STUDIES OF OSTEOPOROSIS IN URBAN RESIDENTS OF SÃO PAULO, BRAZIL, USING ISOTOPE RELATED TECHNIQUES

Part of Coordinated Program: COMPARATIVE INTERNATIONAL STUDIES OF OSTEOPOROSIS USING ISOTOPE RELATED TECHNIQUES.

Contracting Institute: School of Medicine (Faculdade de Medicina), Hospital das Clínicas, Laboratory of Human Nutrition and Metabolic Diseases (LIM/25), São Paulo, SP, Brazil.

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ABSTRACT

Brazilians as other communities are also predisposed to osteoporosis; eventhough the condition of diet may vary, the exposure to sun light all year long may introduce a factor of variability in the frequency and presentation of bone metabolic disturbances. Studies have already shown decreased incidence of hip fracture in the brazilian elders. Normal variation of bone mineral density has already been determined in selected groups of individuals in large cities, but without any reference to diet or exposure to sun.

The aim of this study is to evaluate bone mineral density as well as define the peak of bone mass in a normal urban population from 5 to 50 year old (90 females and 90 males), correlating these data with nutritional intake, sun exposure and physical activity.

As a complement to this project, bone biopsies will be taken from normal individuals who died in automobile accidents and elements like Ca, Zn, K, Na, Sr, Fe, Cl will be evaluated.
1. SCIENTIFIC BACKGROUND AND SCOPE OF THE PROJECT

Osteoporosis has only recently been shown to be an important health problem in Brazil. Eventhough the Unit of Metabolic Bone Diseases of Hospital das Clinicas of Sao Paulo, has been studying problems related to bone physiology and physiopathology, the epidemiology and economic consequences of osteoporosis are being studied only recently. In the city of Sao Paulo a melting pot of many races and brazilians from all over the country, this epidemiological study of osteoporosis has the difficulty of the mixed samples but at the same time allows one, with some defined criteria to choose a representative sample of the urban population in this country.

As a complement to this study bone composition as well as the determination of some elements as Ca, Zn, K, Na, Sr, Fe, Cl will help to characterize deviations from normal which could help to understand the metabolic abnormalities found in osteoporosis.

The scope of this project is the definition of normal standards for bone density and the peak of bone mass as well as bone composition which has been a major obstacle preventing meaningful epidemiologic research projects in various regions of the country. The result of this study will help to develop plans to decrease the impact of osteoporosis as an important social and economic problem in our country.

The Unit of Metabolic Bone Disease of the Hospital das Clinicas (University of Sao Paulo) is presently developing the following projects:

a- Bone mineral density in children from 5 to 15 years;
b- Bone and body composition in malnutrition;
c- Senile osteoporosis: evaluation of bone mineral density after a laboratory oriented therapy;
d- Post menopause osteoporosis: response to HRT;
e- Effect of exercise on bone mass in senile osteoporosis;
f- Human growth hormone effect on senile osteoporosis;
g- Hyperthyroidism and osteoporosis;
h- Alendronate treatment of osteoporosis - a multicenter study under the direction of Merck Sharp & Dohme.
METHODS

Commencing in November 1994 and extending for four years. The subjects will be chosen from communities which are currently under Governamental Health Program of the Department of Preventive Medicine. These communities are regularly visited by the governamental officials. Subjects from 15 to 50 years old will be distributed in 5 year groups, each group will have 15 individuals of each sex. A questionnaire (under development) will help to characterize the normal group and will help to separate those individuals with known factors which could interfere on bone metabolism as chronic intake of medicine such as steroids, contraceptives, thyroxin, anticonvulsivants, underlying diseases such as diabetes mellitus, liver diseases, kidney diseases, etc.

LABORATORY METHODS

Two Hologic densitometers will be used (1000 W DPX and a 4500 W). The bone density measurements will include lumbar spine anterior-posterior and proximal femur and whole body. Included individuals whose bone mineral density were out from the expected normal range will be more thoroughly studied before entering the group of normals.

PLANS FOR FUTURE WORK

Besides the evaluation of normal bone density measurements as proposed, arrange have been made with the Dr. Mitiko Saiki from the Radiochemical Division of the Institute of Nuclear and Energetic Research (IPEN-CNEN/SP) to study chemical determinations of mineral and trace elements in normal and osteoporotic bones. We have already been able to measure Zn, Fe, Sr as well as Ca, Cl, K, Na and have started measuring at of trace elements. The plan is to measure those bone components in normal and eventually on osteoporotic individuals.