Epidemiological Study on the Bone Mineral Density of Inhabitants in Miyama Village, Wakayama Prefecture (Part I) Background of Study Population and Sampling Method

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ABSTRACT

This report describes details of the sampling method and background of the population selected for bone density measurements.

A list of inhabitants aged 40 to 79 years in Miyama Village, Wakayama Prefecture, was compiled based upon resident registration as of December, 1988. 1543 subjects consisting of 716 males and 827 females were identified. In order to measure bone density, a total of 400 subjects consisting of 200 males and 200 females were recruited from this list. Most were recruited from a centralized community and the remainder came from nearby areas, to give 50 people in each of eight age-sex groups. All of the selected people were contacted and agreed to participate. In Miyama Village, two large projects in relation to cancer and circulatory diseases are also being carried out as a part of national projects. As a consequence, various information such as clinical history, personal history, blood analysis and so forth could be obtained for subjects who underwent bone density measurements. From these data, it was found that the percentages for smokers, drinkers and hypertensive subjects were similar to those of other communities and also to those in a nationwide survey. Moreover, we observed no abnormalities in serum calcium and phosphorus levels referable to bone turnover.

These facts suggest that a representative sample population for measurements of bone density was drawn from the community.

Key Words

Epidemiology
Population-based study
Sampling method
Bone mineral density

Introduction

Accompanying the increasing proportion of elderly people in the population, osteoporosis and osteoporotic fractures in the elderly are becoming a major public health problem¹,². It has been known that fractures in the aged are attributable to bone loss with aging³. Although there is a lot of data about age-related bone loss on American and European subjects, such studies have been few in Japan.
Thus, in order to establish more precisely the age and sex pattern of bone loss, we have carried out bone density measurements in community populations by means of dual-energy X-ray absorptiometry.

It is most important to describe the selection and characteristics of the subjects examined. To this end, the background of the studied population and the method of sample collection for bone mass measurement are described here.

Methods of Study

1) Outline of the study village

The survey was carried out at Miyama Village in the middle of Wakayama Prefecture, which is on the Kii Peninsula, just south of Osaka (Figure 1). This village is located in a mountainous area, ranging in altitude from 150 to 1,269m above sea level.

Figure 1. Location of Miyama Village in Wakayama Prefecture.

According to the data of the national census taken in 1985, this village has 2,639 persons in 1,009 households living over a 168 Km² area. The main industries in this area are agriculture and forestry. Transportation in the past was mainly on foot or by bus which ran its route two or three times a day. However, recently modern roads have been built, so this village is now easily accessible and most households possess their own cars. Statistics indicate that Miyama Village had 229 automobiles per 1,000 persons in 1989, and ranked seventh among the 50 municipalities in Wakayama Prefecture.

Figure 2 shows the population pyramid of this village by age and sex, based on resident registration in 1989. As can be seen, there is a relatively high proportion of inhabitants aged 50 years and over. Figure 3 shows the populations above sixty-five years of age in Miyama Village and the whole of Japan from 1960 through 1989. In Miyama Village, this proportion has greatly increased from 7.7% in 1960 to 26.6% in 1989, and the percentage in 1989 was almost twice as high as that for the whole of Japan.

Figure 2. Population pyramid of Miyama Village, 1989.

Figure 3. Trends in proportions of persons aged 65 years and over in Miyama Village and all Japan.