

Prevention of Osteoporosis and Promotion of Bone Mass in Asian Populations using a Food-based Approach (RAS/6/041)

Objectives

To evaluate the effectiveness of food-based dietary intervention programmes by using nuclear and isotopic techniques to promote bone mass and prevent bone loss especially in the postmenopausal women. The long-term goal is to identify the effective strategy in prevention of osteoporosis and promotion of bone mass in high-risk populations in Asia.

Background

Osteoporosis is a skeletal disease characterized by low density and general deterioration of bone tissue. Bone fragility induces fractures that represent the major clinical aspect of the disease. Osteoporosis has become one of the major public health problems around the world attributable to the ageing populations.

Although osteoporosis cannot be cured, its progression can be slowed, and actions should be taken to help and prevent the disease. Dual-energy X-ray absorptiometry (DEXA), a nuclear-related method, is a bone mineral density (BMD) test and it is a safe, accurate, quick, painless, and non-invasive way to diagnose osteoporosis, to detect low bone density, to monitor the effectiveness of treatments, to predict the risk for future fractures and to suggest the preventive course of action. Neutron activation analysis (NAA) and isotope techniques can also be used to assess calcium content and bioavailability from the indigenous diet, and the effect of calcium-rich products on BMD.

The implementation plan entails evaluation of calcium bioavailability from indigenous foods and enriched food products by using in vivo stable isotopic technique and a 2-year dietary intervention programme to improve bone health in the elderly women including postmenopausal women.

This project will build on the completed 5-year coordinated research project (CRP) on comparative international studies of osteoporosis using isotope techniques. The Agency has developed harmonized protocols and applications of nuclear techniques for evaluation of BMD. The project would transfer the technology to harmonize the approach of BMD measurements. Additionally, alliances have been formed in Asian countries to look into the prevention and care of osteoporosis, namely, The Asian Pacific Osteoporosis Foundation, and The Asian Osteoporosis Study (a multi-center study for osteoporosis research with countries such as China, Malaysia, the Philippines, Singapore and Thailand).

As a result of this activity, regional infrastructure will be developed for addressing bone health of the elderly, counterpart collaborators will be trained in harmonized protocols for evaluating bioavailability of calcium from local foods and enriched food products, and for assessing BMD status. All these will be useful to identify appropriate food-based supplementation strategies to promote bone health in the region as a whole.

The counterparts of this regional project are the Chinese University of Hong-Kong (China); Indraprastha Apollo Hospital (India); Universtiy Kebangsaan (Malaysia); Food and Nutrition Research Institute (Philippines); Singapore General Hospital (Singapore); and Faculty of Medicine, Mahidol University (Thailand).

National Commitment

The participating countries will designate Project Coordinators and assign local resources and facilities to carry out the activities in the project.

Outcomes

1. Trained staff in harmonized protocols for evaluating bioavailability of calcium from local foods and enriched food products, including protocols for measuring BMD.
2. Indigenous foods and enriched food products high in calcium identified

Performance Indicators for Outcomes

- 1a. Adoption of harmonized protocols for the evaluation of bioavailability of calcium from local foods and enriched food products as well as protocols for measuring BMD by participating RCA countries before the end of the project
- 1b. At least one person from each participating Member State trained in application of the protocols before the end of the project.
- 2a. Development of menus high in calcium based on indigenous calcium-rich foods and calcium-enriched products within two years after the completion of the project.
- 2b. At least one marketable calcium rich food products developed in five of the participating Member States within three years after the completion of the project.

Expected Project Impact

The expected social and economic impact will be realized when the project results and recommendations at the end of the proposed study are incorporated into the National Health Care Policy and Food and Nutrition Policy for the reduction of osteoporosis-related diseases among elderly in the Member States. This will help reduce healthcare expenditures; promote health and well being of elderly as a result of improved bone health in the populations; and encourage the use of calcium rich indigenous foods and fortified foods products as vehicles to provide adequate calcium and vitamin D to the vulnerable populations.