

Studies made with diverse wetland soils showed that ammonium produced under submerged conditions was significantly correlated to organic carbon and reducible Fe (extracted by ammonium oxalate or EDTA solution). It was concluded that organic matter and reducible Fe controlled the release of ammonium in wetland soils where Fe was abundant<sup>12</sup>. It was found that soils rich in both organic carbon and reducible Fe were high in mineralizable N. On the other hand, soils low in organic matter or reducible Fe had lower content of mineralizable N released under submerged conditions<sup>12</sup>.

Thus Fe fertilization of Fe-poor oceans will increase the supply of reducible Fe in the ocean which in turn will influence the oxidation of organic carbon and ammonium production, the key process

that controls the nitrogen supply to flora and fauna in wetland soils, sediments and oceans.

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## Prevention of chronic complications of diabetes mellitus – Does patient education score over treatment?

Diabetes mellitus (DM) has become a common disease that leads to chronic complications like neuropathy, nephropathy, vascular diseases (cardiac, cerebral and peripheral) and retinopathy. World Diabetes Day is celebrated every year on 14 November, which is incidentally the birthday of Frederick Banting, who together with Charles Best discovered insulin in the year 1921. This year's theme of World Diabetes Day was to address retinopathy, one of the complications of DM: 'Your Eyes and Diabetes: Don't Lose Sight of the Risks'.

There is significant rise in the incidence of DM in India. Development of chronic complications is related to the number of years of DM. This is particularly alarming in developing countries like India where life expectancy is increasing rapidly<sup>1</sup>. By the year 2025 India is predicted to have the largest number of people with DM in the world<sup>2</sup>. Many pharmaceutical companies consider India as the 'diabetes capital' of the world. This leads to multiple problems faced by the health personnel, like difficulties

in diagnosis and proper management. The total burden of DM is due to two factors:

- (1) The number of new cases is increasing due to inherited risk, change in life style (sedentary lifestyle, abnormal eating habits, etc.) and increase in lifespan (increase in age has a higher risk factor for developing DM).
- (2) DM patients are living longer because of better treatment modalities, thus preventing acute complications and premature deaths. Because of these impacts there is an increased DM population at a higher risk of developing chronic diabetic complications.

The chronic complications of DM translate into a significant economic burden on the individual and the community because the treatment is expensive. The country may have to pay a heavy price if efforts are not made to improve awareness levels by conducting frequent DM education programmes to general populations, specially to high-risk groups and

DM patients. In Mysore, Apoorva Diabetes Foundation (ADF) is conducting awareness camps for the last three years for small groups of 100 to 300 people. During 9–10 November 2002, ADF organized a diabetes exhibition to commemorate World Diabetes Day. It was designed as a three-tier system. The first tier included lectures and interactive sessions. In the second tier, traffic zone concept of diet was presented. Foods to be avoided were displayed in the red zone, foods to be restricted were displayed in the yellow zone and freely consumable foods were displayed in the green zone. The third tier included the facilities available to lead a quality life for DM patients (various companies displayed their products like insulin devices, glucometers, footwear for DM patients and specially formulated food products like sweet substitutes and low-calorie foods).

The response from the general public was overwhelming both in number and quality of interaction. It was an eye-opener to the doctors who took part in

the interactive sessions about the level of awareness regarding diabetes in the general public. Still a large section of the population is confused regarding diabetes complications, proper diet and medication. Many a time the medication regime crosses over suddenly with the other alternate medicines popularly practised in India like ayurveda, homeopathy, etc. What is needed now is to fine-tune this awareness among the general public and to expand this type of awareness programme to rural areas.

Certain currently available drugs for DM patients are expensive. The high cost is because of importing biotechnology products. Reduction of the cost of diabe-

tes drugs, especially insulin, depends on the instrument technology and biotechnology. An active strategy has to be framed to start indigenous biotechnology products to overcome this. It is unanimously accepted that treatment and management of DM is not possible with doctors or drugs alone. Patient cooperation and awareness are equally important in monitoring DM and its complications; this can be created by frequent diabetes education programmes. Finally, health personnel, health institutions and the government should work in unison to take up the epidemic of diabetes as a serious problem and to launch a national programme on diabetes prevention and treatment.

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## NEWS

# Application of nuclear techniques in the prevention of degenerative diseases (obesity and non-insulin dependent diseases) in ageing\*

Non-communicable diseases (NCDs) account for nearly 60% of deaths globally mostly due to heart diseases, strokes, diabetes mellitus, cancer and lung diseases. The rapid rise of NCDs represents one of the major health challenges to global development in the 21st century, and threatens economic and social development as well as the health of millions of individuals. Dramatic increases in NCD incidence is occurring in developing countries, particularly those in the process of rapid economic transition such as India, China and Brazil. In 1998, of the total number of deaths attributable to NCDs, 77% occurred in developing countries and of the disease burden they

represent, 85% was borne by low- and middle-income countries. This increase in the incidence of chronic degenerative diseases with ageing is due to a complex range of factors, both genetic and environmental, and includes their complex interactions which seem to determine the nature and course of this epidemic of degenerative diseases. When industrialization and economic development occur, there are substantial changes in dietary habits and lifestyle. These then affect health status and life expectancy. Along with the dramatic changes in diets and food consumption patterns, there are profound changes in habitual daily patterns of activity with increasingly sedentary lifestyles that are associated with increasing risk of weight gain and obesity, which predispose to other chronic degenerative diseases. Obesity carries an increased risk of a higher incidence of chronic degenerative diseases such as diabetes mellitus, cardiovascular disease (CVD) and cancer. Mortality and morbidity appear to differ with differences in the distribution of body fat; with the higher risk linked to excessive abdominal fat or

central obesity, which in turn is related to a number of these chronic diseases.

In the developed countries, research using nuclear and isotopic techniques has been used extensively to examine the physiological and biochemical mechanisms involved in obesity-related diseases. In 1999, the International Atomic Energy Agency (IAEA) initiated the current Co-ordinated Research Project (CRP) with the principal objective to promote the use of these nuclear and isotopic techniques in the developing world to investigate the problem of chronic degenerative diseases associated with ageing and with increase in obesity in these countries. The developing countries participating are Brazil, Chile, China, Cuba, India, Jamaica, Mexico and Nigeria, all of which were undergoing developmental transition with dramatic changes in dietary consumption patterns and changes in lifestyles. New Zealand and the ethnic populations both within and around were another important group studied.

The principal objectives of this CRP involving ten countries both in the North

\*Report on the IAEA Coordinated Research Project on Aging, based on a workshop held at Bangalore. Principal Investigators (countries in alphabetical order): 1. Brazil: Ana Lydia Sawaya; 2. Chile: Eric Diaz; 3. China: Gausheng Ma, Yanping Li; 4. Cuba: Manuel Hernandez; 5. India: Chittaranjan Yajnik, Anura Kurupad; 6. Jamaica: Terrence Forrester; 7. Mexico: Mauro Valencia; 8. New Zealand: Elaine Rush and 9. Nigeria: Adeyemo and Eme Owoaje.