

## EDITORIAL

## MICRONUTRIENTS IN HEALTH AND DISEASE

Nutrition has been expressed as a right in international human rights instruments since 1924, and has been confirmed through numerous declarations and conventions(1). Good nutrition is not only the key to the healthy development of individuals, families and societies, but evidence is available indicating that improving the nutrition of the most vulnerable groups in the community, will contribute positively to some of the greatest health challenges facing the world, including the burden of chronic and degenerative diseases, maternal mortality, malaria and HIV/AIDS.

Originally, global nutritional concerns were dominated by vitamin deficiencies; however, the focus changed with time, and currently the concern is on both macro- and micronutrient deficiencies. Since the 1990s, there has been growing interest globally, on micronutrient deficiencies, mainly iodine, iron and vitamin A(2).

Micronutrients are vitamins and minerals, essential for human growth and functioning. They are also nutrients needed in very small amounts, initially recognised as primary agents for preventing disorders such as blindness. Over the past two decades, however, important new knowledge about the problem of micronutrients has emerged where these nutrients are now known to save the lives of mothers and children, to stimulate mental development, protect against infectious diseases and improve adult capacity for work(3). In 1990 at the World Summit for Children, world leaders endorsed the "Declaration on Children" and targeted the year 2000 for both virtual elimination of vitamin A deficiency and iodine deficiency and one third reduction in the number of women afflicted with iron deficiency. The declaration was in recognition of various facts including that vitamin A treatment for measles reduced case fatality by up to one half, that severely iron deficient pregnant women are more susceptible to death and that iodine deficiency significantly increases stillbirths and infant deaths(4).

Vitamin A deficiency is the single most important cause of blindness in developing countries and also makes children very vulnerable to infections as well as influencing the outcome of various infections. Supplementation reduces the risk of the child's death by 23%. More recently evidence from various studies is accumulating on the value of micronutrient supplementation in improving the course of HIV infection as well as in reduction of mother-to-child transmission of HIV. Supplementation trials conducted among HIV-infected children suggest potential benefits of vitamin A during HIV-1 infection including reducing the occurrence of diarrhoeal-related morbidity and mortality(5). However, despite various interventions, over 100 million pre-school children suffer from vitamin A deficiency the world over.

Zinc deficiency in malnourished children is known to be the cause of growth failure and susceptibility to infections. There is, however, no reliable method of determining its prevalence. It is thought to be common in children and during pregnancy throughout developing countries and may have wide-ranging diverse consequences(6). Evidence is, however, accumulating that Zinc deficiency is associated with difficulties in pregnancy and child birth, compromised immune responses and increased risk of infectious disease as well as retardation of linear growth, thus contributing to stunting.

Iron deficiency anaemia still remains the most common deficiency in the world affecting 3.5 billion people in developing world(7) including 40-50% of children and 50% of pregnant women. HIV infected pregnant women require special attention and follow up to reduce the risk of maternal death and adverse pregnancy outcome from effects of anaemia(8). The disorder impairs immunity and reduces the physical and mental capacity of populations. Iron deficiency anaemia in infants may impair brain development while in pregnancy it is an important cause of maternal mortality.

Iodine deficiency is the single most important cause of preventable brain damage and mental retardation. The global campaign to iodise all edible salt is reducing the risk associated with the deficiency reducing the numbers of those threatened from 1.6 billion in 1992 to 43 million suffering from varying levels of brain damage, eleven million cretins and 760 million people with goitre(9). It is clear that more public health interventions are needed to combat these disorders.

As sub-Saharan Africa continued to fight the rising poverty levels that threatened to reverse nutritional gains made in the 1980s and early 1990s, a bigger challenge was born. The Joint United Nations Programme on HIV/AIDS (UNAIDS) continues to provide alarming estimates of adults and children currently infected with the human immunodeficiency virus (HIV). Sub-Saharan Africa carries 75% of this burden estimated at 36 million adults worldwide and more than two million children. This disease is now the number one overall cause of death in Africa and fourth in the world according to the world health report(10). The importance of nutrition in AIDS has long been recognised and evidence is accumulating that micronutrient deficiencies influence transmission of the virus. Studies in industrialised nations indicate low serum concentrations of vitamin A, B<sub>6</sub>, B<sub>12</sub>, C, E, folate, carotenoids, selenium, zinc and magnesium(11). Several studies in developing countries such as the study on genital shedding of HIV type 1 during pregnancy and the finding of severe vitamin A deficiency suggest that micronutrient supplementation may be beneficial(12). There is also an increasing body of

research evidence indicating the beneficial role of multiple micronutrient supplementation to pregnant women in the reduction of mother-to-child transmission of HIV.

Despite the increasing knowledge on the benefits of micronutrient in health and disease, the public health challenge is in the delivery of services to the communities affected given the declining quality of health services, rising poverty, rising prevalence of HIV/AIDS and reduced food production. The micronutrients mentioned in this communication are those where enough information is available on their public health importance. However, other micronutrients are also relevant and need to be considered in various clinical settings, especially in developing countries where multiple deficiencies occur and in food emergency situations where specific nutrient needs may not be addressed adequately.

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