

摘要

骨質疏鬆症及因骨質疏鬆導致的骨折已成為全球公共衛生上之大問題，需要有效率的對策來預防及治療。本研究的目的是調查臺中縣和平鄉居民之骨質疏鬆盛行率並比較原住民及非原住民之間的差異。並分析運動，抽煙，飲食習慣，生產次數及維生素 D 受器(VDR)基因與骨質疏鬆症之相關性。

從 2001 年 7 月到 8 月間，共有 1638 位和平鄉居民(含男性 821 位，女性 817 位) 成為研究的個案。使用結構式問卷來記錄個案的基本資料：年齡，性別，抽煙，飲酒，飲食，運動，停經及生產狀況。骨密度測量是使用廣頻超音波骨密度測量儀(Broadband Ultrasonic Attenuation, BUA) 來測左跟骨之骨密度。基因型檢測是使用 PCR 及 BsmI 限制酵素來分辨維生素 D 受器基因型。

骨質疏鬆症在和平鄉男性之比例 (proportion) 為 11.4% (原住民：6.2%，非原住民:13.4%)，在女性為 28.4% (原住民：27.6%，非原住民:28.9%)。除了因年紀增加而導致之骨質流失外，在生產次數大於 3 次，體重小於 55 公斤，及從不飲酒之女性組別中其測出之 BUA 值較低。在男性組別中年齡的增加亦可發現骨質流失的情形但不呈線性之關係。男性每天抽煙一包以上可發現測出之 BUA 值較低，然而有飲用咖啡及酒者其測出之 BUA 值反而較高。在男女組別中皆可發現體重大者其 BUA 值高但在有飲用牛奶及有運動習慣者卻無此發現。VDR 基因型檢測顯示共有 6 位(1.5%)為 BB，17 位(4.3%)為 Bb，370 位(94.1%)為 bb。調整其它因素後，維生素 D 受器基因和骨質疏鬆症之相關性未達統計上之顯著差異。

許多研究皆指出每日飲用較多量的牛奶或鈣及維生素 D 補充物，負荷的運動能增加骨質密度。但在我們的研究中卻無此發現。可能的原因是研究個案之飲用牛奶或鈣及維生素 D 補充物，負荷的運動量不足所致。廣頻超音波骨密度測量值和年齡($p < 0.001$)，身體質量指數($p < 0.001$)，抽菸($p < 0.05$)及女性生產數($p < 0.001$)有顯著相關性。維生素 D 受器基因多型性無法預測骨質疏鬆症，可能與本研究之樣本數較小有關。

結論：本研究發現和平鄉居民骨質密度與年齡、身體質量指數、抽菸、男性之牛奶攝取量、女性生育次數有顯著統計相關，與生活型態之喝咖啡、喝酒、女性牛奶攝取量與運動情形之統計相關均不顯著。此外，本研究首次發現男性原住民沒有 B 對偶基因，而女性原住民沒有 BB 基因型，且維生素 D 受器基因多型性無法預測骨質疏鬆症。

關鍵詞：骨質疏鬆症、寬頻衰減值、原住民、維生素 D 受器基因

Abstract

Osteoporosis and osteoporotic fractures are major global public health problems, demanding effective strategies for prevention and treatment. This study is to find the prevalence of osteoporosis in Ho-Pin Village and the difference between aboriginal and non-aboriginal. Relationship of exercise, smoke, diet, frequency of childbirth and vitamin D receptor gene (VDRG) with osteoporosis was also analyzed.

From July 2001 to Aug 2001, 1638 residents in Ho-Pin township (male: 821, female: 817) were included in this study. Constructional questionnaire was used to record the demographic data: age, sex, smoke, alcoholic beverage, diet, exercise, menopause, and childbirth. Bone density of left heel was measured by QUS (Quantitative Ultrasound Bone Sonometry ,Mc Cue Ultrasonics, Winchester, UK). The genotype was based on the presence (*b*) or absence (*B*) of a *BsmI* restriction enzyme site in the VDRG.

The proportion of osteoporosis was 11.4% in male (aboriginal : 6.2%, non-aboriginal: 13.4%) 28.4% in female (aboriginal: 27.6%, non-aboriginal: 28.9%). Except the natural course of bone loss in aging progress, lower of BUA values were also found in the female group of childbirth more than three, body weight less than 55 kg, and never alcoholic drinking. The association of age effect is not linear but significantly with bone loss in male group. BUA values was lower in smoking more than one pack per day, whereas higher in alcoholic and coffee drinking of male group. BUA values was not increased by milk consumption and exercise, but in increasing body weight in both groups. There were 6(1.5%)BB homozygotes, 17(4.3%) Bb heterozygotes, and 370(94.1%) bb homozygotes. Adjusted for other factors,

there is no significant difference between VDRG with osteoporosis.

A higher daily milk consumption or calcium/ vitamin D supplements and weight-bearing exercise will increase bone mineral density was reported by many articles. There was no significant effect on BUA values with above factors in our study. Maybe the amount of milk, calcium/ vitamin D supplements consumption and duration, weight-bearing of exercise are not enough. BUA was significantly associated with age ($P<0.001$), BMI ($P<0.001$), smoking ($P<0.05$) in both sex, and childbirth in female group ($P<0.001$) in our study. Polymorphisms of the *BsmI* restriction enzyme site in the VDRG are not predictive of osteoporosis, may be due to small sample size of this study.

Conclusion: This study showed bone density of villager in Ho-Pin township was significant association with age, BMI, smoking, milk consumption in male, and childbirth in female; whereas coffee, alcoholic drinking, milk consumption in female, and exercise were not related. Moreover, there was no B allele in male aborigine, no BB genotype in female aborigine, and the polymorphisms of the BsmI restriction site in the VDRG are not predictive of osteoporosis in our study.

Key words: Osteoporosis, Broadband ultrasound attenuation value, aborigine, vitamin D receptor gene.