Global Micronutrient Deficiencies in Childhood and Impact on Growth and Survival: Challenges and Opportunities

Aamer Imdad and Zulfiqar A. Bhutta

Despite numerous advances and improvements in child health, malnutrition still remains as one of the main public health challenges of the 21st century, particularly in developing countries. Micronutrient deficiencies are associated with general malnutrition, and among these, vitamin A, iron, zinc and iodine deficiencies are the most prevalent in childhood – an estimated 1 million child deaths and 9% of global childhood disability-adjusted life years are attributed to vitamin A and zinc deficiency [1]. The purpose of this chapter was to summarize the current knowledge on micronutrient deficiencies and their role in reducing morbidity and mortality during childhood. Vitamin A deficiency impairs numerous body functions, and can lead to many adverse health consequences including xerophthalmia, infectious morbidity, mortality, growth failure and anemia. According to the latest report of the WHO, globally about 190 million preschool-aged children and 19.1 million pregnant women are vitamin A deficient. WHO recommends two annual high-dose supplements of vitamin A for every child at risk of vitamin A deficiency. Since 1998, large vitamin A supplementation programs are in place in about 193 UNICEF-targeted countries to deliver the required dose of vitamin A. While there is encouraging progress in coverage of vitamin A, significant gaps remain and continue to undermine children’s health (fig. 1). An effort should be made to improve the current strategies of vitamin A delivery to achieve at least 80% coverage on persistent basis [2]. Zinc is an important element and plays a critical role in cellular growth, cellular differentiation and metabolism, and in turn promotes immunity, resistance to infection and the growth and development of the nervous system. It reduces the severity of acute diarrhea when supplemented with low-osmolarity oral rehydration solution. A recent estimate has shown that
20% of the world’s population is at risk of low zinc intakes. Figure 2 shows that only 46 countries have adopted zinc policy as part of their national child health policy [3]. It is therefore required to scale up the zinc supplementation, and it should be incorporated into national diarrhea management policy. Iodine deficiency is the primary cause of preventable mental retardation, and also increases the chance of infant mortality, miscarriage and stillbirth. According to an estimate, about 2 billion people have insufficient iodine intake around the globe, and about 31.5% of school-age children have insufficient iodine intake. Salt iodization is one of the exemplary success stories of food fortification offering great benefits for the intellectual health of nations [4]. Thirty-four developing countries have achieved the universal salt iodization goal, and an additional 38 countries are considered ‘on track’ for elimination of iodine deficiency disorders [4]. Despite this progress, many countries are lagging far behind. Twenty-four countries have experienced no growth in coverage rates or have even experienced a decline since the mid-1990s. In order to achieve universal salt iodization, country level legislation should be done, and adequate funds should be ensured to enforce it [4]. Iron is an essential mineral for human development and function. Globally, about 1.62 billion people are anemic,
with the highest prevalence in preschool-age children (47%) and the second highest in pregnant women (42%). Ensuring sufficient iron levels in the early years of life is critical, and can be achieved through iron supplementation in the form multiple micronutrients (Sprinkles, etc.) [5].

In conclusion, micronutrients like vitamin A, zinc, iodine and iron are important for growth and survival of children. Given the wide prevalence of multiple micronutrient deficiencies in malnourished children in developing countries, the challenge is to implement intervention strategies that combine appropriate infant and young child feeding with micronutrient interventions at scale.

**References**

