 (100.00)	9.291*	4	0.054
30-60 minutes	142 (50.20)	130 (45.90)	11 (3.90)	283 (100.00)			
More than 30 minutes	89 (38.20)	131 (56.20)	13 (5.60)	233 (100.00)			
Smoking							
No or quit smoking	230 (65.60)	242 (32.80)	22 (1.60)	494 (100.00)	3.201*	4	0.525
10 cigarettes per day or less	49 (46.70)	49 (46.70)	7 (6.70)	105 (100.00)			
More than 10 cigarettes per day	22 (36.70)	34 (56.70)	4 (6.70)	60 (100.00)			
History of fracture							
Never	252 (47.30)	254 (47.70)	27 (5.10)	533 (100.00)	3.152*	2	0.207
Ever	49 (38.90)	71 (56.30)	6 (4.80)	126 (100.00)			
Calcium supplement							
Never	236 (45.70)	254 (49.20)	26 (5.00)	516 (100.00)	0.011	2	0.995
Ever	65 (45.50)	71 (49.70)	7 (4.90)	143 (100.00)			
Hypertension							
Absent	258 (44.10)	294 (50.30)	33 (5.60)	585 (100.00)	7.927***	2	0.019
Present	43 (58.10)	31 (41.90)	0 (0.00)	74 (100.00)			

Table 4. Correlation of age, duration of being priest, domicile, exercise, smoking, history of previous fracture, calcium supplement and co-morbidity with osteopenia and osteoporosis in the priests (cont.)

Age range (years)	Normal bone density	Osteopenia	Osteoporosis	Total	X^2	df	p-value
Diabetes mellitus							
Absent	273 (45.30)	300 (49.80)	30 (5.00)	603 (100.00)	0.537	2	0.765
Present	301 (45.70)	325 (49.30)	33 (5.00)	659 (100.00)			
Cardiovascular diseases							
Absent	275 (45.90)	292 (48.70)	32 (5.30)	599 (100.00)	1.983	2	0.371
Present	26 (43.30)	33 (55.00)	1 (1.70)	60 (100.00)			
Allergy							
Absent	279 (45.60)	303 (49.50)	30 (4.90)	612 (100.00)	0.270	2	0.874
Present	22 (46.80)	22 (46.80)	3 (6.40)	47 (100.00)			
Low back pain							
Absent	282 (46.60)	294 (48.60)	29 (4.80)	605 (100.00)	2.874	2	0.238
Present	19 (35.20)	31 (57.40)	4 (7.40)	54 (100.00)			

*** Statistical significant at 99 %
** Statistical significant at 95 %
* Statistical significant at 90 %

The result of calcaneum ultrasound scanning for bone mineral density evaluation showed that 49.32% had osteopenia (t-score between-2.5 and -1) followed by 45.68% of normal mineral bone density (t-score less than -1 or equal to 1) and only 5.01% had osteoporosis (t-score more than -2.5). For correlation study, osteopenia and osteoporosis are correlated with aging as shown in Table 4 and correlate with duration being a priest (6.30% prevalence in the priest longer than 10 years).

Discussion

Osteoporosis is not a rare disease and is associated with increased morbidity, mortality, and costs. One third of all the hip fractures occur in men. Osteoporosis can be detected by bone mineral density (BMD) measurement by ultrasonography at calcaneum. Due to increasing risk of fall in the elderly with osteoporosis, there is a question whether BMD measurement can predict fractures. BMD are inversely association with cardiovascular diseases[3]. Body balance dynamic exercise for 45 minutes, twice a week, is beneficial for reducing fall risk factors[9]. Population-based database for T-score calculation are still debated in terms of clinical and public health relevance[9]. Smoking is associated with a lower BMD and reduced cortical thickness in young men[10]. Corticosteroid therapy for arthritis or asthma and consumption of large amounts of alcohol are common cause of osteoporosis in elderly men taking corticosteroid therapy for arthritis or asthma[3]. Hypogonadism is considered one of the major risk factors for osteoporosis in men[14]. Routine analyses of blood, biochemistry, and x-ray should be performed on every priest newly diagnosed osteoporosis. For preventive measures, the role of dietary such as fruits and seafood, can positively affect BMD[12]. Foldi[13] started to educate the elderly men on calcium intake to prevent osteoporosis and found out that the VDO watching group increased the amount of calcium ingested than the other group. Mass media or educational material on calcium intake in elderly men could prevent priests at risk for osteoporosis. Bisphosphonate treatment reduces the risk of fractures and increases BMD. It was projected to be cost-effective under the assumption of the same fracture-risk-reducing effect[15]. In Thailand, it will cost 2,000 Baht ($57) per month or 24,000 Baht ($685) per year and require life-long treatment.

Conclusion

Every priest over 65 is identified as at-risk of osteoporosis and should undergo BMD testing for

screening. Geriatrists and internists should focus on this group due to their less chance to access to health care. Because there are no new treatment strategies for osteoporosis in men, prevention is very cost effective. The priests who are at risk of osteoporosis do not have sufficient knowledge of its consequence, so education, nutritional support, and physical activity should be encouraged.

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การศึกษาความชุกของโรคกระดูกพรุนของพระสงฆ์ไทย

มนต์ชัย ชุมนุมนาวิน, ศิริชัย เศวตชัยกุล, วิริยะ ศรีสุริยสวัสดิ์

วัตถุประสงค์: *เพื่อทำการศึกษาความชุกของโรคกระดูกพรุนในพระสงฆ์*
วัสดุและวิธีการ*: ทำการศึกษาแบบ cross section ทำการวัดมวลกระดูกพระสงฆ์โดยเครื่องอัลตร้าซาวด์ที่บริเวณกระดูกส้นเท้าในพระสงฆ์ไทยที่มารับบริการ ณ โรงพยาบาลสงฆ์ และวัดในเขตกรุงเทพมหานคร ร่วมกับการสำรวจด้วยแบบสอบถามเกี่ยวกับกิจวัตรประจำวันด้านสุขภาพ ประวัติที่เคยมีกระดูกหัก รวมทั้งการสำรวจโรคประจำตัว*
ผลการศึกษา*: จากการวัดความหนาแน่นมวลกระดูกและใช้เกณฑ์ตาม WHO พบว่า ร้อยละ 49.32 มีภาวะกระดูกบาง ร้อยละ 45.68 มีความหนาแน่นปกติ และร้อยละ 5.01 มีภาวะกระดูกพรุน*
สรุป*: ภาวะกระดูกบาง และโรคกระดูกพรุน มีความสัมพันธ์กับอายุ จำนวนพรรษาของการอุปสมบท การอยู่จำพรรษาในชนบท และการออกกำลังที่มีแรงกดทางดิ่งไม่เหมาะสม*