

**CONFERENCE ON
HEALTHY CHILDHOOD FOR HEALTHY ADULTHOOD:
ROLE OF NUTRITION**

ILSI-India and ILSI Research Foundation sponsored a Conference on Healthy Childhood for Healthy Adulthood: Role of Nutrition on December 15, 2006. It was co-sponsored by National Institute of Nutrition, Hyderabad. Around 80 participants from academia, government departments, medical colleges and hospitals, industry and UNICEF, UN World Food Program, CARE, and FAO participated in the Conference. The Conference was addressed by 18 experts.

The welcome address was delivered by Dr Sesikeran, Director, NIN. He mentioned that he was happy to be associating with ILSI in organizing the Conference. He emphasized the importance of appropriate nutrition during childhood and emphasized that maximum benefit can be obtained through intervention programs during pre natal and early period of childhood. .He said that health of mother is an important determinant of health of a person from infancy to adulthood. .Mr D H Pai Panandiker introduced the theme of the Conference. He pointed out that more children in India are suffering from micronutrient malnutrition than anywhere else in the world. About 75% of children suffer from iron deficiency; 6.6 million, iodine deficiency; 57% vitamin A deficiency, 26% zinc deficiency and about 50000 are deficient in folic acid (neural tube birth defects). In India 6,600, 000 children are born mentally impaired. The annual GDP loss due to deficiencies of iron, iodine, zinc, vitamin A and PEM are about 4.45%. He said that as against children with morbidity in early childhood those with no reported morbidity retained their health advantage in adulthood.

The key note address was delivered by Prof. M. Indra Shekar Rao, Professor and Head, Department of Pediatrics, Gandhi medical College; Additional Director, Medical Education, Government of Andhra Pradesh and Vice Chairman Indian Academy of Pediatrics, Adolescent Chapter. He said that optimal nutrition during fetal development and infancy is crucial for healthy adulthood. Balanced nutrition is crucial window for promotion of optimal growth, health, behavior development, intellectual performance, work capacity, reproductive outcomes and overall healthy adulthood. There is epidemiological proof about association between fetal malnutrition and morbidity and mortality in adult life; low birth weight and small size at birth is followed by accelerated weight gains fro 3-11 years is predictive of HTN, CHD and Type 2 diabetes. Dr Rao also talked about role of fatty acids in neurodevelopment and role of micronutrients in promoting good health and association between malnutrition and infections e.g. PEM predisposes children to measles, diahorrea and pneumonia. He expressed concern at growing incidence of overweight and obesity in India as a result of lack of physical activity and faulty diets. Dr Rao said that malnutrition sets in very early in India due to delayed initiation of breast feeding and inappropriate and delayed complementary feeding. He expressed regret that there is lack of nutrition security for children and as a

result 47% of children below 3 are underweight; 30% are born with low birth weight, 37%-39% of men and women have chronic energy deficiency and the record on micronutrient front is quite poor. He recommended that nutrition education should be made a part of school curriculum and for adults there should be counseling at family level, community level and country level.

Vote of thanks was delivered by Ms Rekha Sinha, Executive Director, ILSI-India. In her observations she informed the participants about ILSI-India's activities in the area of nutrition and physical activity and said that ILSI-India is already devoting attention to preparing educational materials on nutrition and physical activity based on Take 10 and Power Kids programs of ILSI RF and ILSI SEA respectively.

The Conference discussed the following topics: nutrition and child development and behavior; nutrition during pregnancy and childhood and its impact on early childhood; nutrients that are vital for early life; complementary feeding; nutrigenetics and nutrigenomics, nutrition in childhood and repercussions on growth and immunity, long term effects of iron deficiency in early childhood, malnutrition in childhood and its repercussions on chronic diseases in adulthood, adolescent nutrition: Gujarat experience; knowledge management in food and nutrition security and health for all. The following points emerged from presentations made by experts and observations made by the participants:

Findings and Recommendations

Undernutrition, Growth and Development

- **India has a disproportionate burden of development challenge- 35% of LBW and 40% of the malnourished of the developing world.**
- **The level of under nutrition, age of onset, severity and age of rehabilitation can influence brain development and function. The long-term consequences of severe under nutrition beginning in the womb have adverse repercussions on growth resulting in stunting and in poor cognitive and behavioral development that continue into adulthood.**
- **nutritional rickets has made an unexpected comeback across the globe. Emerging research on early vitamin D deficiency has shown it to be associated with an increased risk of insulin resistance, diabetes, tuberculosis, and asthma in later life. Additionally, calcium intakes have also been associated with the etiology of rickets.**
- **The interaction between nutrition and infection, known as “infection complex” is the most important public health problem today. Repeated episodes of infections impair nutritional status and poor nutritional status impairs immunity.**

- Investing in maternal and childhood nutrition will have both short - and long-term benefits of huge economic and social significance by way of: reduced health care costs throughout the life cycle; increased educability and intellectual capacity, and increased adult productivity.

Maternal Nutrition Impacts Foetal Outcome

- Optimal pre-pregnancy nutrition, lowers the risk of birth defects, as, the embryo is particularly vulnerable during the first few weeks when organs are formed.
- Energy is the major nutrient determinant of gestational weight gain. If the weight gain is low, there is an increased risk of intrauterine growth retardation (IUGR)
- Lack of sufficient nutrients can interfere with foetal brain and other organ development. *Hence these need to be provided through food or supplements*
- Key nutrients impacting quality of life during pregnancy, lactation and early childhood are proteins, iron, vitamin a, iodine, b vitamins, folic acid, zinc, osteonutrients (calcium, magnesium, phosphorous and vitamin d).

Higher Investment on Intervention Programs

- Developing intervention programmes that provide nutritional supplementation as well as intellectual stimulation especially during the early years of growth and development is important. Evidence shows that these programs have a beneficial effect on care behaviors of mothers, and nutrition status, mental functions, and school achievement of children. Benefits lasting through adulthood indicate lower behavioral problems and better earning capacities of those who as children participated in such programs.
- Nutritional status of children in a community depends on pattern of infection as much as dietary intake. This means any intervention program directed at improving the nutritional status of a community must take into account local disease pattern.
- Indian population is in bad shape in terms of nutrition because health and within that nutrition attracts less attention and allocation of resources.
- Under the adolescent anemia control program initiated in some districts in Gujarat state in India under the guidance of UNICEF iron and folic acid supplements given to adolescent girls have led to decline in anemia level from 75% to 53 %.

- The intervention programs of CARE India started with a standard interventions package which included early and exclusive breastfeeding, appropriate complementary feeding (timely initiation, frequency, quantity, quality, responsiveness, feeding during/after illness) and Vitamin A supplementation have shown good results.
- There is inadequate coverage of children and women under the supplementation program. There should be higher coverage of national programs to improve nutritional status,

Complementary Feeding

- The World Health Organization's (WHO, 2001) goal for complementary feeding is "to improve complementary foods and feeding practices by ensuring sound and culture-specific nutrition counseling to mothers of young children, recommending the widest possible use of indigenous nutrient rich foodstuffs." However, achieving a diet that is nutritionally adequate is difficult when/if plant-based foods predominate during the complementary feeding period (Dewey, 2003).
- The challenges to complementary feeding in India are: growth faltering not detected by regular weighing; cultural ceremonies delaying introduction of semi solid food, low literacy level of mothers, no service contact from health sector after DPT3 till Measles immunization (4 to 9 months) unless baby falls sick .Further, 6-9 months age period is a crucial window of opportunity that is missed always, as prevalence of malnutrition jumps 3 times between six month to1st birth day of many babies.
- The solutions to overcome challenges to promote complementary food are: a.)develop culturally acceptable, low cost, balanced and locally available complementary foods-1.) modified family food 2.)Instant Infant food from roasted cereal, dhal, oil seeds b.) have service providers at the village level and train them in counseling skills. c.) undertake massive Behaviour Change Communication
- Iron and zinc have important functional roles that impact growth, cognitive and psychomotor development, and immune function (Black 2004; Krebs 2006; Zlotkin, 2004). It is estimated that a nine month old breast fed child needs over 90% of both the iron and zinc requirements to come from complementary foods, which are generally low in iron and zinc.

Food Based Approaches

- In spite of increase in agricultural production, per capita availability of many items including green leafy vegetables have not increased. People who have enough purchasing power to consume enough fruits and vegetables don't do

so due to attitudinal problems or lack of awareness. Fruits and vegetables should be made more accessible by reducing their prices.

- **Functional foods have a role in improving health status.**

Fortified Foods

- **Fortification of culturally appropriate foods isn't a new concept, but is one way to help address these "problem" nutrients in early life and, for vegetarians, fortification or supplementation becomes critical**
- **Industry should devote attention to making fortified processed foods available at low price to consumers including consumers in rural areas. Public Distribution System (PDS) should distribute fortified foods in rural areas also.**
- **Government should increase expenditure on health care to benefit masses. There should be accountability for program coordinators.**
- **Proactively advocate for policy leverage for :Universal fortification of ICDS food and mid day meal schemes; universal wheat flour fortification; provisioning for fortified wheat flour and iodized salt / DFS through**
- **A highly effective source of iron in food is ferric sodium EDTA. Compared to other iron compounds that are used in food fortification, ferric sodium EDTA enables the highest level of absorption, particularly in phytate-rich diets. Therefore WHO recommends ferric sodium EDTA as the iron fortificant of choice for high-extraction wheat flours e.g. atta flour. A huge 18-months lasting field trial in China with soy sauce fortified with ferric sodium EDTA has shown that the incidence of anemia is reduced by more than 50% at an average intake level as low as 5 mg/d Fe as ferric sodium EDTA. Separate data were collected for the age group of 3 to 6 years. The average daily dosage for these infants must have been lower than that for the adults, nevertheless a significant effect on iron status was observed underpinning the high effectiveness of this iron fortificant for small infants as well. It is estimated that for these infants a daily dosage of 3 to 4 mg/d of Fe as ferric sodium EDTA would be desired.**
- **Initiate dialogue with food industry for multiple food fortification**
- **Position nutrition concerns as Corporate Social Responsibility**

Nutrigenetics and Nutrigenomics

- **Gene nutrient interactions in insulin dependant diabetes are also of great interest and merits consideration. Evidences indicate that certain genotypes**

of insulin dependant diabetes are related to food exposure in infancy and later in adulthood resulting in immune destruction of beta cell of pancreas. Exclusive breast-feeding for six months induces tolerance and protects against cow's milk and meat induced damage.

- Bioactive compounds can alter metabolic insults. Omega 3 fatty acids and their enriched food products impact chronic inflammatory processes. Turmeric and curcumin have several target molecules that appears to be useful for food based approaches for prevention of chronic diseases, particularly cancer and degenerative diseases. The expectations for the 21st century with the genomic and technological advances are identification of specific genes, expansion of nutrigenomics and phamcogenomics and predicting the responses to bio molecules to design functional foods for promotion of health and well being.
- There cannot be one single dietary guideline for all geno types.
- Different diets are required for different geno types.
- Industry should work with others to update dietary guidelines.

Education and Communication

- It is important to give nutrition and health education about breast feeding, complementary foods, fortified foods and encourage consumption of green leafy vegetables.
- Multipronged approach is required to tackle malnutrition problems.
- Educate policy makers, health and nutrition workers and provide IEC aid.
- Labeling should be used for nutrition education and better food choices.
- Work out innovative channels for communication and education.
- Celebrity should be roped in to impart nutrition education
- Private public partnership should be forged even in nutrition education.
- Effectively use *phone-in programs* offered by 'Gyan-Vani' and 'Gyan Darshan' channels of IGNOU
- Develop *Maternal and Child Health Help-Lines* at Tertiary Hospitals and Colleges of Home-Science

Screening for Health Indicators

- Children and parents should be screened for health indicators.

Think Tank

- **A Think Tank should be established to address issues.**

Self Help Groups

- **There should be self help groups.**