

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.

and the South are: to define the magnitude of the problem, specifically of obesity and non-insulin-dependent diabetes mellitus (NIDDM) in several developing countries, to identify the vulnerable groups at increased risk, and to attempt to describe the metabolic and physiological mechanisms underlying this phenomenon. This CRP was thus set up with the following specific objectives:

- To promote the use of stable isotopic techniques to investigate the determinants of obesity and NIDDM in the identified countries.
- To identify the vulnerable groups at increased risk and to attempt to describe the metabolic and physiological mechanisms underlying this phenomenon.
- To enhance North–South collaboration and transfer of know-how and technology.

The important contributions of this CRP project can be broadly classified as (i) those that relate to validation of several

methodologies relevant to the various studies conducted in these countries using nuclear/isotopic techniques, and (ii) those that relate to the various associations of the measured parameters with the risk factors identified as being contributory or associated with these diseases. The common themes that emerged from this CRP project over the period of four years are: (i) The harmonization of methods and validation during the initial stages of this CRP has allowed conclusions to be drawn using data from many studies. (ii) The importance of environmental changes that accompany transition in societies (epidemiological, developmental, economic, socio-demographic and nutrition) which lead to a risk transition increasing risk of NCDs. Among these are rural-to-urban migration, variations in socio-economic status, etc. (iii) The differences noted in the different country studies may be attributed to different stages in this transition that different countries are currently at, while at the same time highlighting the

dual burden of under- and over-nutrition and their interactions that are evident in these societies in transition. They may also include differences due to differences in dietary intake and physical activity and their differential effects on risk.

These studies in several developing countries highlighted the role of dietary intake including variations in quantity, composition and quality of the diet and the relationship between body composition and physical activity patterns, while supporting our understanding of the conventional proximate and immediate risk factors. Some of the country studies which followed up the cohort showed an increase in risk factors and in disease manifestation over time along with changes in diet and in physical activity patterns, thus supporting the view that life-course events alter the risk of NCDs.

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MEETING REPORT

Symposium on electrets

The 11th International Symposium on Electrets (ISE 11) was held at Melbourne in Australia from 1 to 3 October 2002. The meeting was attended by 120 participants from all over the world. Among the 23 countries which were represented, the largest number of papers came from Japan, Germany, France and China. Portugal and India had five papers each. The Netherlands, Russia, Australia, USA and many others had less than five papers. The ISE 11 had technical sessions on injection, transport and trapping of charge, polarization; piezo-, pyro- and ferroelectric phenomena; molecular electrets and composite or novel materials; thermally-stimulated processes, radiation and field effects; ferroelectric ceramics, thin films, bioelectrets and applications. In all, 103 papers were presented. A workshop entitled 'Space Charge Profile Measurements – Practice, Problems and Potential' was organized on 4 October 2002.

The term 'electret' was coined by a Japanese physicist M. Eguchi in 1920s as an electric counterpart of magnet. Electret is a dielectric material containing a quasi-permanent electric charge trapped inside. The electret effect, first discovered in Carnauba wax obtained from a palm tree of Brazil, has come a long way with the introduction of polymers. The study of electret phenomena in polymers, their blends, polymer–ceramic composites and hybrid piezoelectric polymer films on micro-machined silicon dioxide layers have generated much interest and research activity in the past few years.

In the very first invited paper, J. van Turnhout (The Netherlands) described new approaches and a two-step method for the analysis of thermally stimulated currents, to find distribution of charge trapping states in polymer blends. In another paper G. M. Sessler (Germany) from Darmstadt University of Technol-

ogy presented a comparison of radiation-induced conductivity (RIC) and generation recombination (GR) models of charge transport in electron beam irradiated polymer electrets. J. Lewiner (France) has made important contributions in the space charge profiling for characterization of electrical behaviour in insulators. He with his group explored the possibility of applying this technique to semiconductors as well.

An invited paper by R. Gerhard-Multhaupt (Germany) on challenges in cellular and polymer foam electrets, covered a study of their nonlinear piezoelectric behaviour, thermal and temporal stability of charge as well as highlighted new application areas. Cellular polymer electret materials show quasi-ferroelectric behaviour and will remain the focus of research for next several years in development of devices such as electromechanical transducers, thermo-