Prevention control and impact of deficiency in vitamins in general public health.

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Introduction

The WHO estimates that about 2 billion individuals worldwide are at risk of micronutrient deficiencies (vitamins, minerals, and trace elements). Approximately 125 million preschool children are vitamin A deficient, with sub-populations at risk of folate, thiamin, vitamin B12, niacin, other B vitamins, and vitamin D deficiencies.

Significant impact of Vitamin deficiencies

Vitamin inadequacies have a greater impact on women's health and reproductive results than previously thought. Similarly, according to socioeconomic strata, the societal burden of vitamin deficiency health repercussions is disproportionately borne by women, adolescents, and children. Vitamin deficits can influence the immune systems, rates of infectious diseases, intellectual development, physical development, and growth of infants and young children as they grow rapidly. The aged, as a group, are frequently at risk [1].

It is becoming increasingly obvious that there are linkages between vitamin deficiencies and chronic diseases, particularly deficiencies in obese people and those with limited bioavailability, which are not often recognised clinically. Vitamin deficiencies contribute to the global burden of disease, economic losses, and limited national development on a greater scale, however the overall influence of vitamins is unknown and likely minimal. Nonetheless, it has been estimated that the load of micronutrients in general, using the 2 billion figures, puts 40–60% of children in the 6-24 month age group in LMICs at risk of poor development.

Population at risk and scope of the problem

Around 2000 million individuals are thought to be suffering from micronutrient malnutrition (vitamin and trace element deficiencies). Multiple micronutrient deficiencies are more common than single deficiencies, especially in women in low- and middle-income countries around the world. Vitamin A deficiency affects 190 million (1 in 3) preschool children, folate deficiency affects 15-49% of pre-fortification children, and vitamin D deficiency is a global problem affecting up to 1 billion people, according to current estimates, with less clear or localised estimates for Vitamin B12, thiamin, other B vitamins, and Vitamin E [2].

Other, less common vitamin deficiencies have been reported, but only in specific situations, such as refugee camps and those on restricted diets: an outbreak of beriberi among African Union troops in Mogadishu, Somalia, who were living on restricted rations, was quickly treated with thiamin supplementation. While some other B vitamin deficiencies are frequent in LMICs, they are rarely life-threatening (except thiamin deficiency in some circumstances).

Vitamin B12 deficiency is sometimes underestimated, although it has been regarded as "a major public health problem worldwide," with rates as high as 40% in Latin America, 70% in Africa, and 70–80% in South Asia. Vitamin B12 deficiency, according to the authors of a recent analysis, increases the risk of neglected tropical disease infections, and the presence of such illnesses can lead to Vitamin B12 deficiency. Vitamin B12's public health impact is probably certainly underestimated, given its link to a higher risk of unfavourable pregnancy outcomes and impaired psychomotor and cognitive development, as well as its function in the health of the elderly.

Thiamin insufficiency is another public health issue that isn't getting the attention it deserves in several LMICs. Infant mortality has been linked to thiamin insufficiency, which can also have long-term neurodevelopmental implications. Thiamin deficiency (as measured by low blood thiamin levels) is common in various Southeast Asian nations, including Cambodia (70-100% of babies and 27-100% of reproductive-age women), Laos (13% of hospitalised infants), and Thailand (16-25% of children and 30% of old adults) [3]. Thiamin deficiency is responsible for up to 45% of mortality among Cambodian children under the age of five, 34% of baby deaths in Laos, and 17% of infant deaths in Myanmar.

Nonetheless, the vitamins that cause the most worry in terms of public health are Vitamin A, folate, and, more recently, Vitamin B12 and Vitamin D. Iron, zinc, calcium, selenium, and maybe magnesium are minerals and trace elements of worldwide public health importance, although they are not covered further here. The inaccuracy of the prevalence numbers for vitamin deficiencies reflects the difficulties in estimating the scope of the problem.

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Preventive and control measures to be taken

Sustainable programmes and approaches are becoming increasingly important, not least because bilateral and UN support for many nutrition interventions, particularly for single-vitamin deficits, is dwindling. Higher food diversity, as well as improved living conditions and, hence, diets and healthful environments, would be ideal. A complicating factor is that vulnerable children's diets frequently lack vitamin A and other essential vitamins. Diets in LMICs are regarded as monotonous, with little nutritional variety and insufficient vitamin content: for example, vitamin A in animal-source foods is physically lot more available, but it is also considerably more expensive.

Cheaper diets, which primarily consist of dark green leafy vegetables and some fruits that provide beta-carotene (a Vitamin A precursor), are significantly less effective in terms of vitamin A activity (about 12–21 times less physiologically accessible) [4]. Concurrent viral disorders, which diminish appetites (and hence micronutrient content in the reduced diet), increase vitamin use, and increase vitamin excretion, exacerbate the situation. In most circumstances, a combination of the four strategies listed below is most effective, and they should be used simultaneously, adapted to the local situation and people.

Dietary quality and diversity

The use of citrus fruits and other Vitamin C–containing fruits and vegetables to prevent and treat the scourge of scurvy at sea is one of the most well-known examples of dietary factors: a deficiency disease that is said to have killed more people at sea than storms, shipwrecks, combat, and all other diseases combined. Scurvy, which was often associated with pellagra and beriberi, was the most feared peril at sea. Food-based initiatives are more likely to be sustainable in the long run since they generally draw on existing traditions and culture.

Increased production and consumption of foods high in accessible micronutrients through agriculture and horticulture, small animal production or aquaculture, and, increasingly, but still restricted, bio fortification are among the techniques to enhance diets in resource-poor conditions. When correctly constructed, Social and Behavioural Change Communication (SBCC) promotes cultural acceptability, aids programme economic viability, and add to programme sustainability [5]. Food storage, processing, germination, cooking methods, and strategic food combinations have all been demonstrated to have a rather big, detectable impact on micronutrient retention and bioavailability of plant foods.

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